

International Roaming BEREC Benchmark Data Report April 2021 – September 2021

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1. Structure of the Report

The International Roaming BEREC Benchmark Report (the “Report”) contains four parts and three annexes. Chapter 2 is an **Introduction** to the Body of European Regulators for Electronic Communications (BEREC) Report and describes BEREC’s work on roaming based on the Roaming Regulation (EU) No. 531/2012, as amended by Regulation (EU) No. 2120/2015¹ and by Regulation (EU) No. 2017/920² (hereinafter “Roaming Regulation”). The key findings of this Report are included in the third Chapter, **Main findings**. The fourth Chapter **Charts** presents the latest available data on the domestic mobile market and international roaming mobile market. **Annex I: Methodology for the data collection** provides a detailed description of the methodology for the current data collection. **Annex II: Regulatory evolution** outlines regulatory measures taken to reduce price levels for roaming services within the EU. **Annex III: List of respondents** includes the list of operators that provided data for this Report. The Report is accompanied by a spreadsheet file enabling an easy and open access to the data included in the Report (published together with the Report) and additional roaming data for the user.

2. Introduction

The Report presents the results of the 28th round of data collection on European international roaming services undertaken by BEREC. The Report covers the period 1 April 2021 – 30 September 2021, i.e. the 2nd quarter of 2021 and 3rd quarter of 2021. The Report also includes data from previous rounds of data collection. The structure of this report was reviewed and changed already in the 24th report by removing or consolidating various figures, thus making the document better readable. However, more roaming data is still included in the .xls file, published as well on the BEREC website. The earliest data in this report is from the 3rd quarter 2014.³ BEREC has also collected data on connected objects/devices and its related traffic/revenues at retail and wholesale level since the 26th data collection. Despite the fact that many operators in the EEA countries faced technical difficulties to provide information (especially on wholesale level), BEREC analysed the information gathered and presented results in this Report. It should be noted that the charts on connected objects/devices should be taken into account with caution as data is still not quite comprehensive in the third data collection.

The applicable regulatory framework for this data collection is the Roaming Regulation, applied in the European Union (EU),⁴ which includes new requirements for the retail and wholesale regulated tariffs for voice, SMS and data roaming.

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 Roaming Data has been collected since the 2nd quarter 2007. Data prior to the 3rd quarter 2014 are available in previous BEREC reports.

⁴ The amendments are incorporated in the EEA agreement and are therefore applicable in the three EEA/EFTA states Iceland, Liechtenstein and Norway.

The assessment of the international roaming market should be 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 is tasked with regularly collecting 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 as well as 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, on 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 coordinates 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 a single and commonly agreed upon data collection model is used for the process of data collection, and the process is synchronised 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.

3. Main findings

Over 160 providers of international roaming services provided information for this Report. This number includes virtually all of the mobile network operators in the EEA countries, 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 the EEA.

Retail domestic prices (ARRPU) for mobile services

BEREC tried to analyse the retail domestic prices and found that it is hard to disaggregate the different mobile communications services (voice, SMS and data) 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 find 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 average retail revenue per user (ARRPU) for mobile communications. 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. In spite of the limitations and lack of common methodology mentioned above, BEREC has calculated the ARRPU but notes that the results of it should be interpreted with caution. For this calculation BEREC used the data relative to mobile domestic services submitted by operators.⁵ The domestic monthly ARRPU for Q2 2021 varies considerably between the countries, ranging from 3.44 Euros per month to 29.24 Euros per month, with a weighted EEA average of 9.77 Euros (Figure 1). The Report shows similar outcomes for Q3 2021: the ARRPU ranged from 3.51 Euros to 30.00 Euros per month, with a weighted EEA average of 9.90 Euros (Figure 1). BEREC would like to note the caveat that the disproportion between individual ARRPU could also be caused by different methodologies used by operators to allocate the revenues between mobile communication services and non-mobile communication services.

Intra-EEA roaming consumption patterns

The BEREC data for this Report demonstrates partial recovery of the roaming market from the Covid-19 pandemic during Q2 2021 and Q3 2021. The ratio of roaming subscribers has increased since the respective quarters of 2020 but it is still less than the prior-pandemic tendency, which is reflected in this Report (Figure 12). The tendency is similar for the volumes of the roaming calls made (Figure 16). For data roaming traffic, the volumes are higher than the pre-pandemic period (Figure 33) but roaming data traffic is also impacted by the general trend of increased data consumption (at the domestic level as well).

When addressing variations in Intra-EEA roaming consumption patterns, the Brexit process should be taken into account. As, on the one hand, since Q4 2019 roaming out traffic concerning the customers of the UK operators was no longer included in the benchmark, and on the other hand, since Q1 2021 the roaming concerning the UK operators (at wholesale level) and UK subscribers (at retail level) was no longer considered by the EEA operators in the “EEA” category but in the ‘Rest of World’ (RoW) category instead⁶.

Rest of the World (RoW) roaming retail prices

With regard to the ‘Rest of World’ retail voice roaming calls made by EEA customers (Figure 34), the EEA average RoW tariff for calls made was 17.90 Euro cents in Q2 2021 and 23.14 Euro cents in Q3 2021. Receiving calls when roaming outside the EEA area cost 7.29 Euro cents in Q2 2021 and 9.65 Euro cents in Q3 2021. At the same time, data from the operators reveals that the average price for data consumption outside the EEA amounted to 7.75 Euro per GB in Q2 2021 and 8.06 Euro per GB in Q3 2021.

⁵ The monthly ARRPU was calculated per country by dividing retail revenues (i.e. total revenues related to mobile voice, SMS and data traffic, excluding any other type of revenue, such as those originating from mobile devices, subscription fees to services etc.) in the respective quarters by the total number of domestic and roaming subscribers per country within the same period and dividing the result by 3 to arrive at a monthly value.

⁶ Due to reporting system issues experienced by some operators not all UK data could be removed from the “EEA” category in Q1 2021.

Wholesale roaming rates

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

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

Service at wholesale level (no VAT)	Q2 2021		Q3 2021	
	Price Cap	EEA Average	Price Cap	EEA Average
Wholesale voice (€/minute)	3.2	1.91	3.2	1.97
Wholesale SMS (€/SMS)	1	0.28	1	0.28
Wholesale data (€/GB ⁷)	3	1.35	3	1.39

Wholesale roaming rates for outgoing calls

At the wholesale level (Figure 13), the EEA average price was 1.91 Euro cents in Q2 2021 and increased to 1.97 Euro cents in Q3 2021 compared to a cap of 3.2 Euro cents. A reduction in the average EEA wholesale prices for intra-EEA roaming voice calls since 2017 (Figure 13) is observed. The EEA average wholesale price for balanced traffic was 2.05 Euro cents in Q2 2021 and declined to 2.00 Euro cents in Q3 2021. Meanwhile, payments for unbalanced traffic in the EEA averaged at 1.77 Euro cents in Q2 2021 and decreased to 1.74 Euro cents in Q3 2021.

Wholesale roaming rates for SMS

At the wholesale level, a reduced average EEA price for roaming SMS (Figure 20) of 0.28 Euro cents in Q2 2021 and 0.28 in Q3 2021 is observed compared to a cap of 1 Euro cents respectively. The average price for balanced traffic was 0.32 Euro cents in Q2 2021 and 0.34 Euro cents in Q3 2021 and the average price for unbalanced traffic was 0.24 Euro cents in Q2 2021 and 0.23 Euro cents in Q3 2021.

Wholesale roaming rates for data

At the wholesale level, the data cap applying in the EEA was 3 Euro per GB in Q2 2021 and Q3 2021. The EEA average price for wholesale data services decreased to 1.35 Euro per GB Q2 2021, compared to 1.74 Euro in Q2 2020 (Figure 25). The EEA average price for wholesale data services in Q3 2021 fell to 1.39 Euro per GB, compared to 1.60 Euro in Q3 2020 (Figure 26). In the context of the wholesale inbound roaming prices, the EEA average price for balanced traffic was 1.40 Euro per GB in Q2 2021 and 1.34 Euro per GB in Q3 2021, whereas the EEA average price for unbalanced traffic was 1.23 Euro per GB in Q2 2021 and 1.43 Euro per GB in Q3 2021 (Figure 23 and Figure 24).

⁷ 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.

Wholesale roaming agreements (Article 3)

Only some operators submitted data on wholesale agreements based on Article 3 of the Roaming Regulation. BEREC's Opinion on the functioning of the Roaming Regulation⁸ showed that depending on the type of MVNO (full or light MVNO), MVNOs use different ways for accessing wholesale roaming services. The preferred option is to use wholesale resale access from the domestic host MNO, 30% of the full MVNOs make use of resale access from other domestic MNOs, and only a few MVNOs use access via a hub or have bilateral agreements with the foreign MNOs. The wholesale prices that MVNOs pay are higher than the total average wholesale rates analysed in the previous four paragraphs and stay close to the cap prices of the Roaming Regulation (Figure 35 and Figure 36 and Figure 37).

How wholesale costs and prices relate to each other

In the table below, BEREC presents the cost estimates for wholesale roaming services per country. The estimation of the unit cost per service is based on the Axon Consultants cost model.⁹ However, apart from the Axon model's output per country¹⁰/per service, the unit costs included in the tables below include also an estimation for transit costs (for voice and data services) and an estimation of voice termination costs (for voice service). The Axon study does not provide one single result for each type of service, country and year, but provides 72 scenarios (e. g. for Austria the model calculates 72 different unit costs for roaming voice service for 2021 depending on the combination of parameters/methodological approaches under which the model is run). Therefore, in the tables below, the range of the cost estimates are presented.¹¹

⁸ https://bereg.europa.eu/eng/document_register/subject_matter/bereg/opinions/8595-bereg-opinion-on-the-functioning-of-the-roaming-market-as-input-to-ec-evaluation

⁹ <https://ec.europa.eu/digital-single-market/en/news/finalisation-mobile-cost-model-roaming-and-delegated-act-single-eu-wide-mobile-voice-call>.

¹⁰ Please note that the model developed for EC by Axon Consultants does not calculate unit costs for Luxembourg, Iceland and Liechtenstein because the NRAs/operators of these three countries did not provide the required data

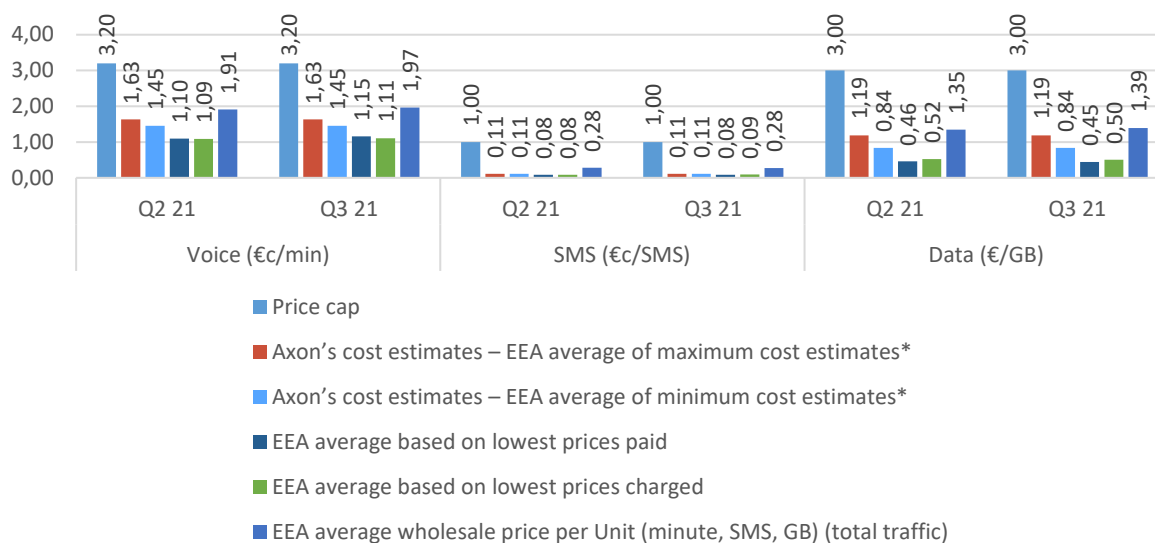
¹¹ Except for SMS services for which there is insignificant differentiation between the various scenarios for which only the max cost estimate is presented.

Wholesale roaming services cost estimates (in €cents/unit/GB) in each of the 28 countries for 2021¹²

	voice min	voice max	SMS max	data min	data max
AT	1.37	1.73	0.13	0.50	0.77
BE	1.52	1.78	0.15	1.10	1.93
BG	1.35	1.47	0.04	0.57	0.81
CY	1.38	1.46	0.06	0.65	1.02
CZ	1.54	1.61	0.15	1.10	1.37
DE	1.47	1.85	0.09	0.77	0.96
DK	1.37	1.49	0.08	0.57	0.70
EE	1.44	1.46	0.28	0.61	0.75
EL	1.34	1.36	0.13	0.51	0.63
ES	1.40	1.62	0.07	0.96	1.63
FI	1.62	1.92	0.06	1.33	1.60
FR	1.41	1.63	0.08	1.17	1.42
HR	1.51	1.82	0.11	1.27	2.06
HU	1.36	1.51	0.04	0.81	1.40
IE	1.42	1.50	0.05	0.82	1.11
IT	1.38	1.63	0.27	0.52	0.73
LT	1.41	1.48	0.05	0.59	0.86
LV	1.99	2.43	0.27	1.44	2.00
MT	1.46	1.55	0.07	1.00	1.51
NL	1.51	1.65	0.13	0.99	1.54
PL	1.33	1.36	0.09	0.51	0.62
PT	1.39	1.54	0.06	0.72	1.07
RO	1.33	1.46	0.07	0.56	0.74
SE	1.44	1.65	0.05	0.76	0.97
SI	1.55	1.66	0.19	0.76	0.98
SK	1.44	1.60	0.05	0.98	1.72
UK	1.44	1.67	0.06	0.78	1.10
NO	1.52	1.70	0.10	1.03	1.19
Average	1.45	1.63	0.11	0.84	1.19

¹² These cost estimates include: 1) the total wholesale roaming costs in MS estimated by Axon (including network costs, roaming-specific costs and the impact of seasonality on roaming costs); 2) an estimation for the termination rate that the visited network operator needs to pay the terminating network operator for terminating a call on its network (only for voice) and 3) an estimation 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 (only for voice and data services). More information on the approach that BEREC follows to estimate the unit costs can be found in BEREC's document BoR (19) 168.

BEREC compared the lowest wholesale prices for the unbalanced traffic in Q2 2021 and Q3 2021 against the estimated unit costs for 2021.¹³



The evidence from the estimates of the EEA wholesale rates for the outgoing calls and data services shows that the EEA average of the maximum unit cost estimates for 2021 are lower than but close to the EEA average wholesale prices. The EEA average wholesale rate for SMS services is around three times the EEA average of Axon's unit cost estimates.

Further information on unit cost estimates can be found in the BEREC supplementary analysis on wholesale roaming costs.¹⁴

MNOs and MVNOs¹⁵

For both quarters (Q2 21 and Q3 21), roaming consumption was, in general, lower for MVNOs' subscribers than for those of MNOs (Figure 42, Figure 43, Figure 44 and Figure 45). It is also worth noting that payments made by MVNOs to the host operators for wholesale roaming services are in general higher than the average wholesale prices (Figure 46).

¹³ Prices are calculated from the lowest unbalanced rates submitted by the operators and expressed as simple average.

* These cost estimates include: 1) the total wholesale roaming costs in MS estimated by Axon (including network costs, roaming-specific costs and the impact of seasonality on roaming costs); 2) an estimation for the termination rate that the visited network operator needs to pay the terminating network operator for terminating a call on its network (only for voice) and 3) an estimation 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 (only for voice and data services).

¹⁴ BoR (19) 168 BEREC supplementary analysis on wholesale roaming costs is available at: https://berec.europa.eu/eng/document_register/subject_matter/berec/opinions/8756-berec-supplementary-analysis-on-wholesale-roaming-costs

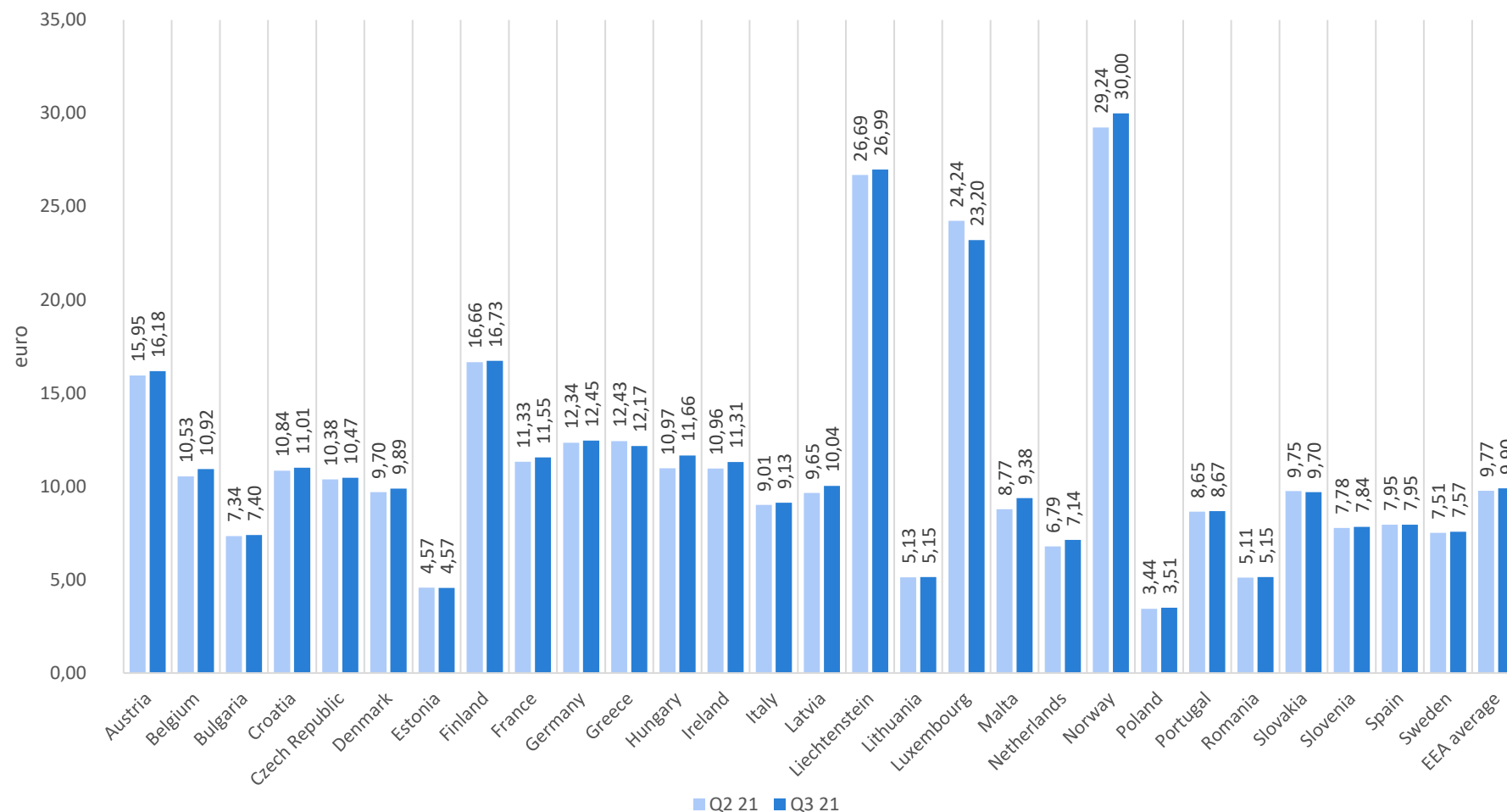
¹⁵ In some cases the data for MVNOs is incomplete so the figures presented are more of an indicative nature.

4. Charts

4.1. Analysis of subscribers and those that use roaming services

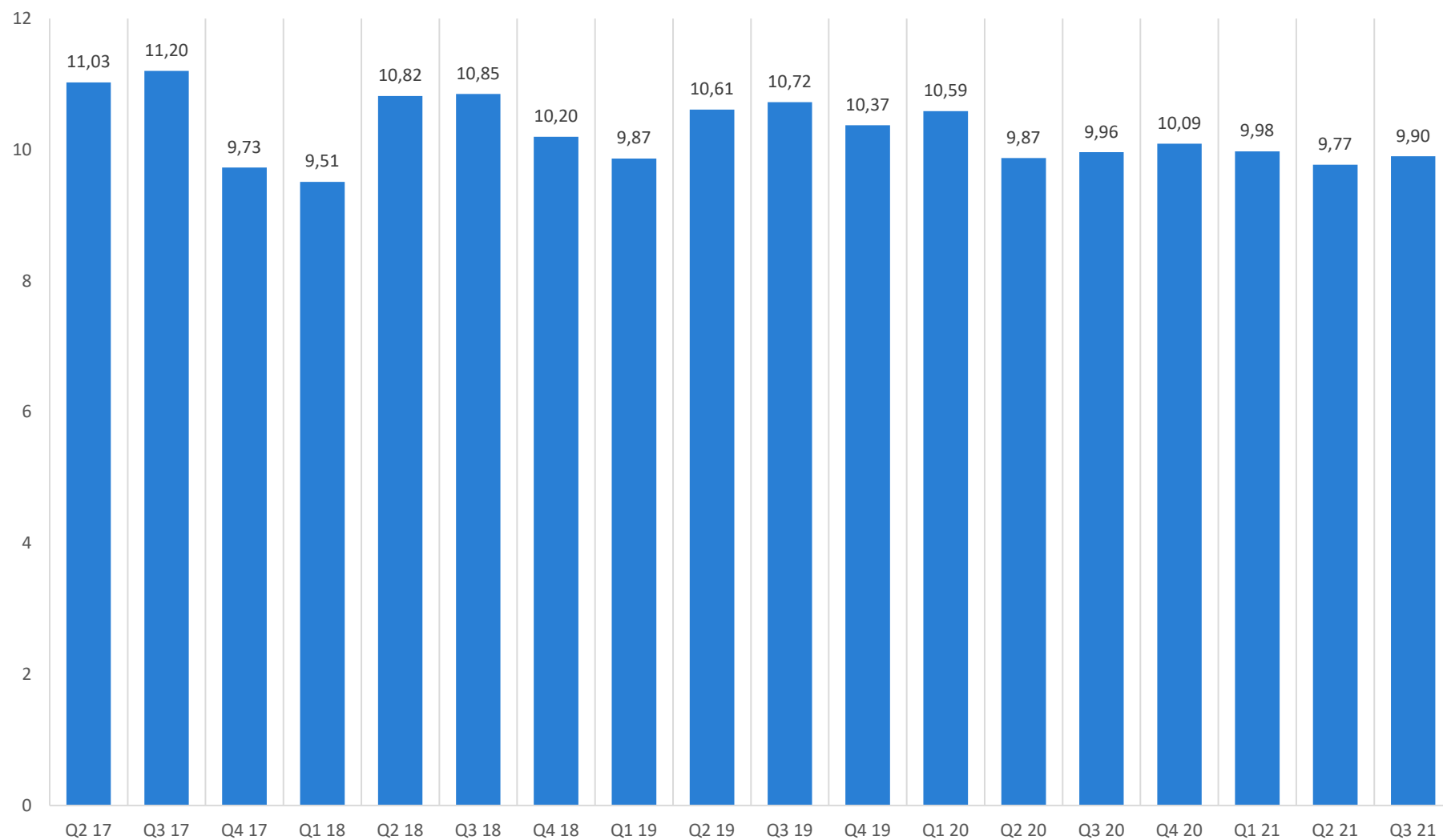
4.1.1. Domestic average Retail Mobile Revenue per User (ARRPU)

Figure 1: Domestic mobile service: monthly retail revenue per total number of subscribers (ARRPU), Q2 21 and Q3 21



EEA average excludes: Cyprus - revenues from several operators were not disclosed due to the fact that they have not been audited.
In some cases, not all operators provided the data for subscribers.

Figure 2: EEA average: domestic mobile service: monthly retail revenue per total number of subscribers (ARRPU), Q2 17 – Q3 21



The EEA average includes United Kingdom operators' data until Q3 2019.

This Report contains corrections for the 24th and 25th data collection rounds (Q2 19 – Q1 20).

4.1.2. Consumption patterns for domestic mobile retail services

Figure 3: Domestic calls made: average number of minutes per month per total number of subscribers, Q2 21 and Q3 21

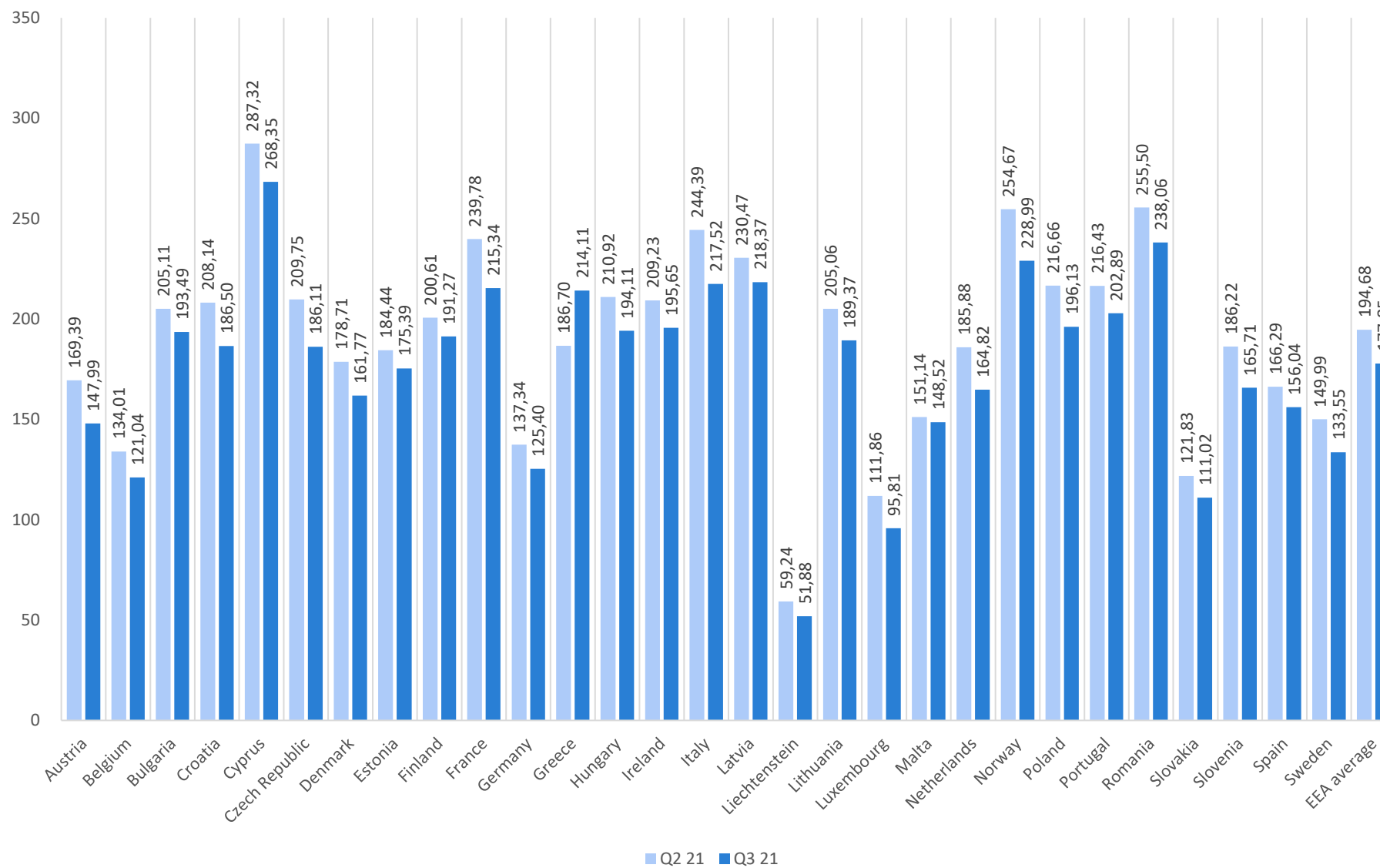
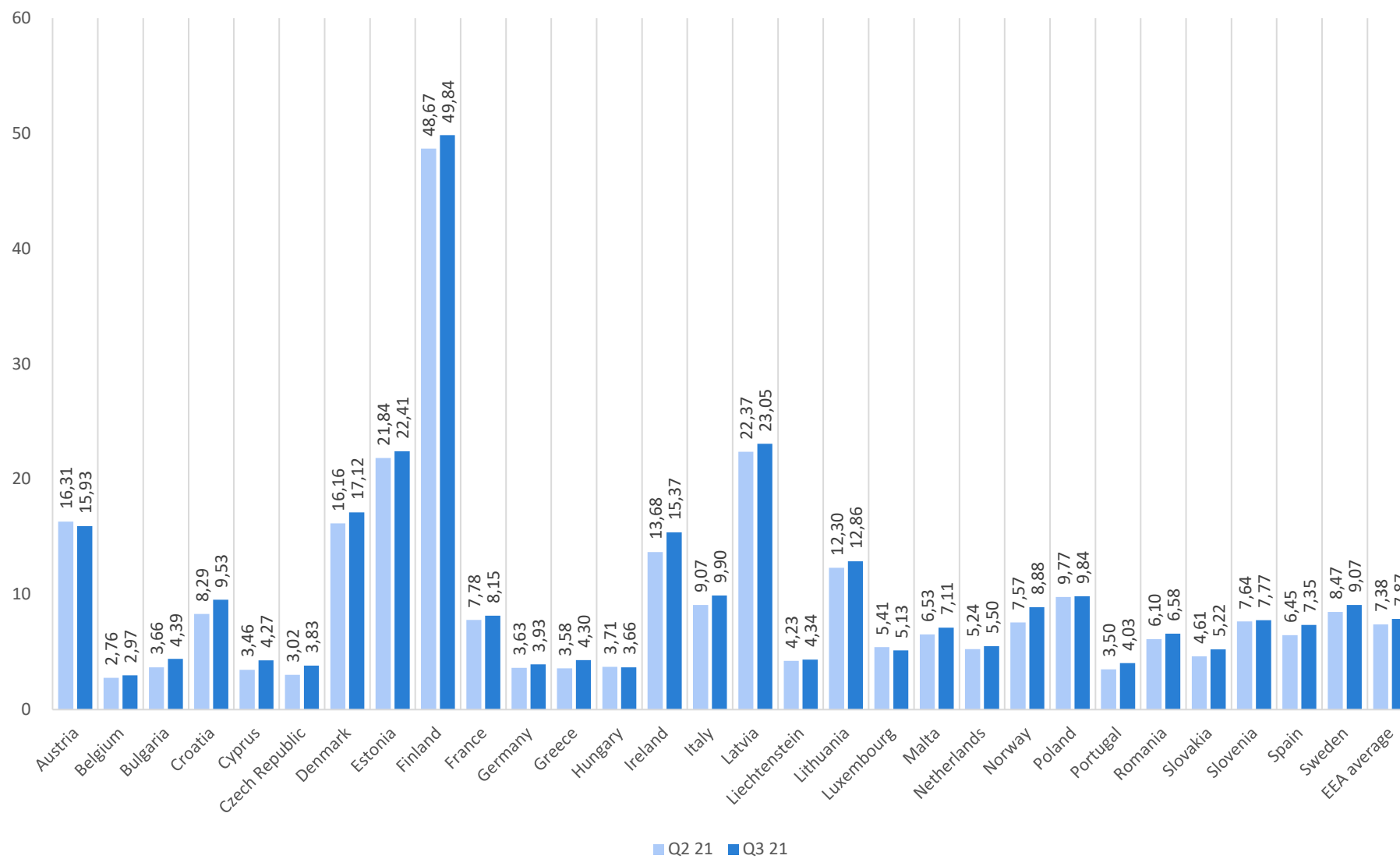
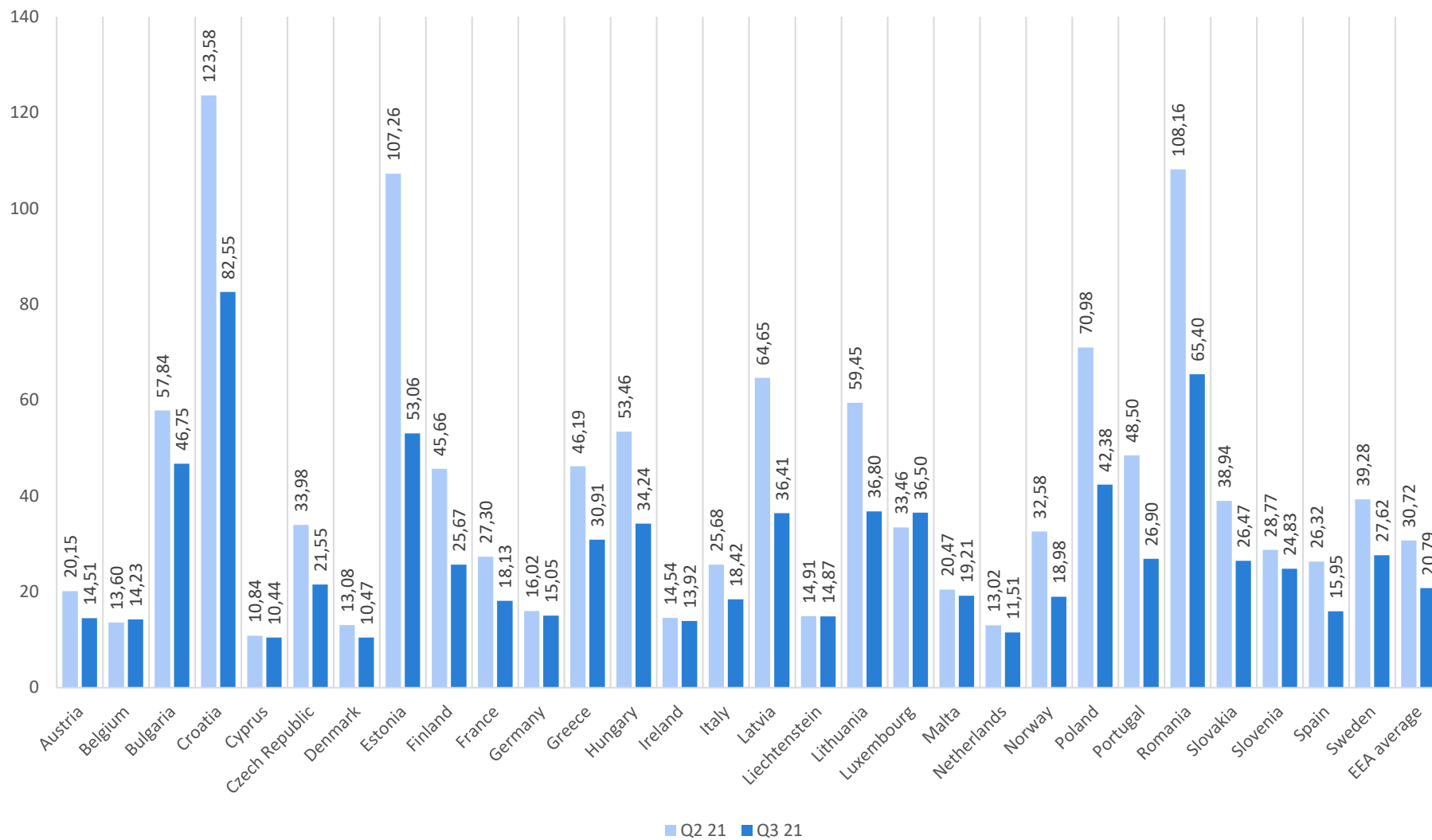


Figure 4: Domestic data services: average consumption per month per total number of subscribers (GB), Q2 21 and Q3 21



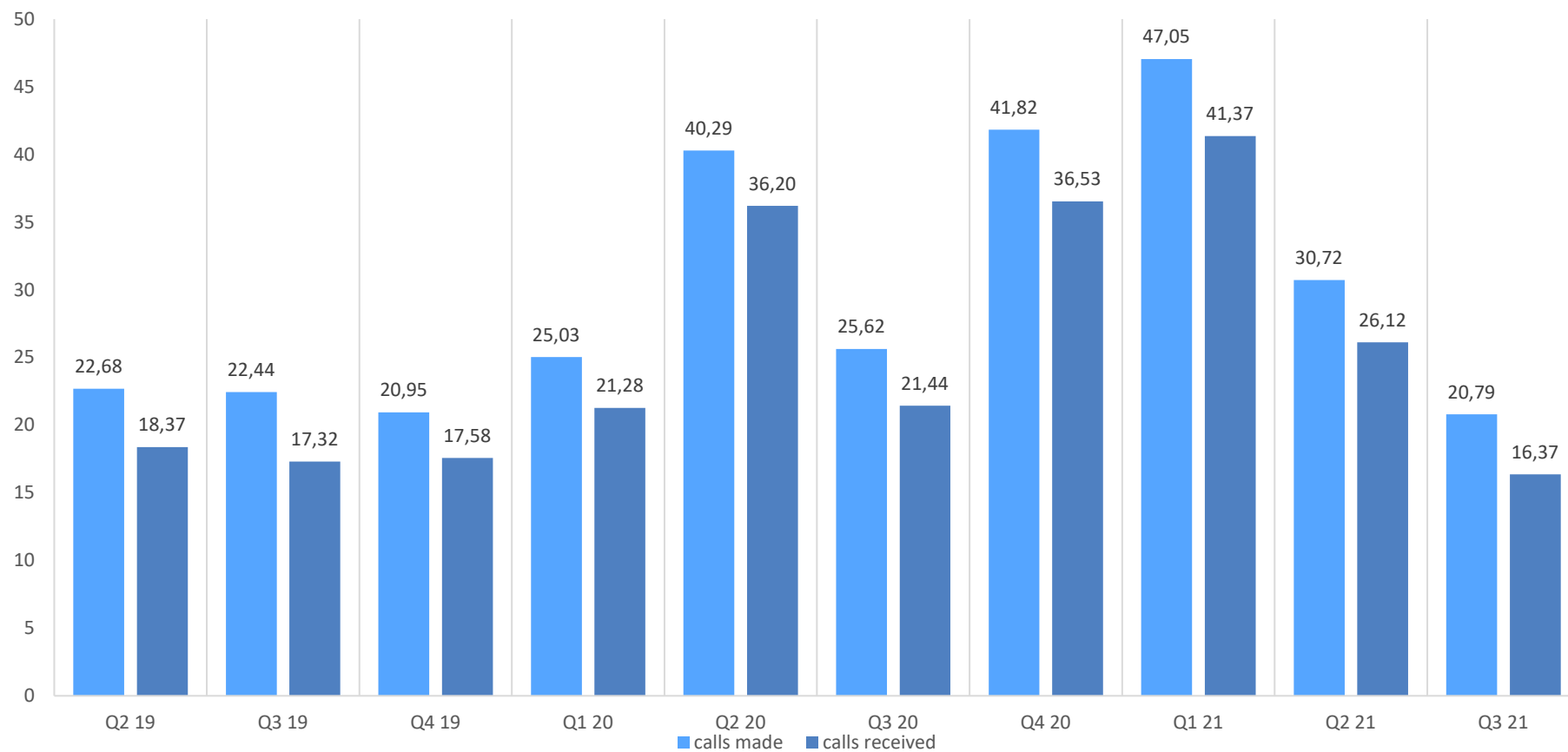
4.1.3. Consumption patterns for RLAH services (voice, SMS and data)

Figure 5: RLAH, calls made: average number of RLAH minutes per month per total number of roaming subscribers with active RLAH services, Q2 21 and Q3 21



In some cases, not all operators provided the data for RLAH subscribers

Figure 6: EEA average number of RLAH minutes per month per total number of roaming subscribers with active RLAH services, Q2 19 – Q3 21

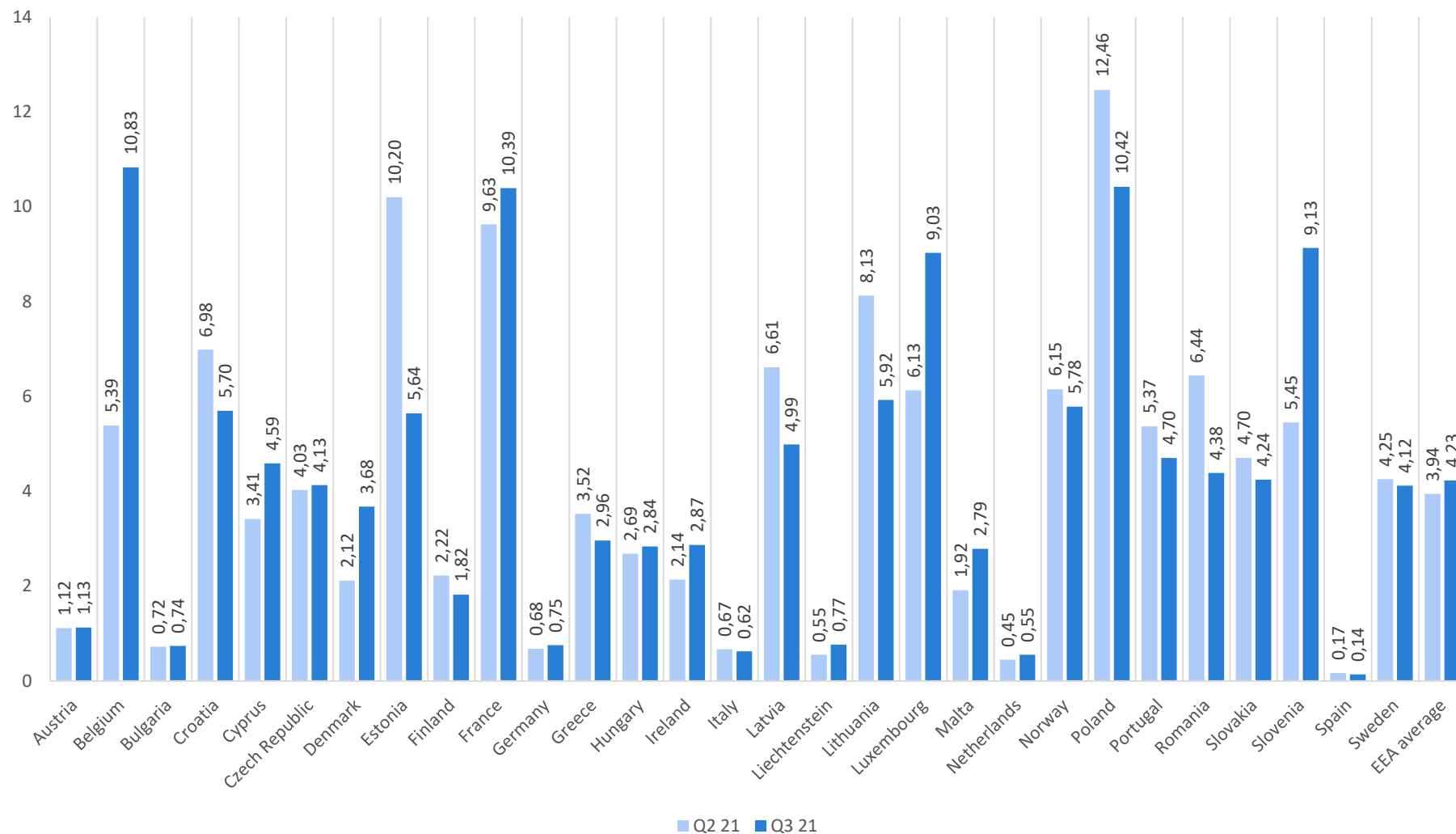


BEREC changed the way it presents consumption patterns for RLAH services in order to make it easier to interpret. Since Q2 18, the indicator has been calculated by dividing RLAH volumes by number of active subscribers with RLAH services that were roaming at least once in the concerned period in the EEA. This is to ensure that period-to-period changes in the indicator are not influenced by subscribers with different tariff plans.

In some cases, not all operators provided the data for RLAH subscribers.

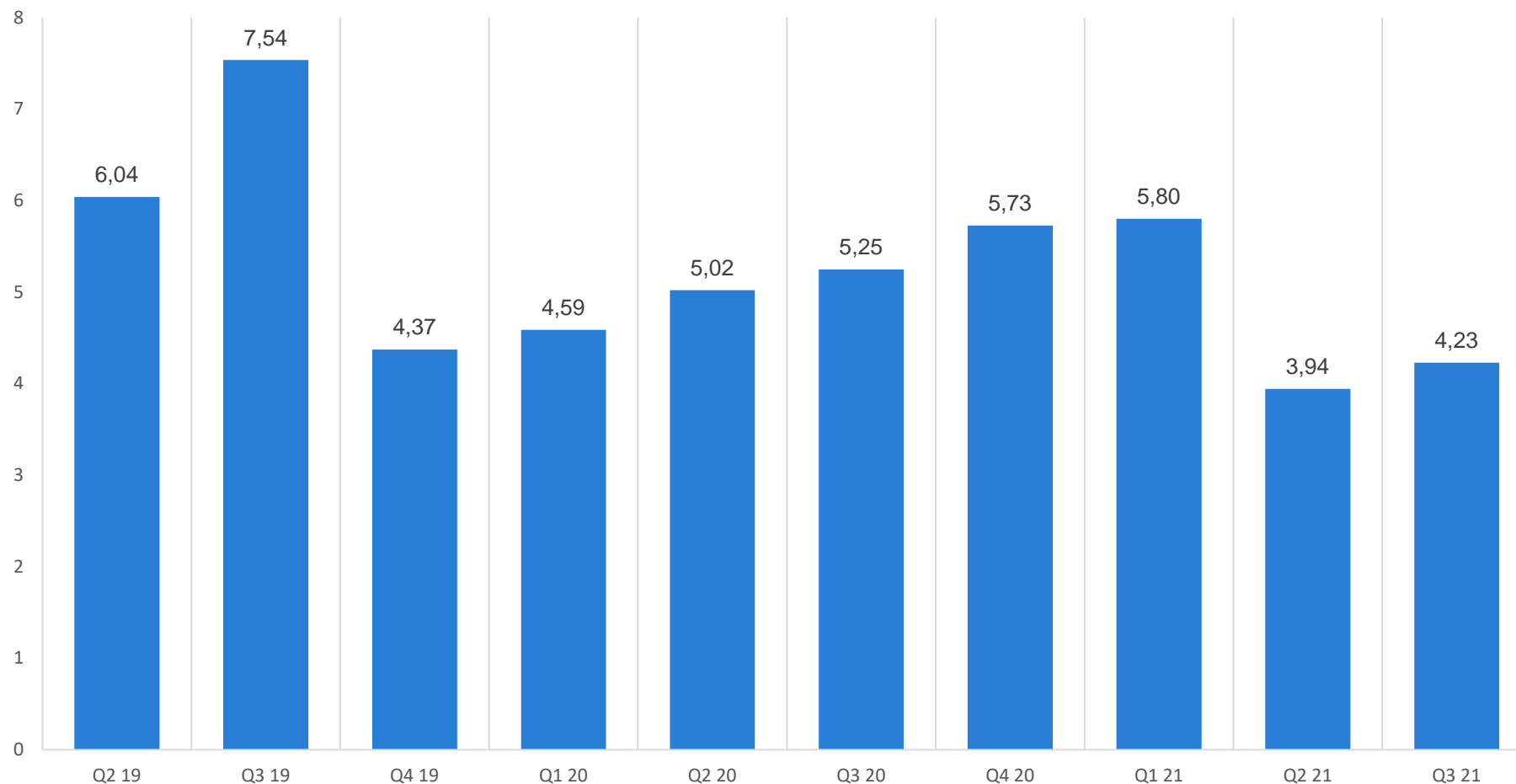
The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 7: RLAH, SMS services: average number of SMS per month per total number of roaming subscribers with active RLAH services, Q2 21 and Q3 21



In some cases, not all operators provided the data for RLAH subscribers

Figure 8: EEA average number of SMS per month per total number of roaming subscribers with active RLAH services, Q2 19 – Q3 21

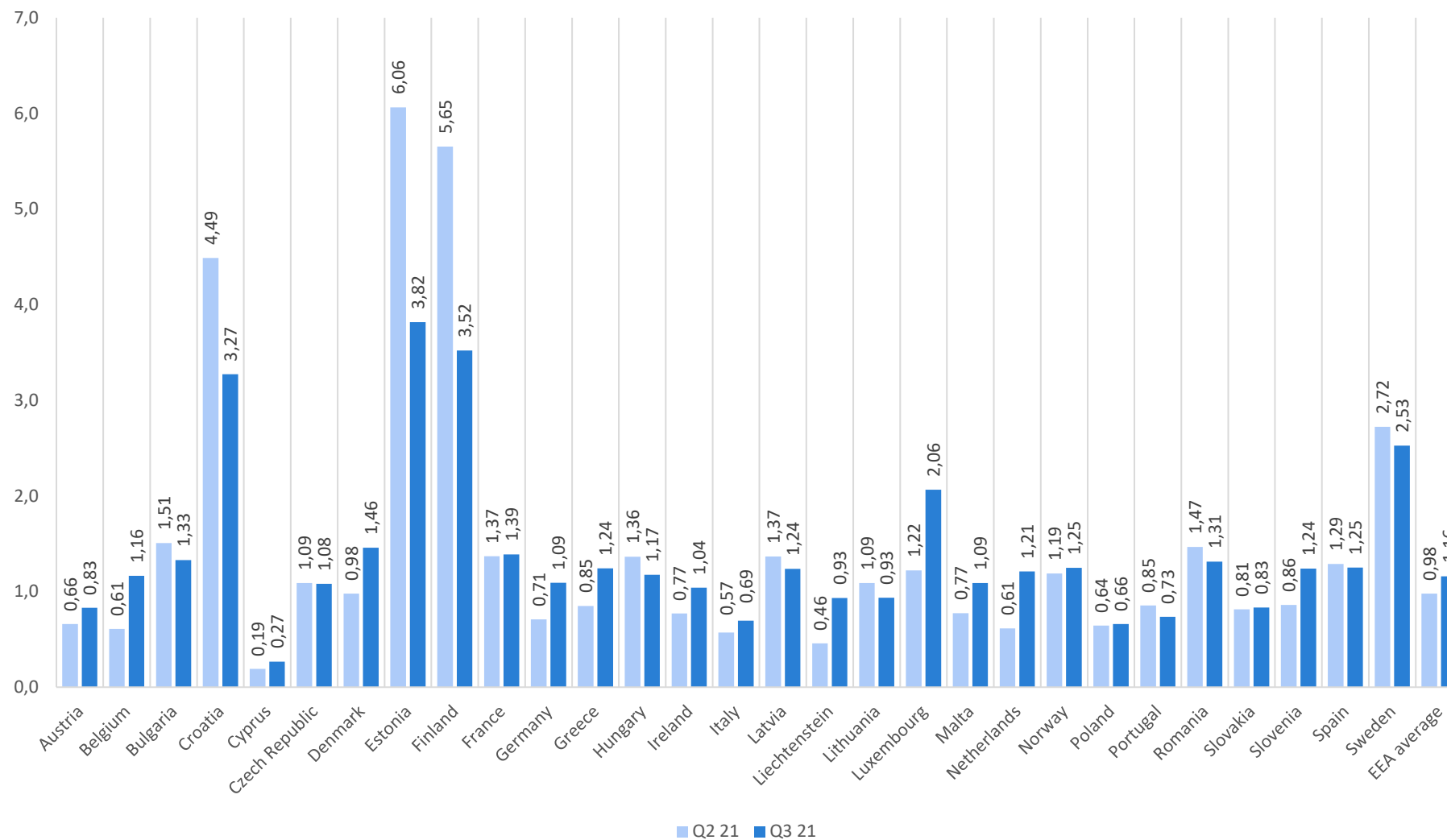


BEREC changed the way it presents consumption patterns for RLAH services in order to make it easier to interpret. Since Q2 18, the indicator has been calculated by dividing RLAH volumes by number of active subscribers with RLAH services that were roaming at least once in the concerned period in the EEA. This is to ensure that period-to-period changes in the indicator are not influenced by subscribers with different tariff plans.

In some cases, not all operators provided the data for RLAH subscribers.

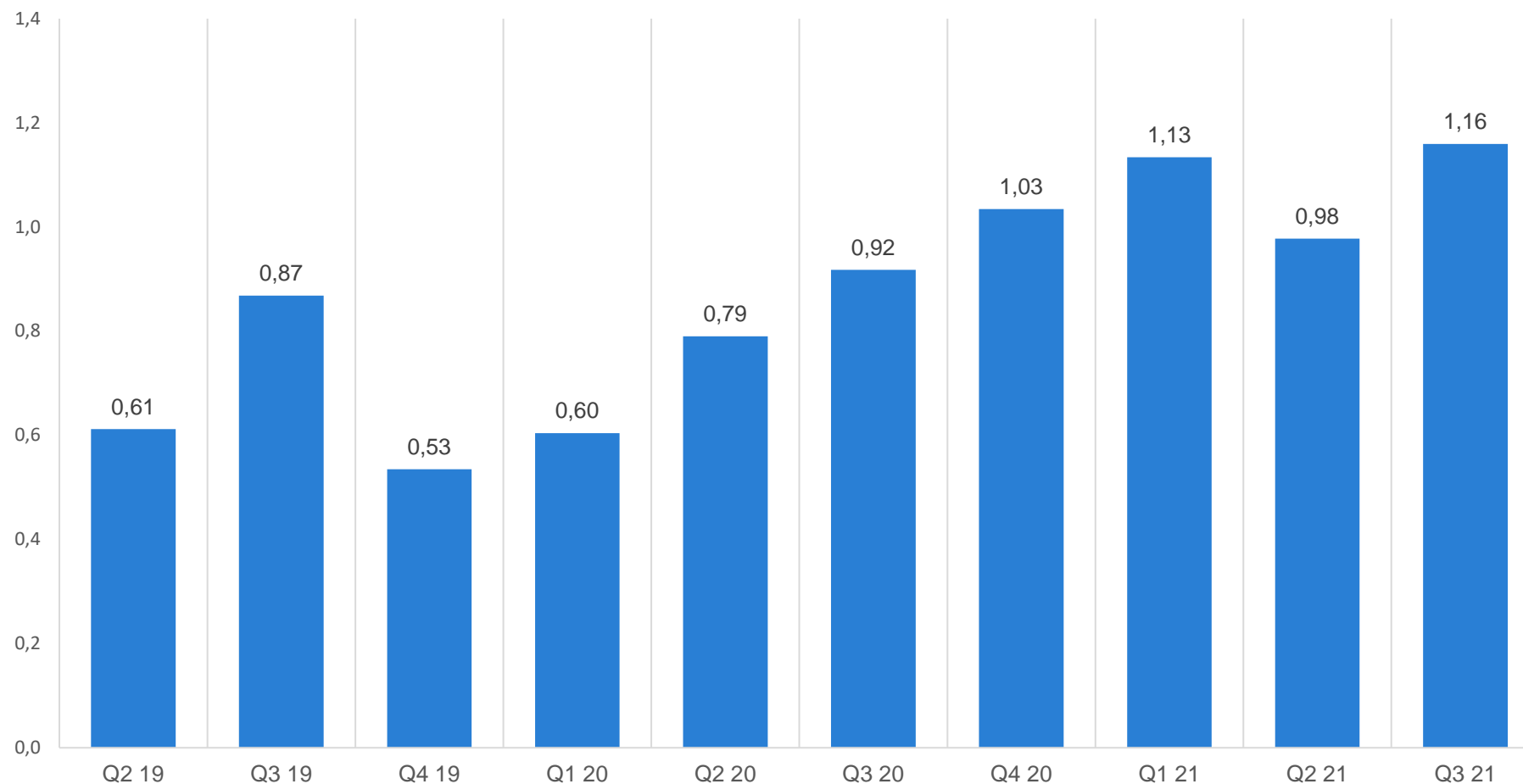
The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 9: RLAH, data services: average consumption per month per total number of roaming subscribers with active RLAH services (in GB), Q2 21 and Q3 21



In some cases, not all operators provided the data for RLAH subscribers.

Figure 10: RLAH, data services: EEA average consumption per month per total number of roaming subscribers with active RLAH services (in GB), Q2 19 – Q3 21



BEREC changed the way it presents consumption patterns for RLAH services in order to make it easier to interpret. Since Q2 18, the indicator has been calculated by dividing RLAH volumes by number of active subscribers with RLAH services that were roaming at least once in the concerned period in the EEA. This is to ensure that period-to-period changes in the indicator are not influenced by subscribers with different tariff plans.

In some cases, not all operators provided the data for RLAH subscribers.

The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 11: Share of total subscribers with EU/EEA roaming enabled, Q3 21

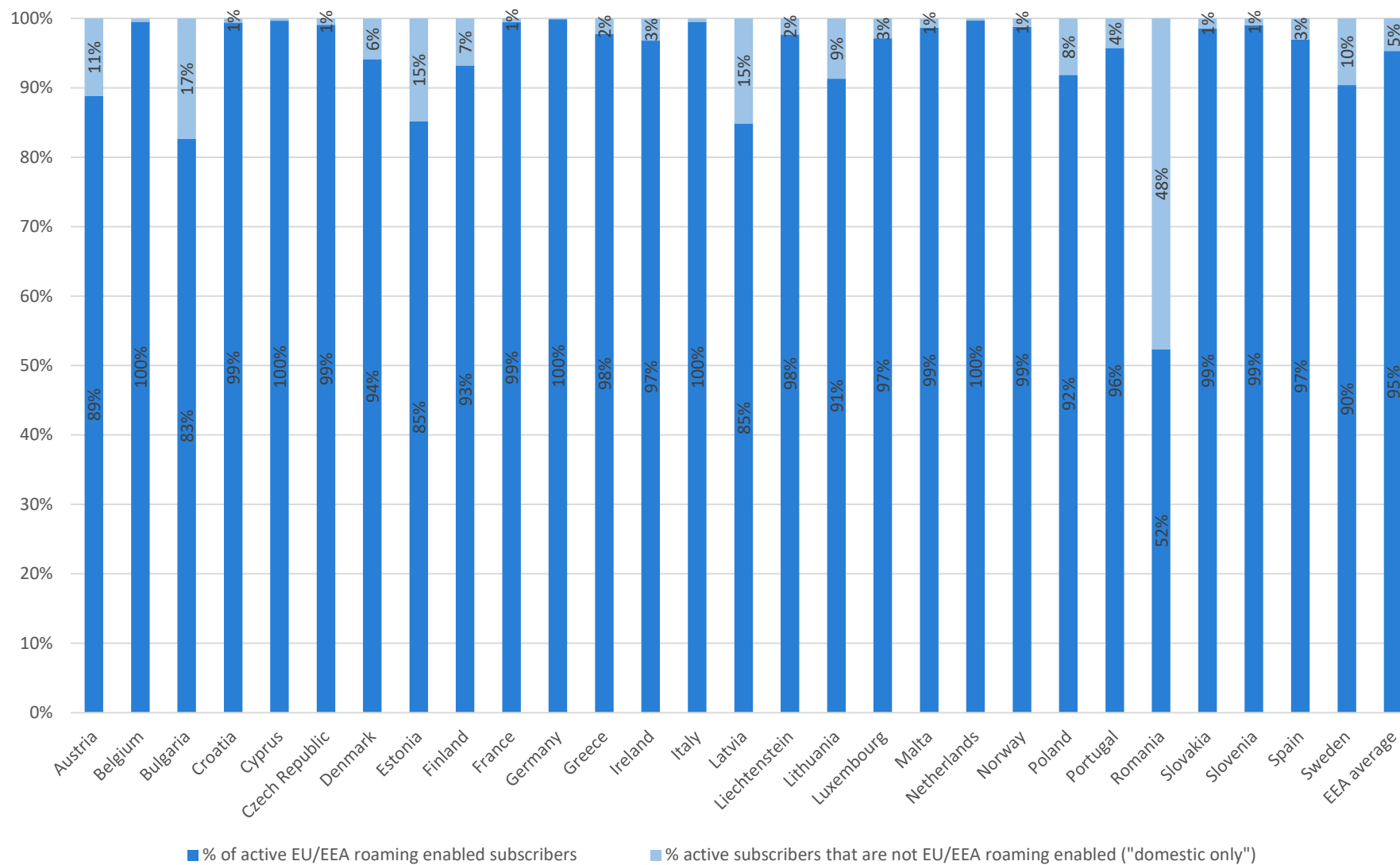
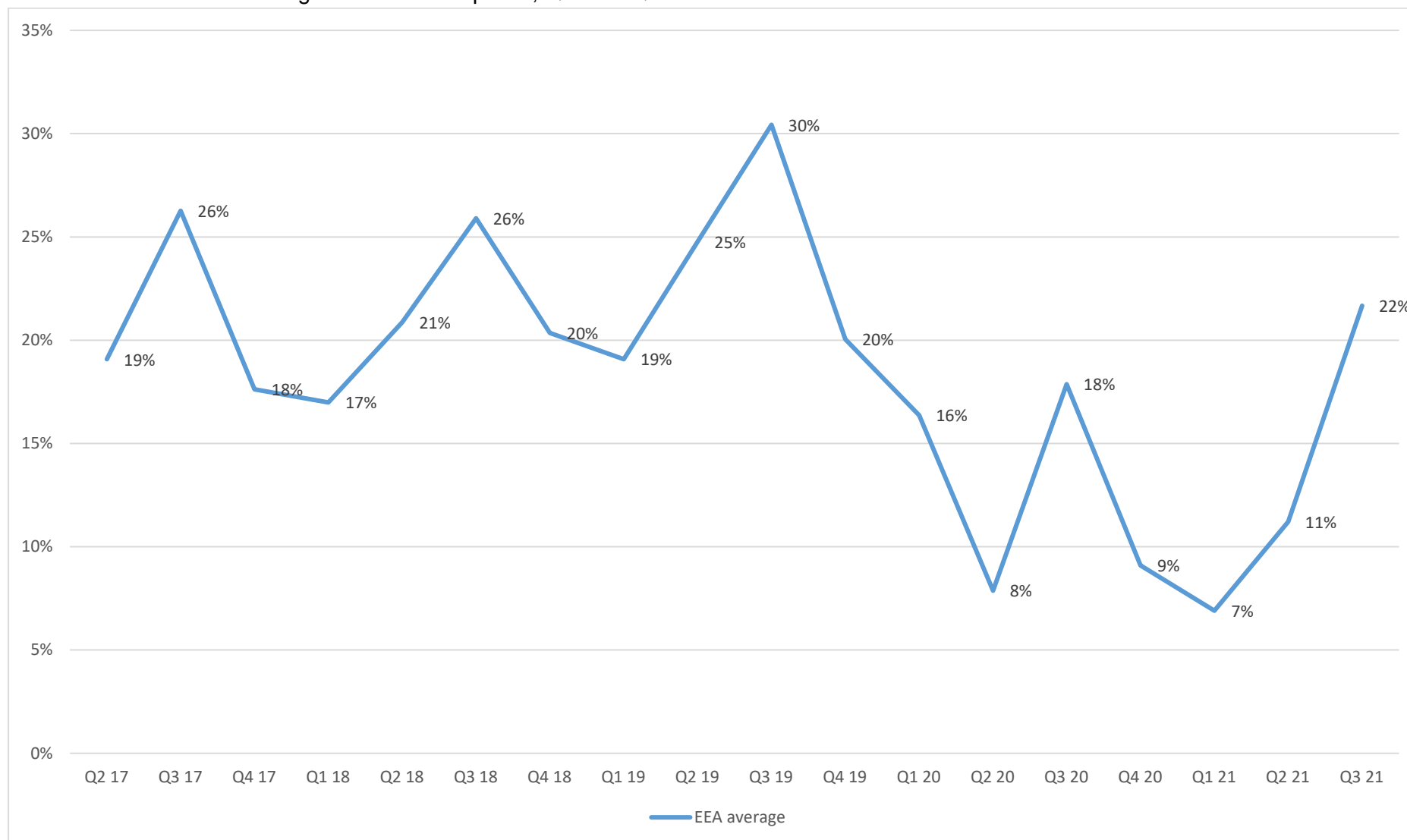


Figure 12: Percentages of subscribers that were roaming at least once in the concerned quarter in the EEA, compared to the total number of subscribers who have roaming enabled subscriptions, Q2 17 – Q3 21

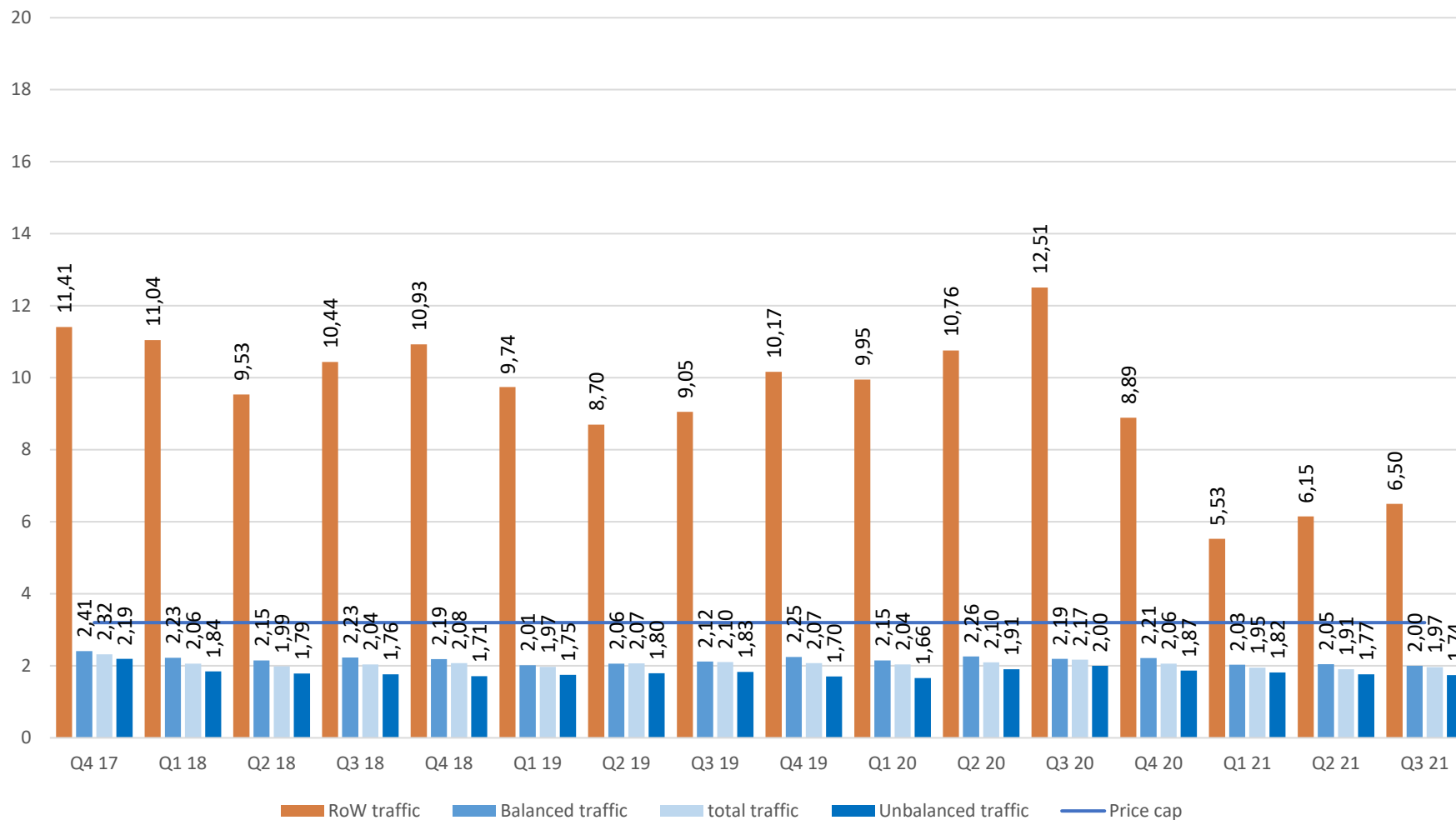


4.2. The development of Roaming Services

4.2.1. Voice roaming services

4.2.1.1 Wholesale prices

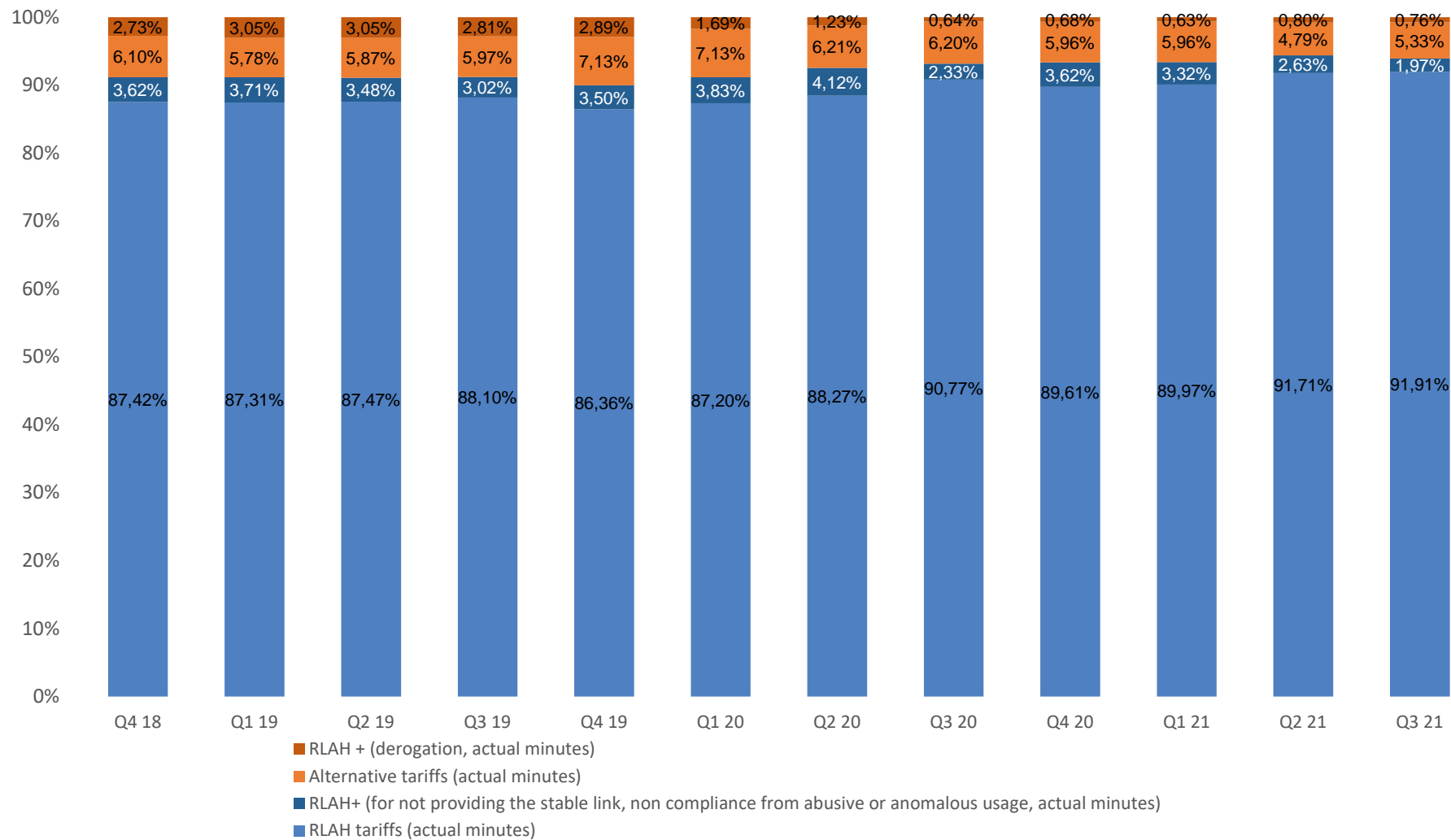
Figure 13: EEA and RoW average wholesale price per minute, Q4 17 – Q3 21 (balanced, unbalanced, total and RoW traffic)



The EEA average includes United Kingdom operators' data until Q3 2019.

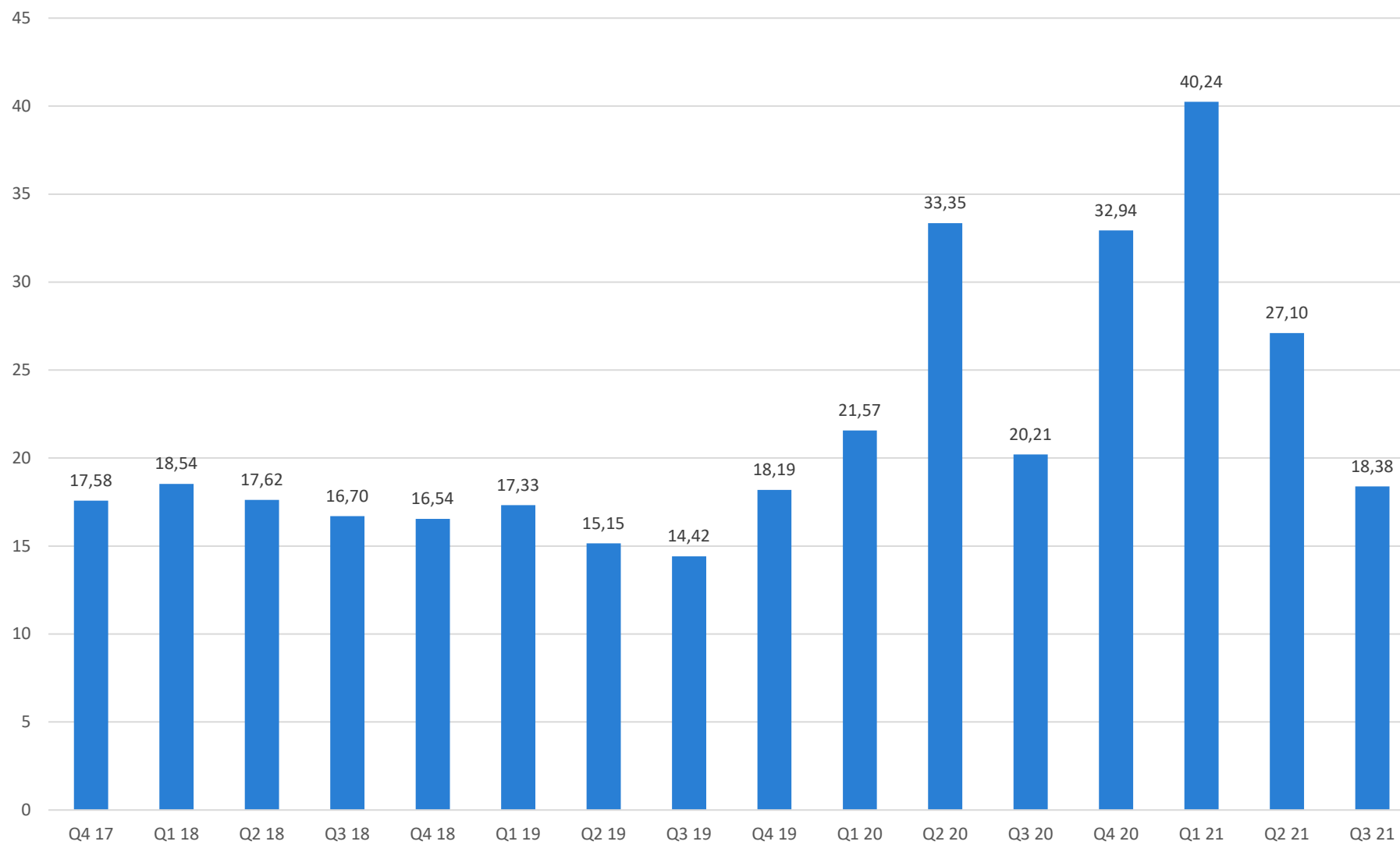
4.2.1.2 Consumption patterns

Figure 14: EEA percentage and volumes of total minutes of calls made, Q4 18 – Q3 21



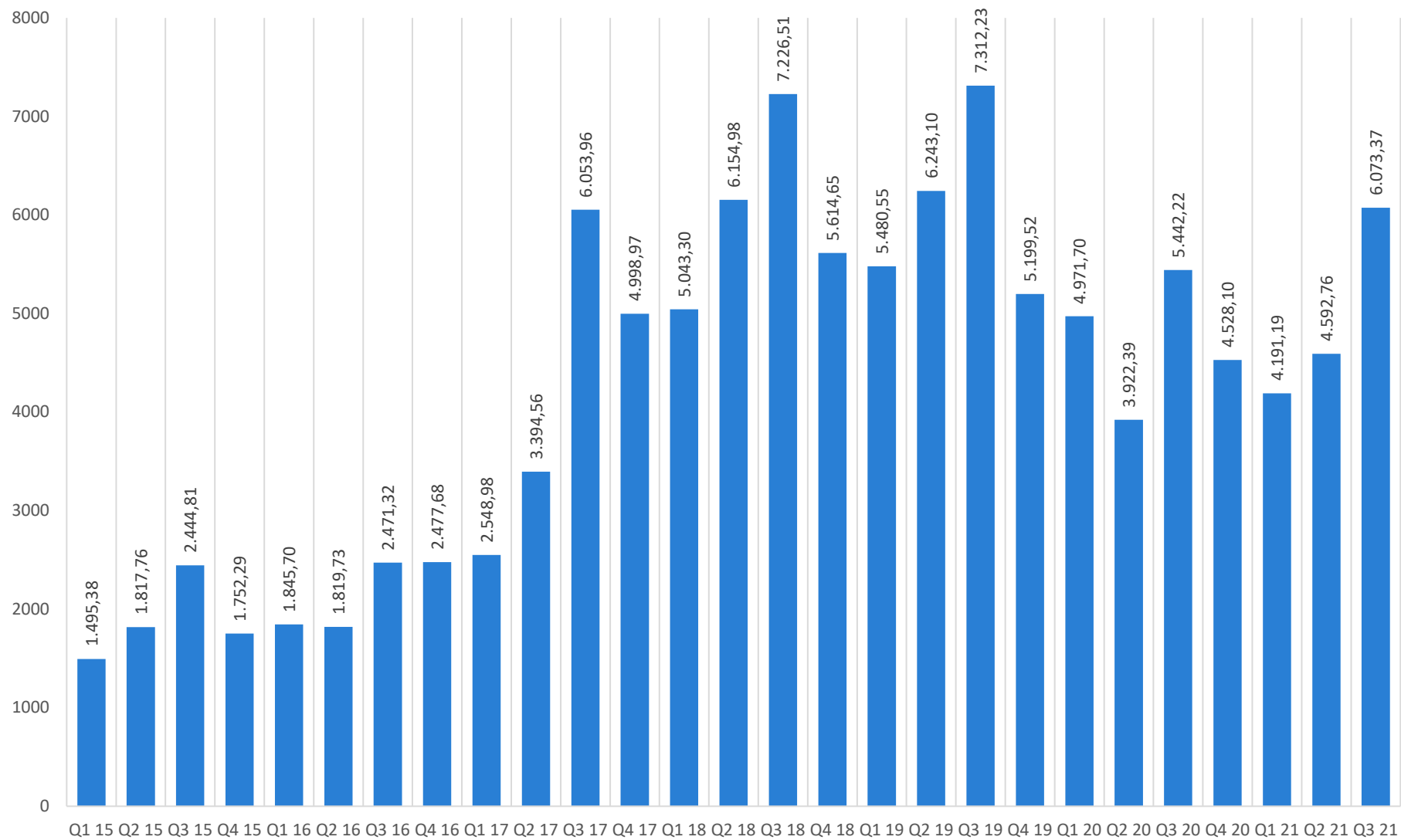
The EEA average includes United Kingdom operators' data until Q3 2019.
 EEA average (Q2 and Q3 2021) excludes: Poland.

Figure 15: Roaming calls made: EEA average number of minutes per month per total number of roaming subscribers Q4 17 – Q3 21



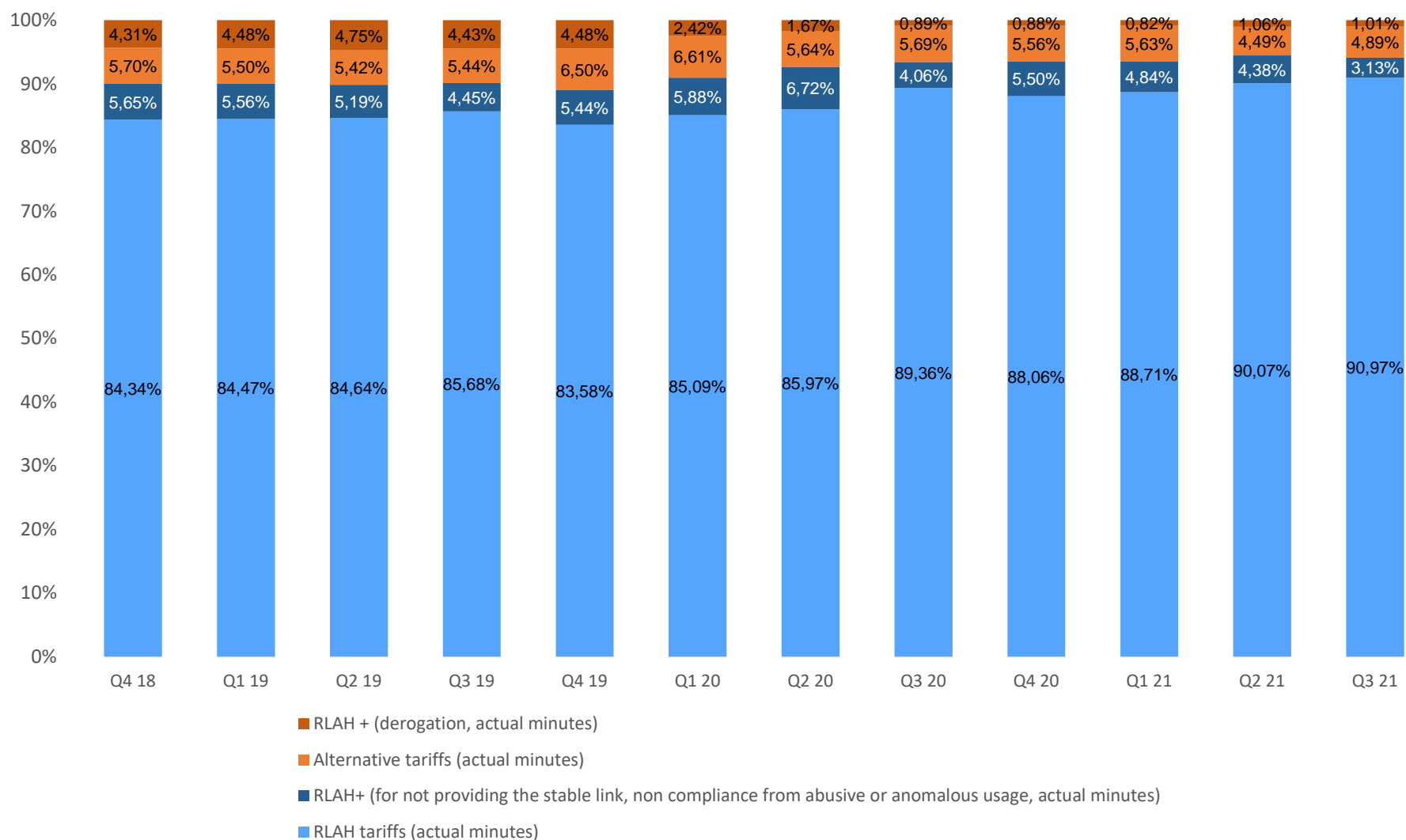
The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 16: EEA average: Roaming calls made traffic, (millions of minutes), Q1 15 – Q3 21



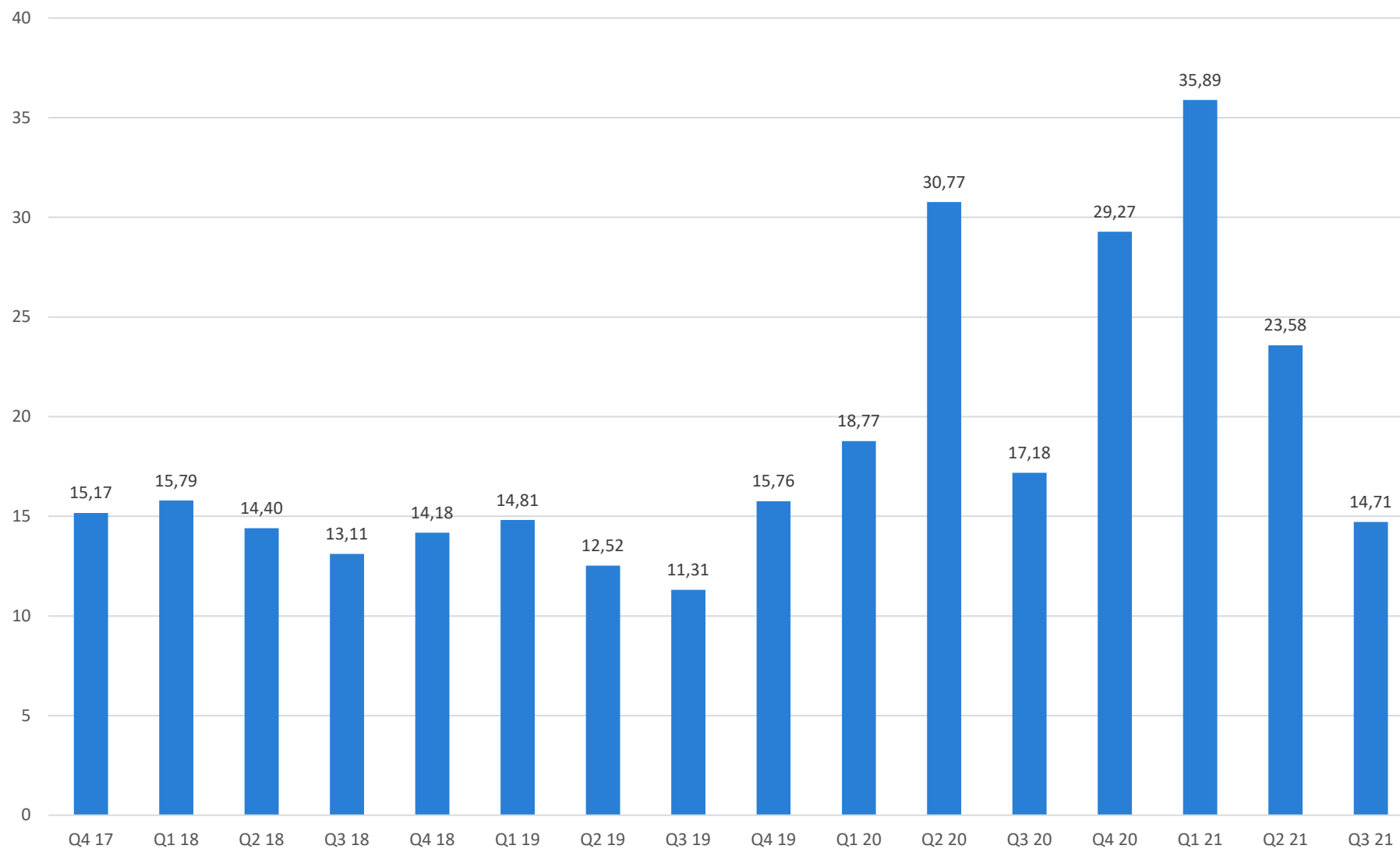
The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 17: EEA volumes and percentage of total minutes of calls received, Q4 18 – Q3 21



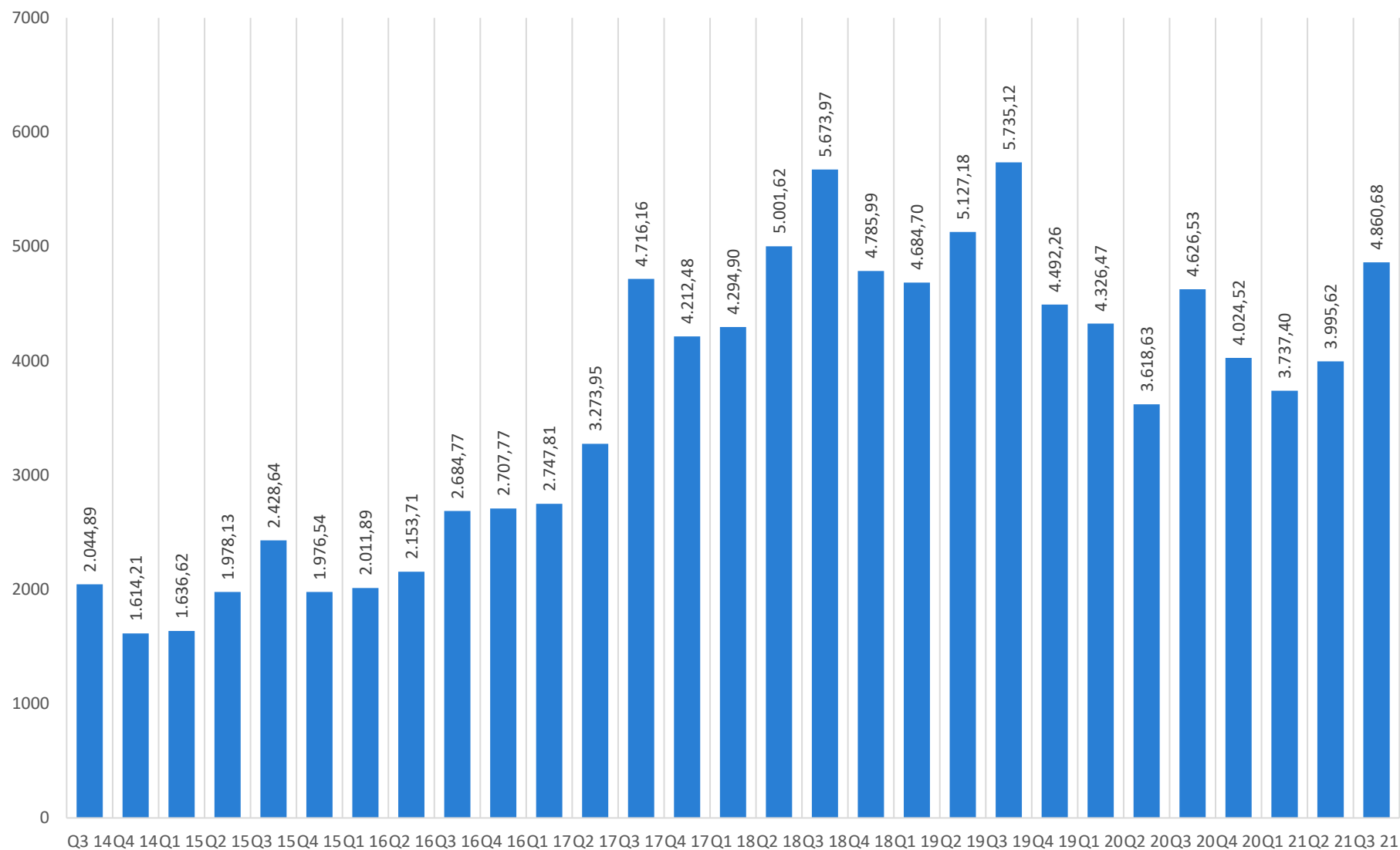
The EEA average includes United Kingdom operators' data until Q3 2019.
 EEA average (Q2 and Q3 2021) excludes: Poland.

Figure 18: Roaming calls received: EEA average number of minutes per month per total number of roaming subscribers, Q4 17 – Q3 21



The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 19: EEA roaming calls received traffic, Q3 14 – Q3 21 (millions of minutes)

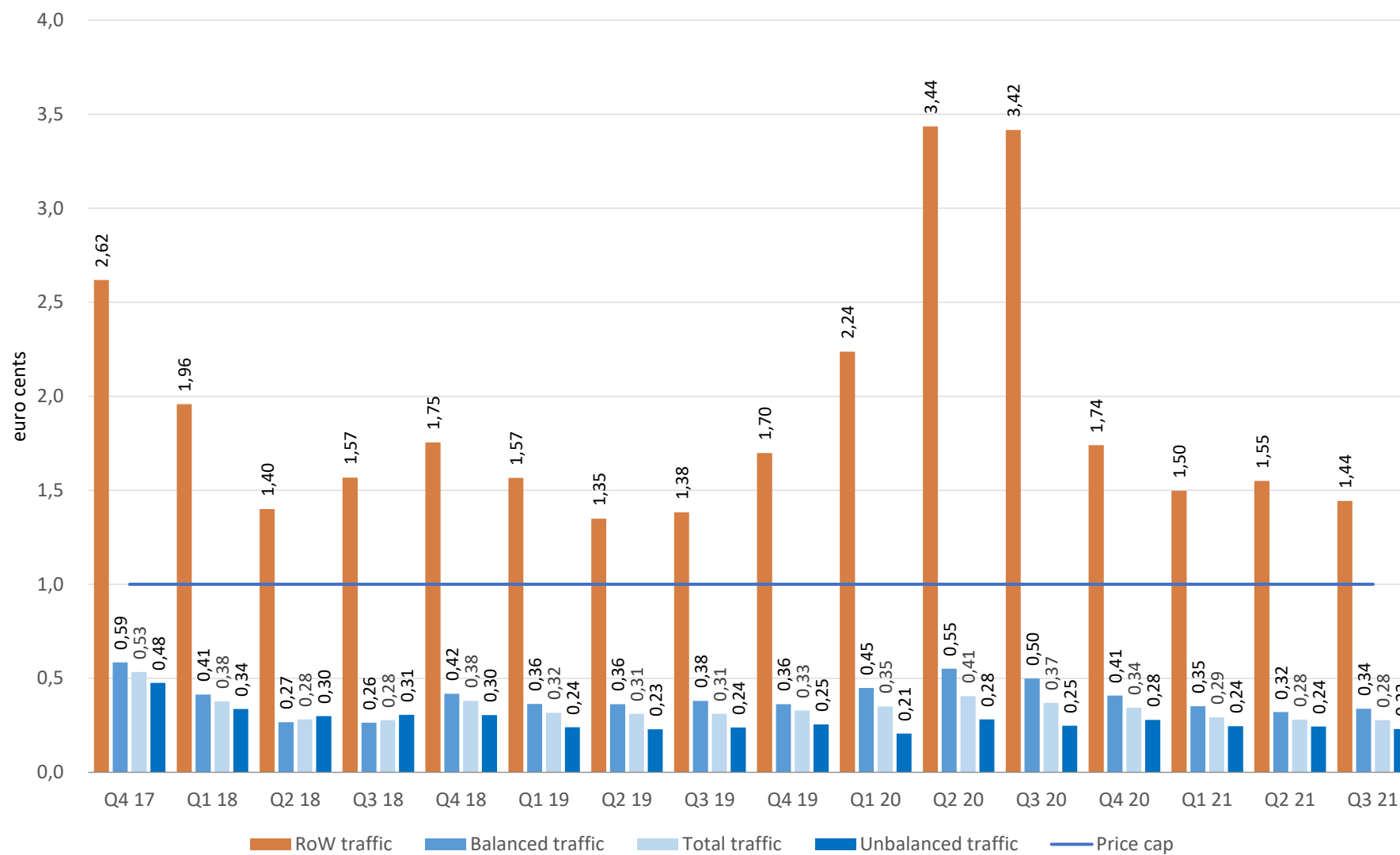


The EEA average includes United Kingdom operators' data until Q3 2019.

4.2.2. SMS roaming services

4.2.2.1 Wholesale prices

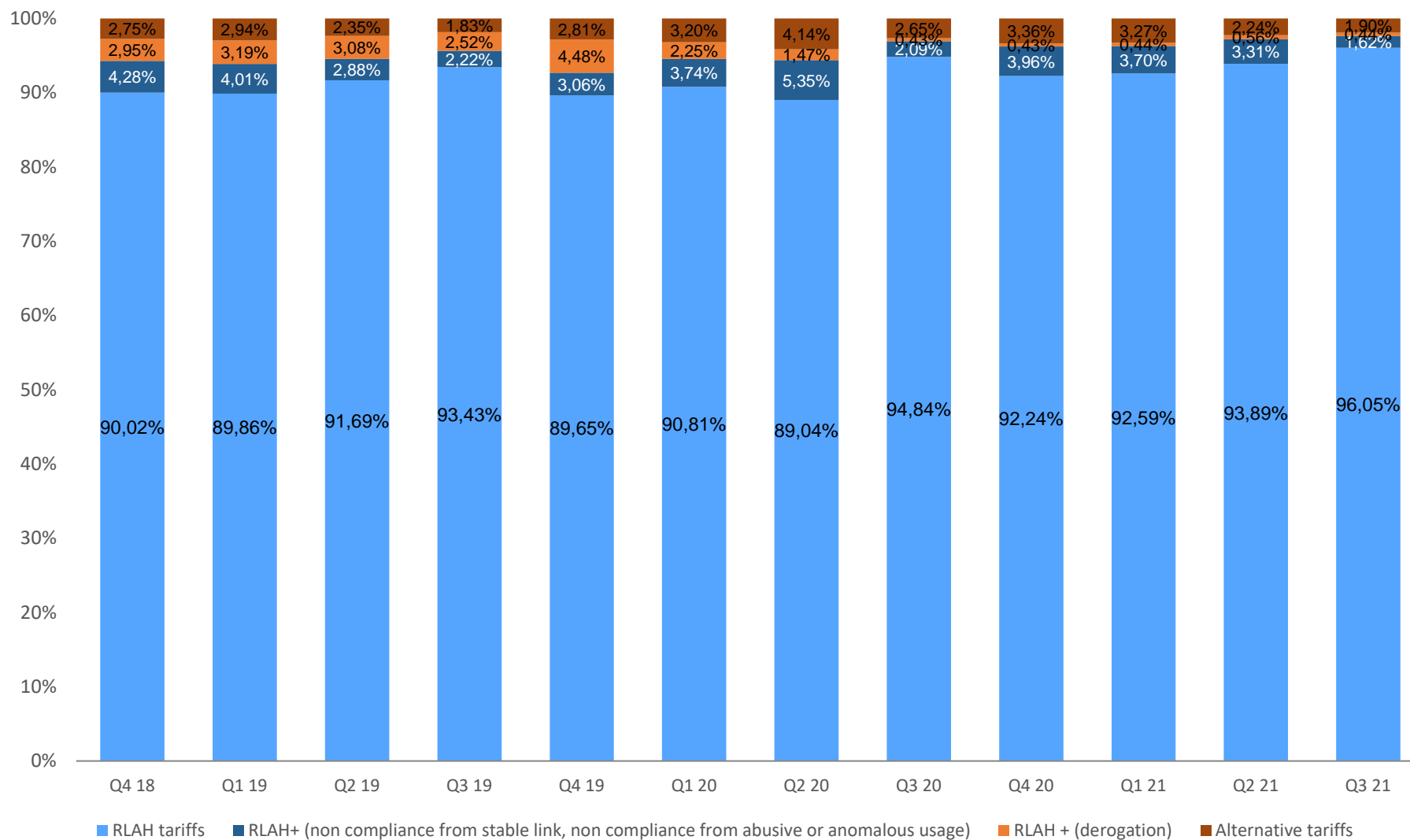
Figure 20: EEA average wholesale price per roaming SMS, Q4 17 – Q3 21 (balanced, unbalanced, total and RoW traffic)



The EEA average includes United Kingdom operators' data until Q3 2019.

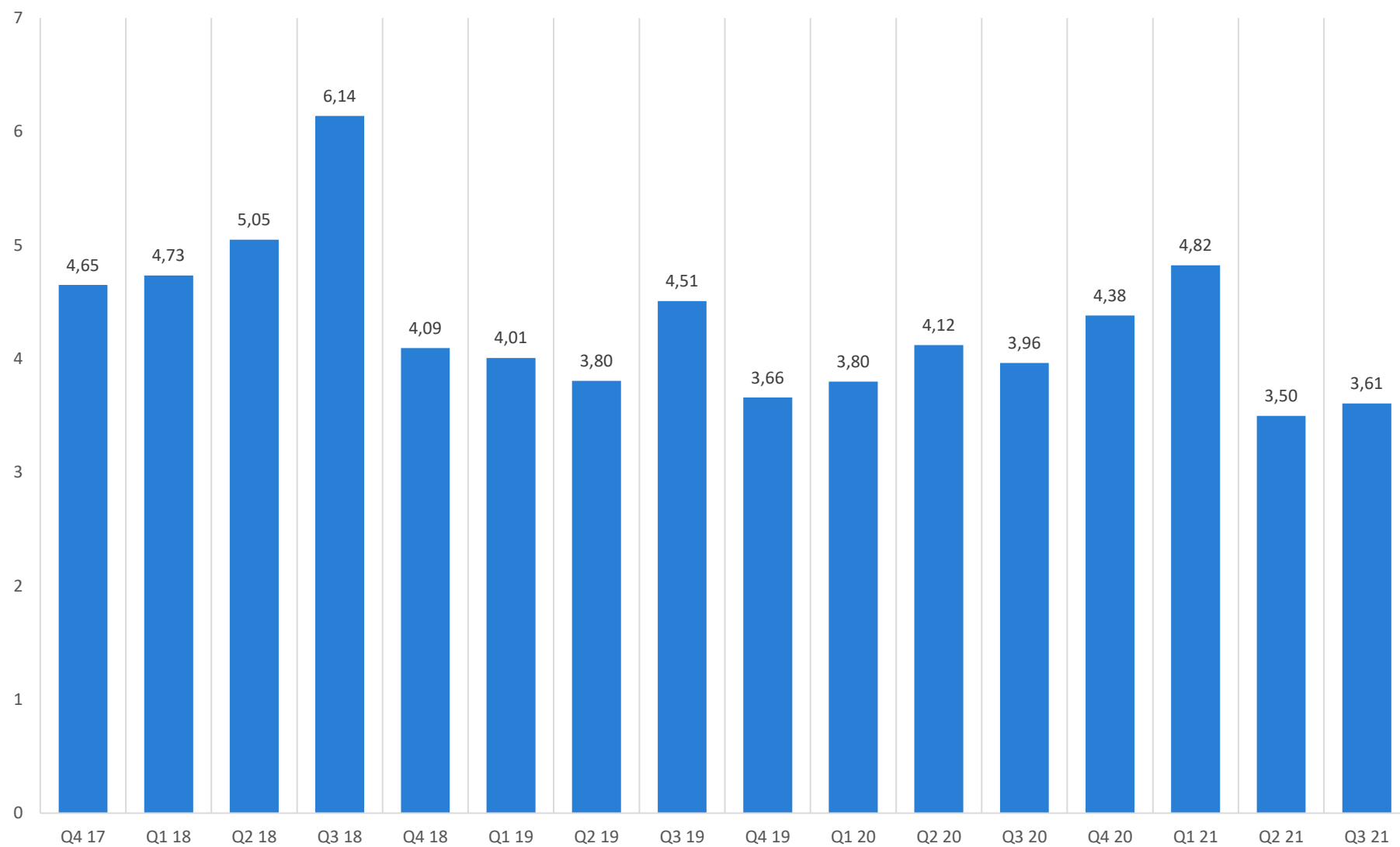
4.2.2.2 Consumption patterns

Figure 21: EEA percentage of SMS sent, Q4 18 – Q3 21



The EEA average includes United Kingdom operators' data until Q3 2019.
 EEA average (Q2 and Q3 2021) excludes: Poland.

Figure 22: EEA average number of SMS per month per total number of roaming subscribers, Q4 17 – Q3 21

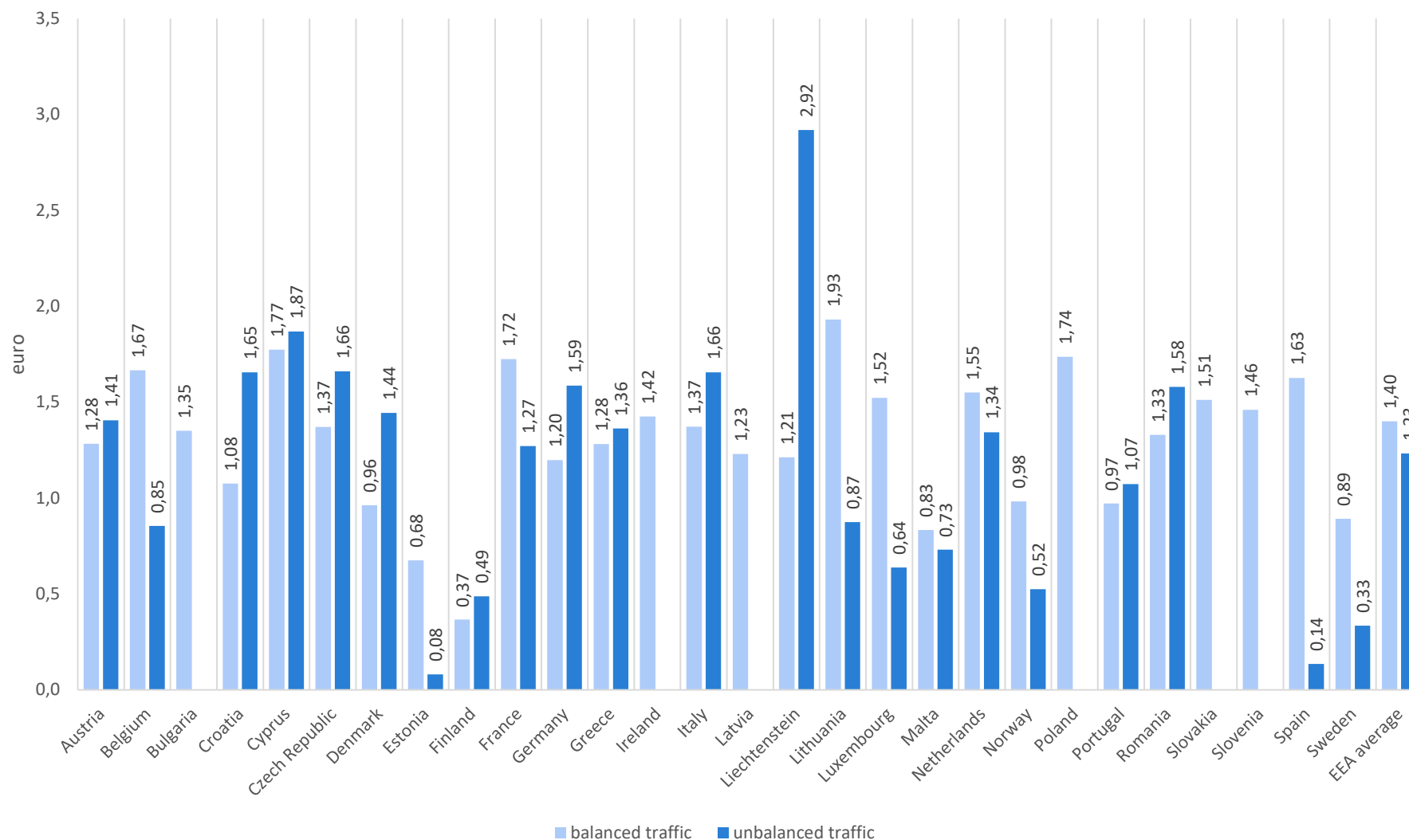


The EEA average includes United Kingdom operators' data until Q3 2019.

4.2.3.Data roaming services

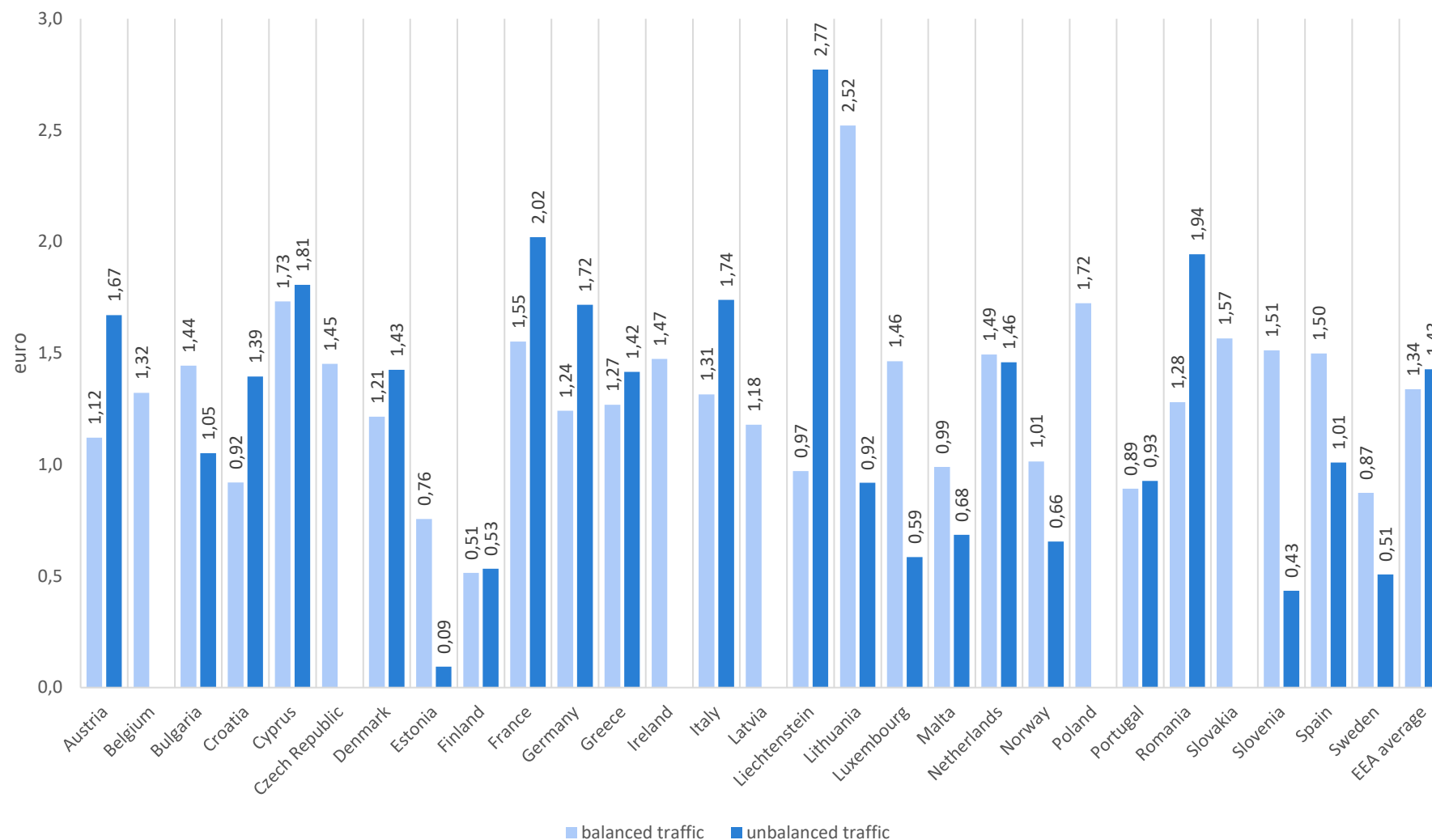
4.2.3.1 Wholesale prices

Figure 23: Average wholesale data price per GB (balanced and unbalanced traffic), Q2 21



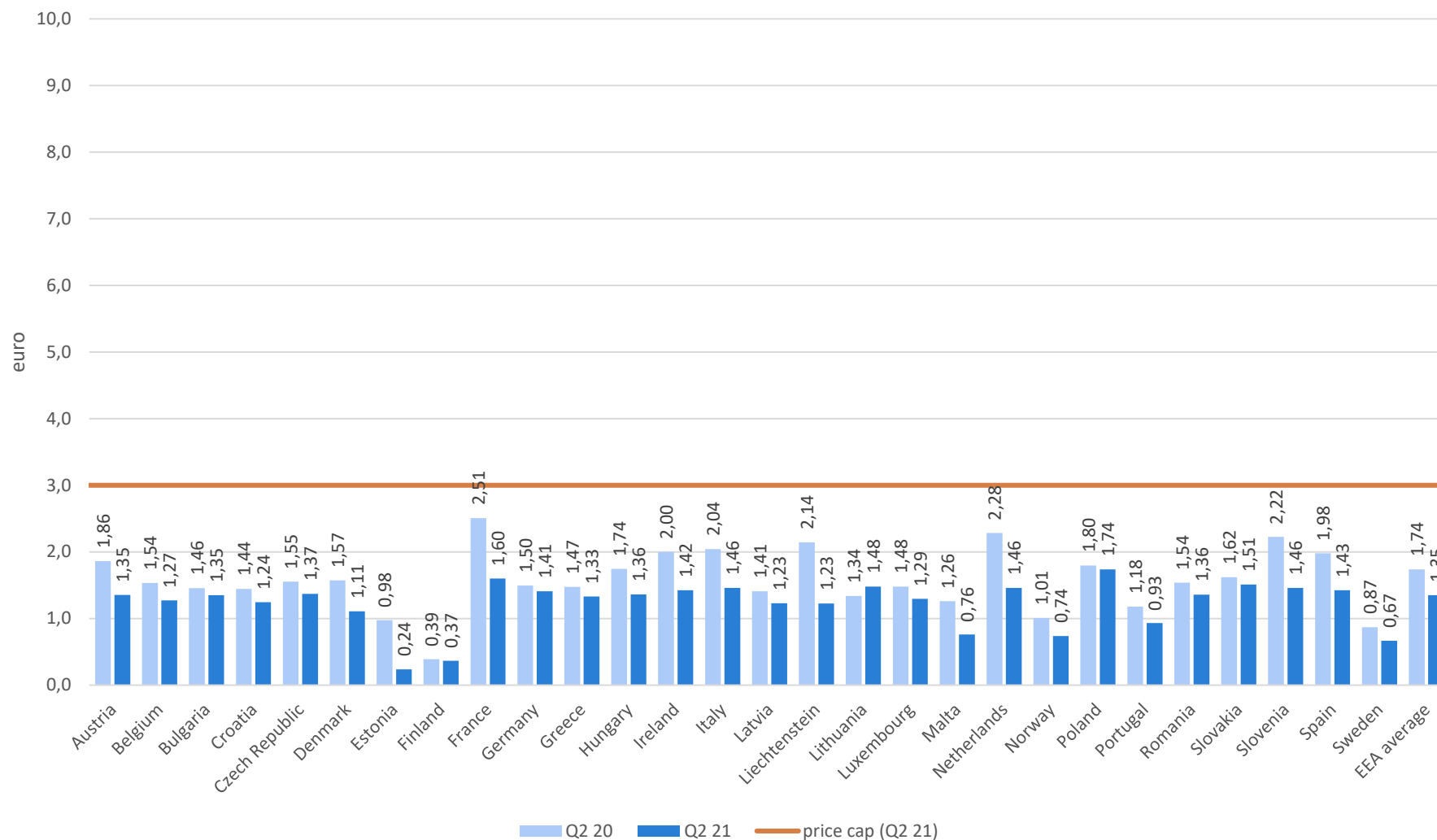
Portugal: the number of operators that reported data for calculating these estimates (disaggregated for balanced and unbalanced traffic) is different from the number of operators that reported data for calculating the estimates (non-disaggregated) in Figure 25 and Figure 26.

Figure 24: Average wholesale data price per GB (balanced and unbalanced traffic), Q3 21



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 Figure 25 and Figure 26.

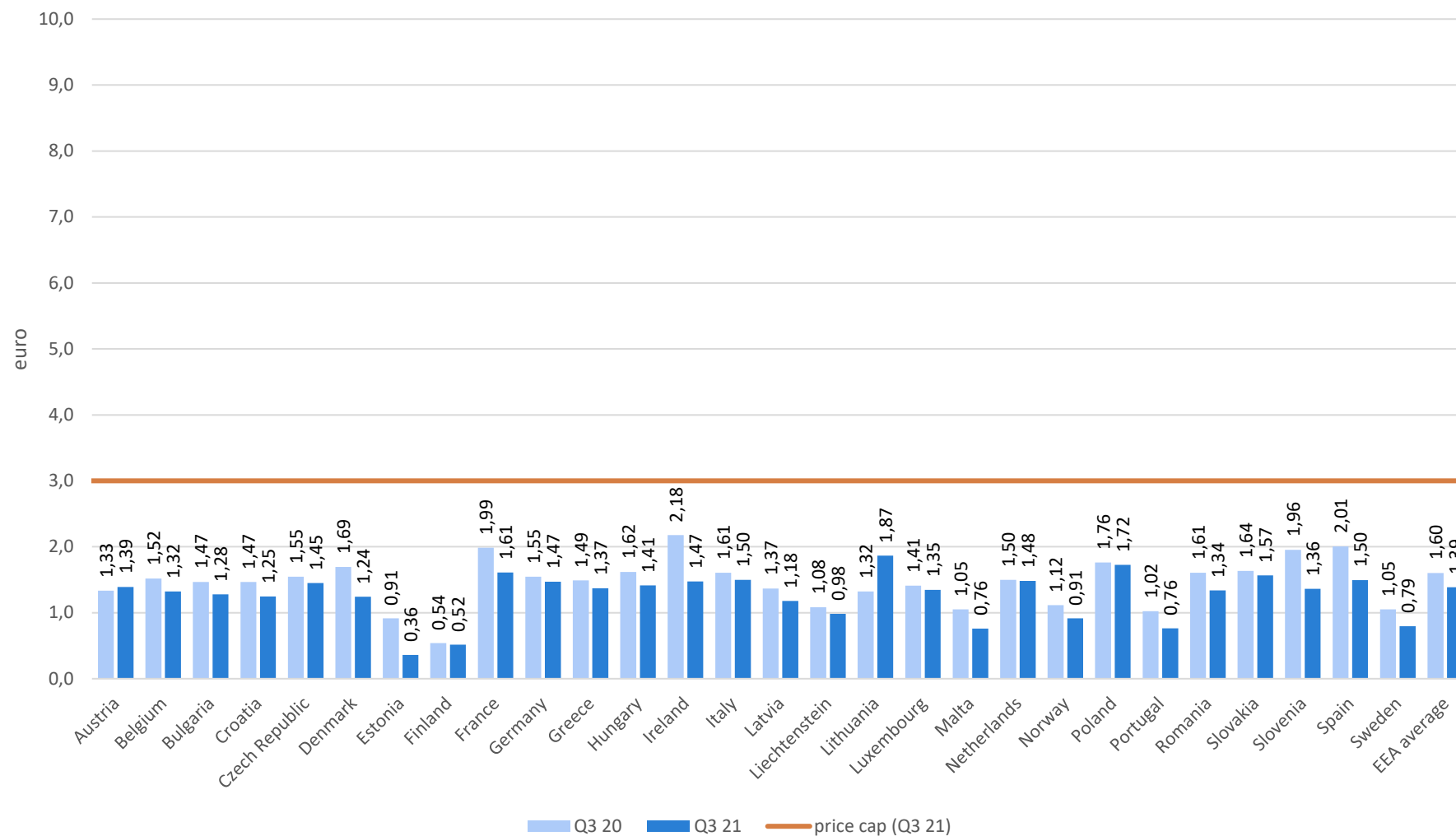
Figure 25: Total traffic: average wholesale data price per GB, Q2 20 and Q2 21



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 Figure 23 and Figure 24.

EEA average (Q2 2021) excludes: Cyprus.

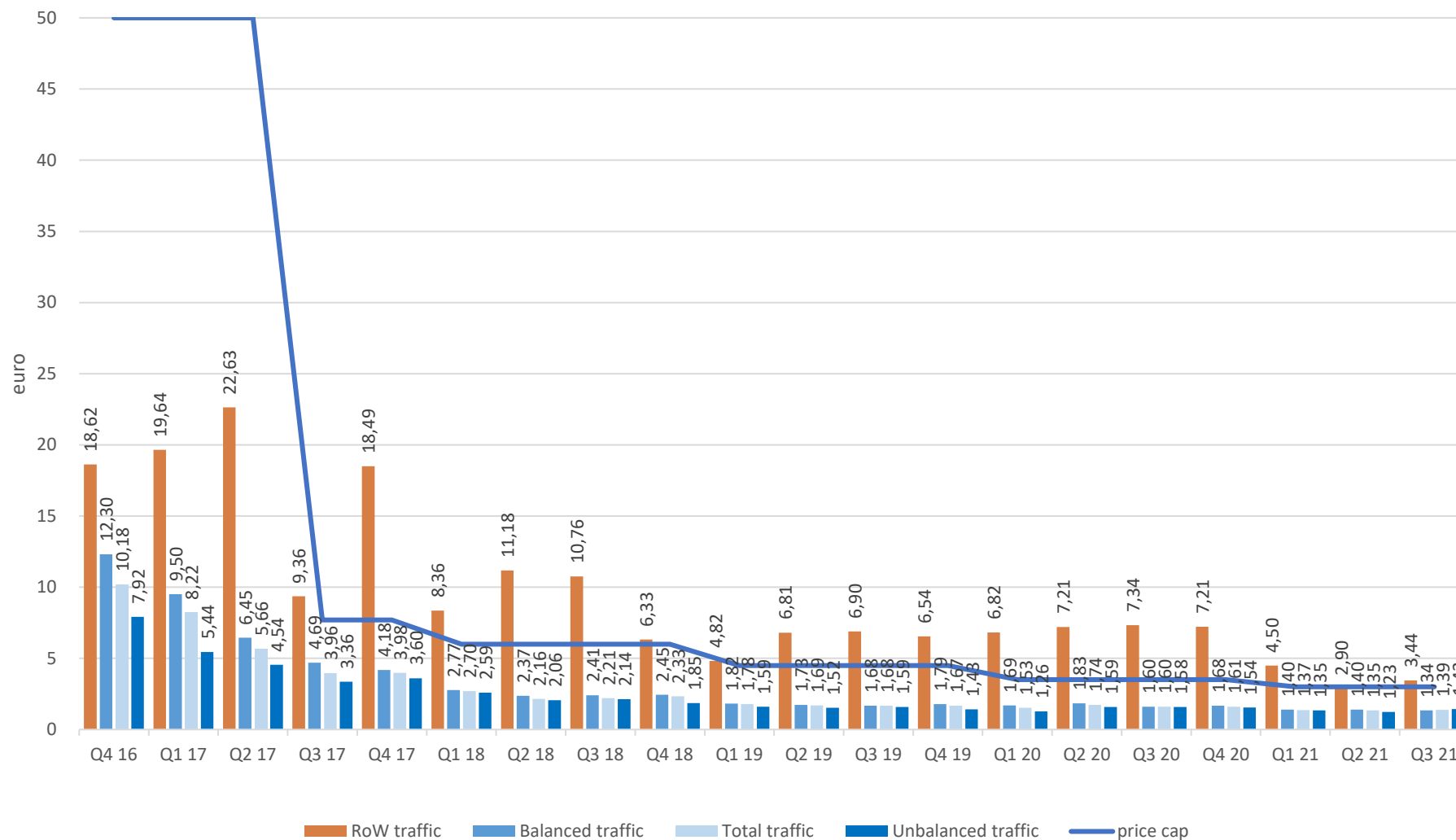
Figure 26: Total data traffic: average wholesale data price per GB, Q3 20 and Q3 21



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 Figure 23 and Figure 24.

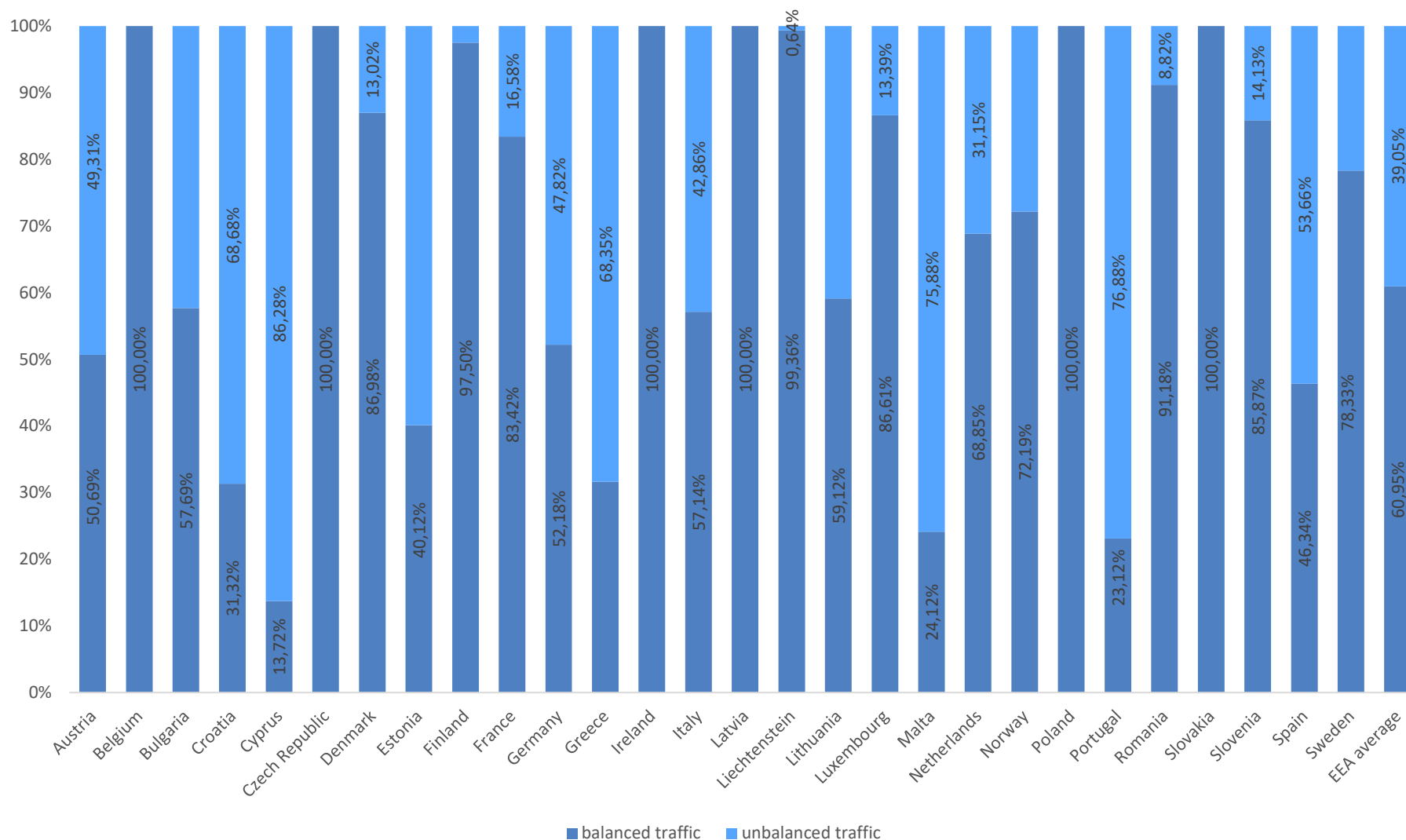
EEA average (Q3 2021) excludes: Cyprus.

Figure 27: EEA average wholesale data price per GB, Q4 16 – Q3 21 (balanced, unbalanced, total and RoW traffic)



The EEA average includes United Kingdom operators' data until Q3 2019.

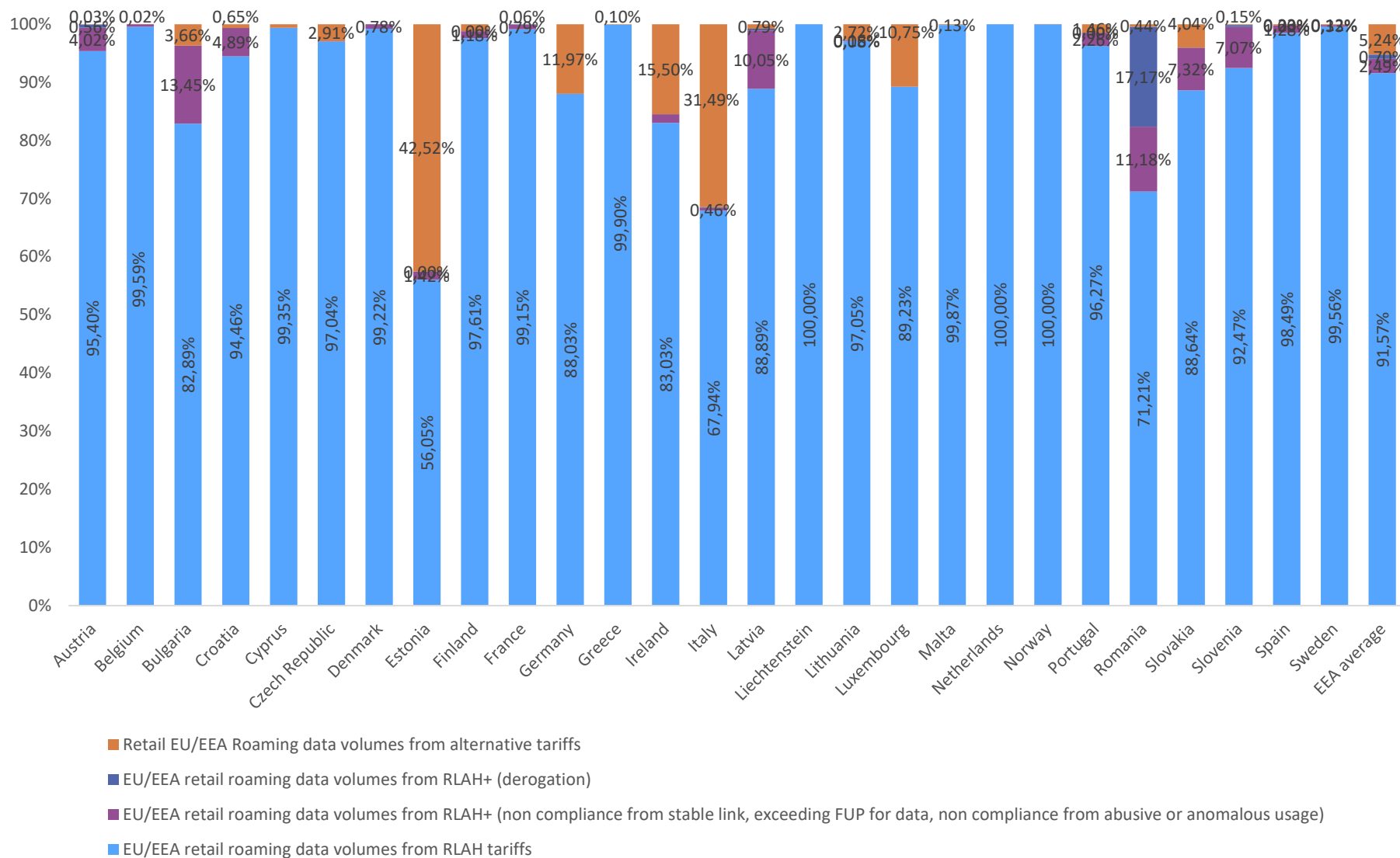
Figure 28: Proportion of balanced and unbalanced traffic within EEA countries, data services, wholesale roaming inbound, Q3 21



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 non-disaggregated estimates.

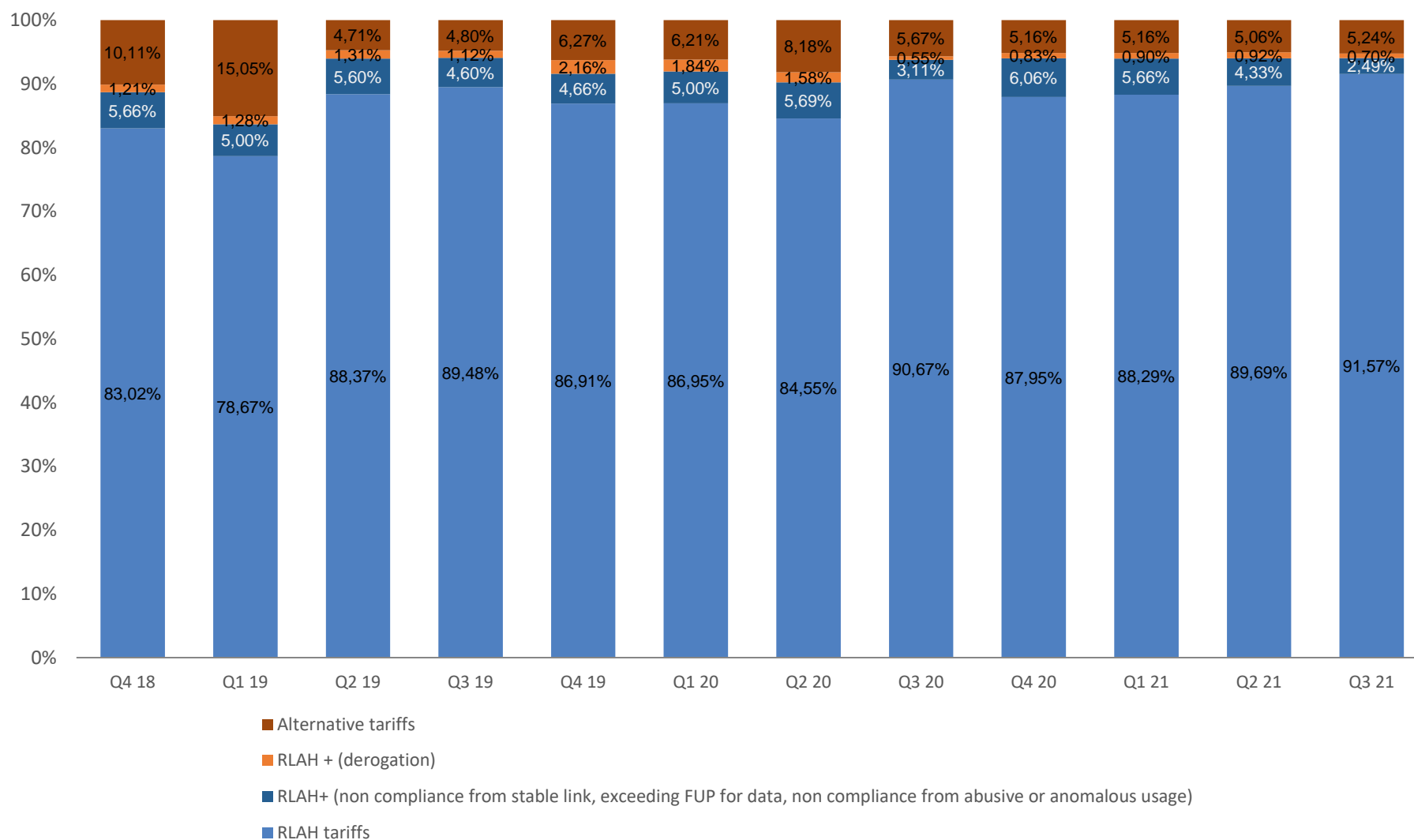
4.2.3.2 Consumption patterns

Figure 29: Percentage of retail data roaming services, Q3 21



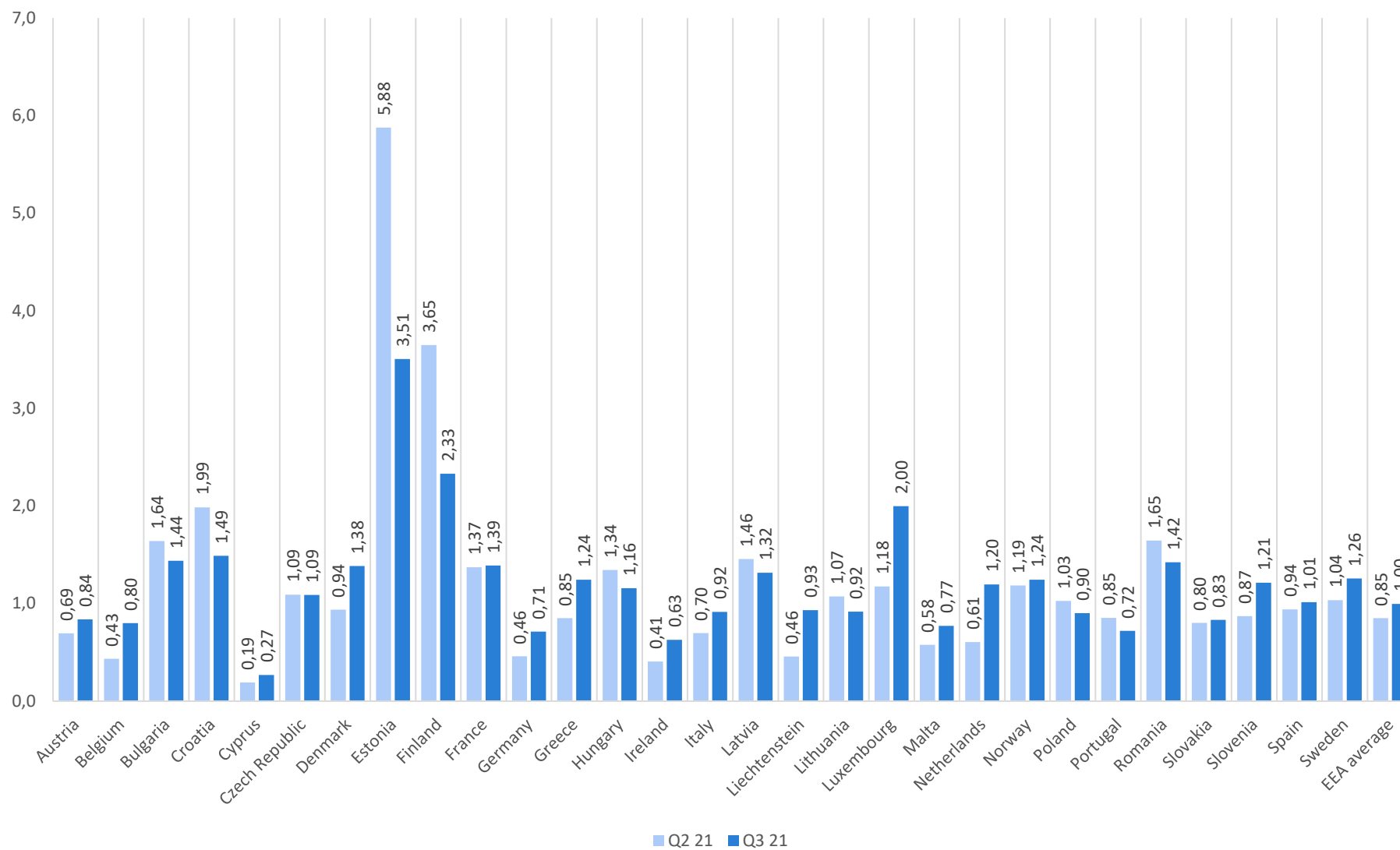
EEA average excludes: Poland

Figure 30: EEA average: percentage of retail data roaming services, Q4 18 – Q3 21



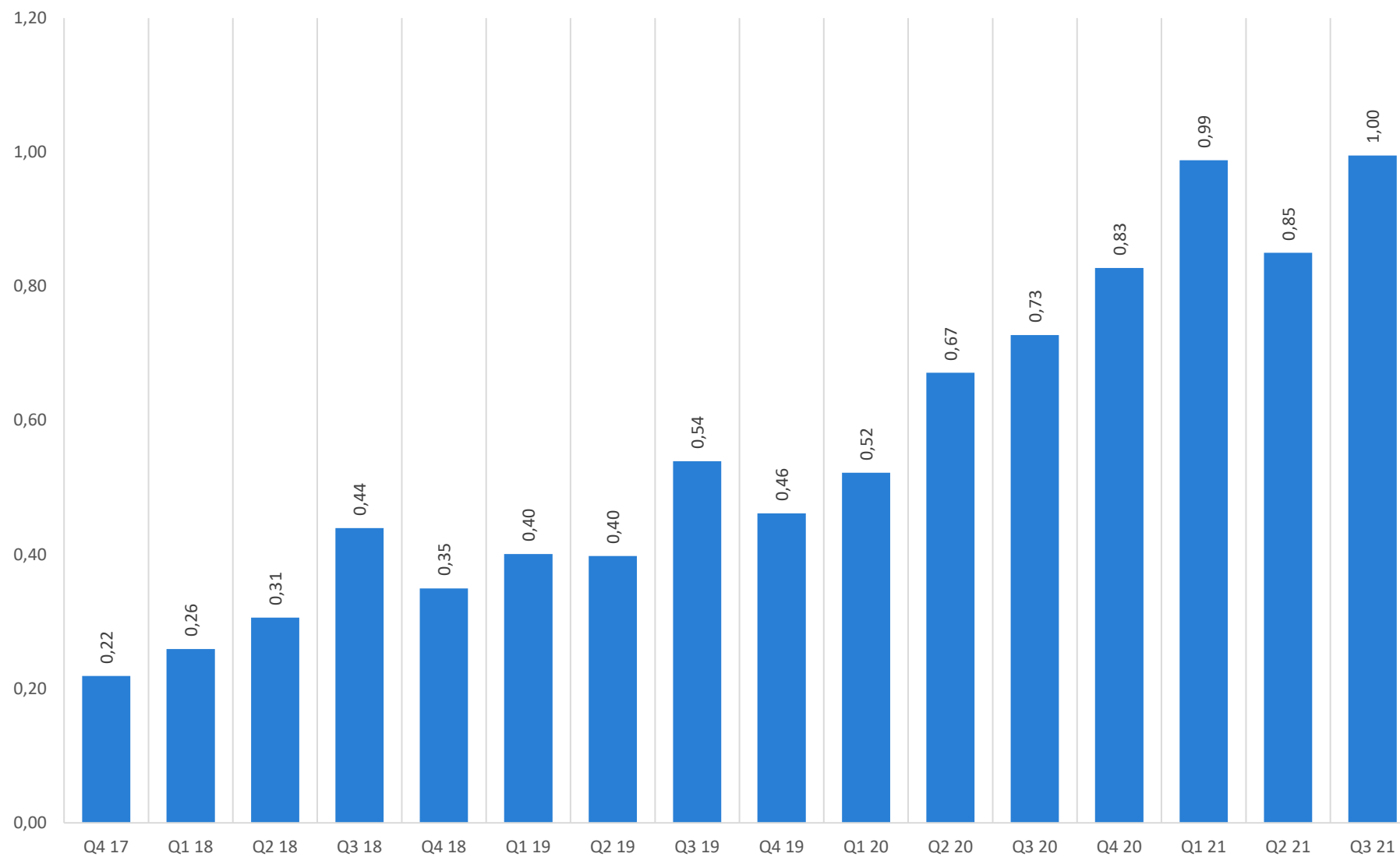
The EEA average includes United Kingdom operators' data until Q3 2019.
 EEA average (Q2 and Q3 2021) excludes: Poland

Figure 31: Average data consumption (RLAH) per month per total number of roaming subscribers (in GB), Q2 21 and Q3 21



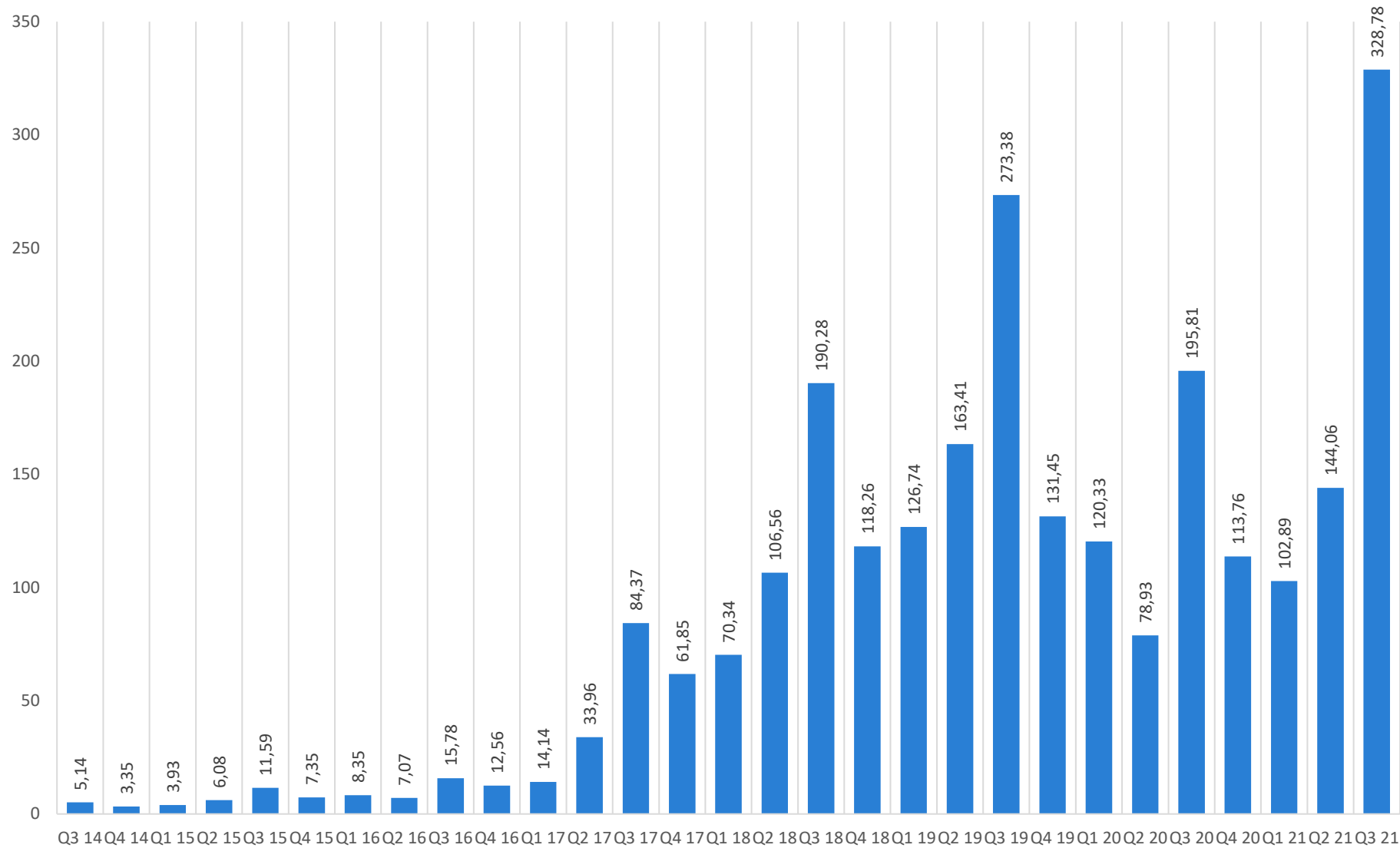
In some cases, not all operators provided the data for RLAH subscribers.

Figure 32: EEA average consumption per month per total number of roaming subscribers (in GB), Q4 17 – Q3 21



The EEA average includes United Kingdom operators' data until Q3 2019.

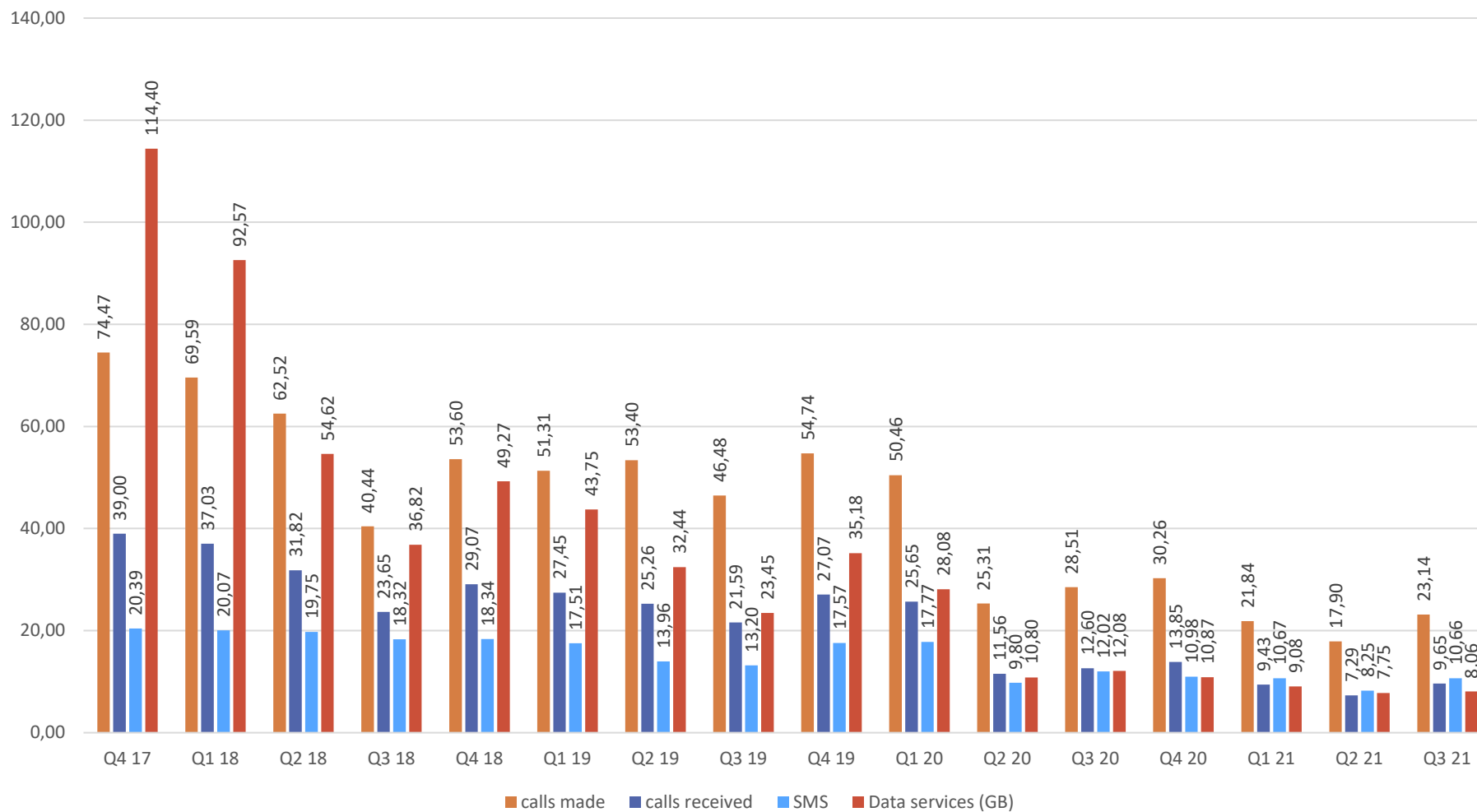
Figure 33: EEA Retail data traffic, Q3 14 – Q3 21 (millions of GB)



The EEA average includes United Kingdom operators' data until Q3 2019.

4.2.4. RoW retail roaming prices

Figure 34: EEA average retail prices for RoW roaming services, Q4 17 – Q3 21



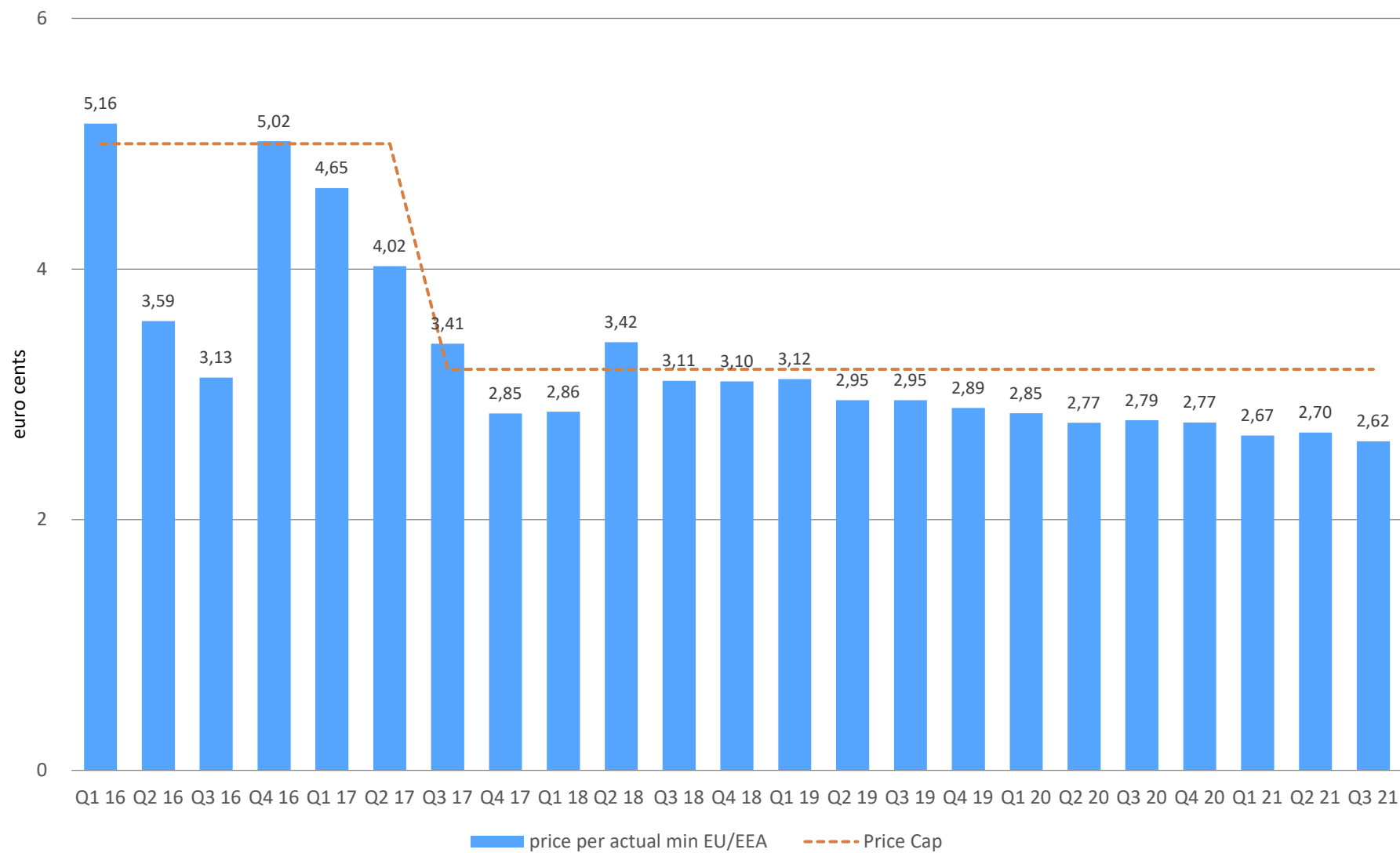
Voice and SMS services: prices are expressed in Euro cents.

Data services: prices are expressed in Euro.

The EEA average includes United Kingdom operators' data until Q3 2019.

4.3. Wholesale roaming (outbound): Agreements

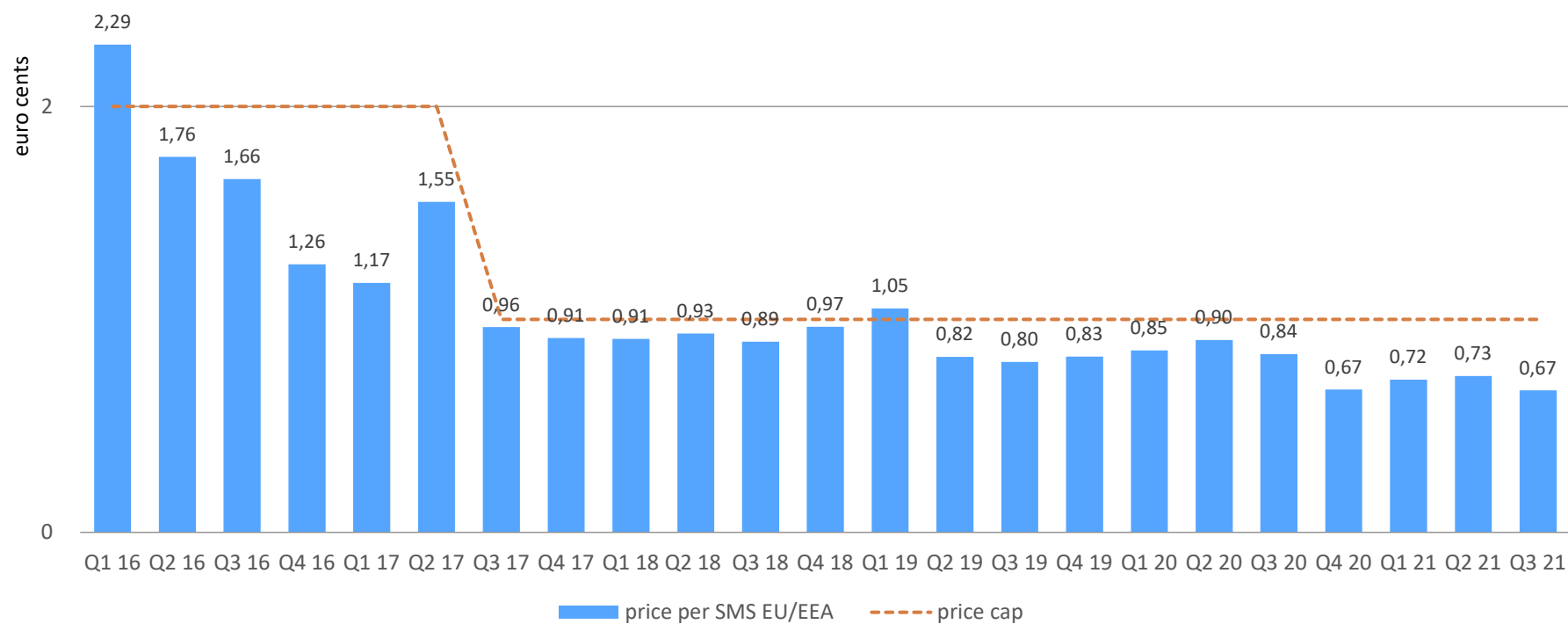
Figure 35: Wholesale averages outbound roaming: Voice: Agreements applying Article 3 Roaming Regulation, Q1 16 – Q3 21



The EEA average includes United Kingdom operators' data until Q3 2019.

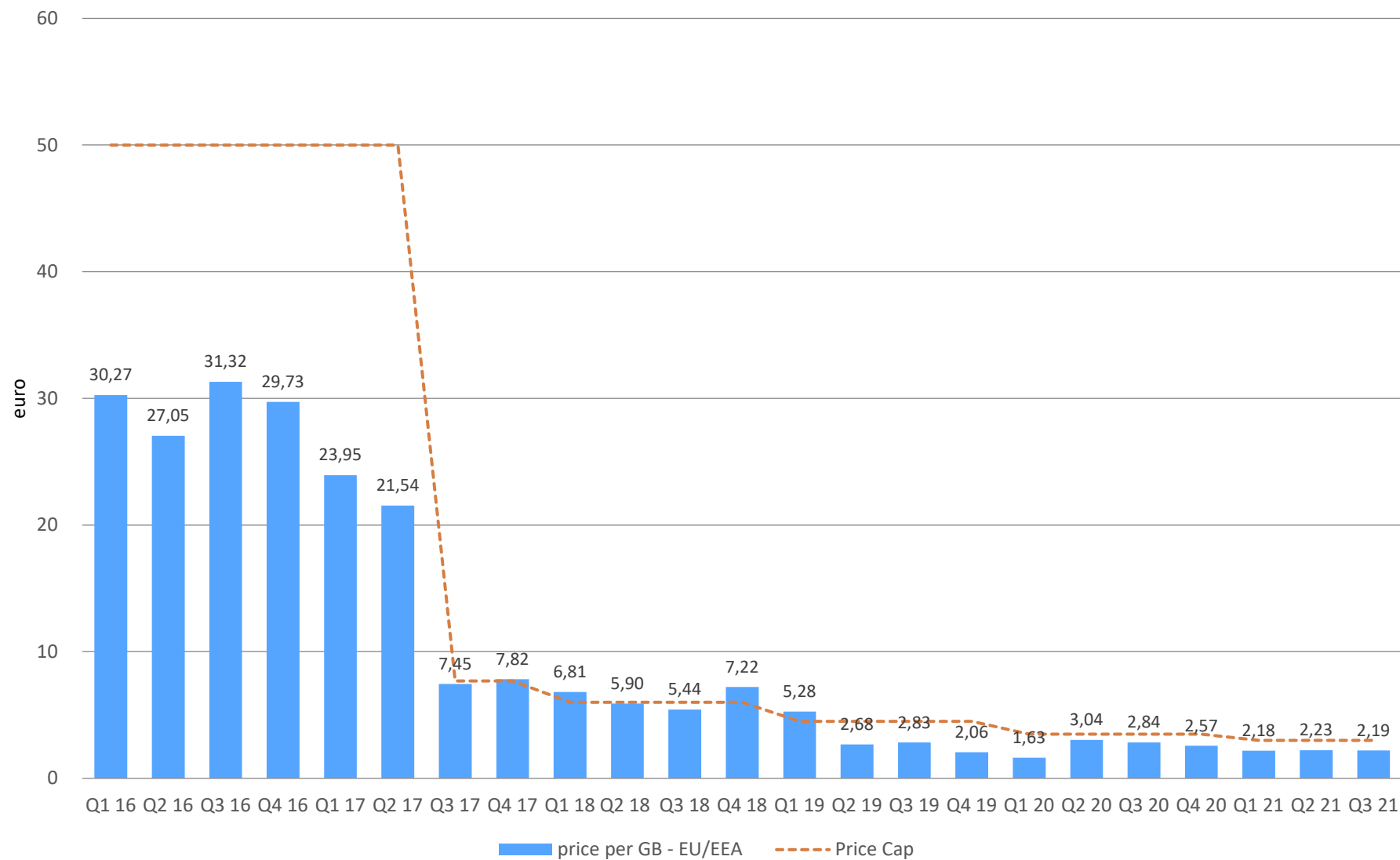
Figure 36: Wholesale averages outbound roaming: SMS Agreements applying Article 3 Roaming Regulation, Q1 16 – Q3 21

4



The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 37: Wholesale EEA average outbound roaming: Data, Agreements applying Article 3 Roaming Regulation, Q1 16 – Q3 21



The EEA average includes United Kingdom operators' data until Q3 2019.

4.4. MNOs and MVNOs data

4.4.1. Consumption patterns for domestic mobile retail services

Figure 38: Domestic data services, average consumption per month per total number of subscribers (GB), MNOs and MVNOs, Q3 21

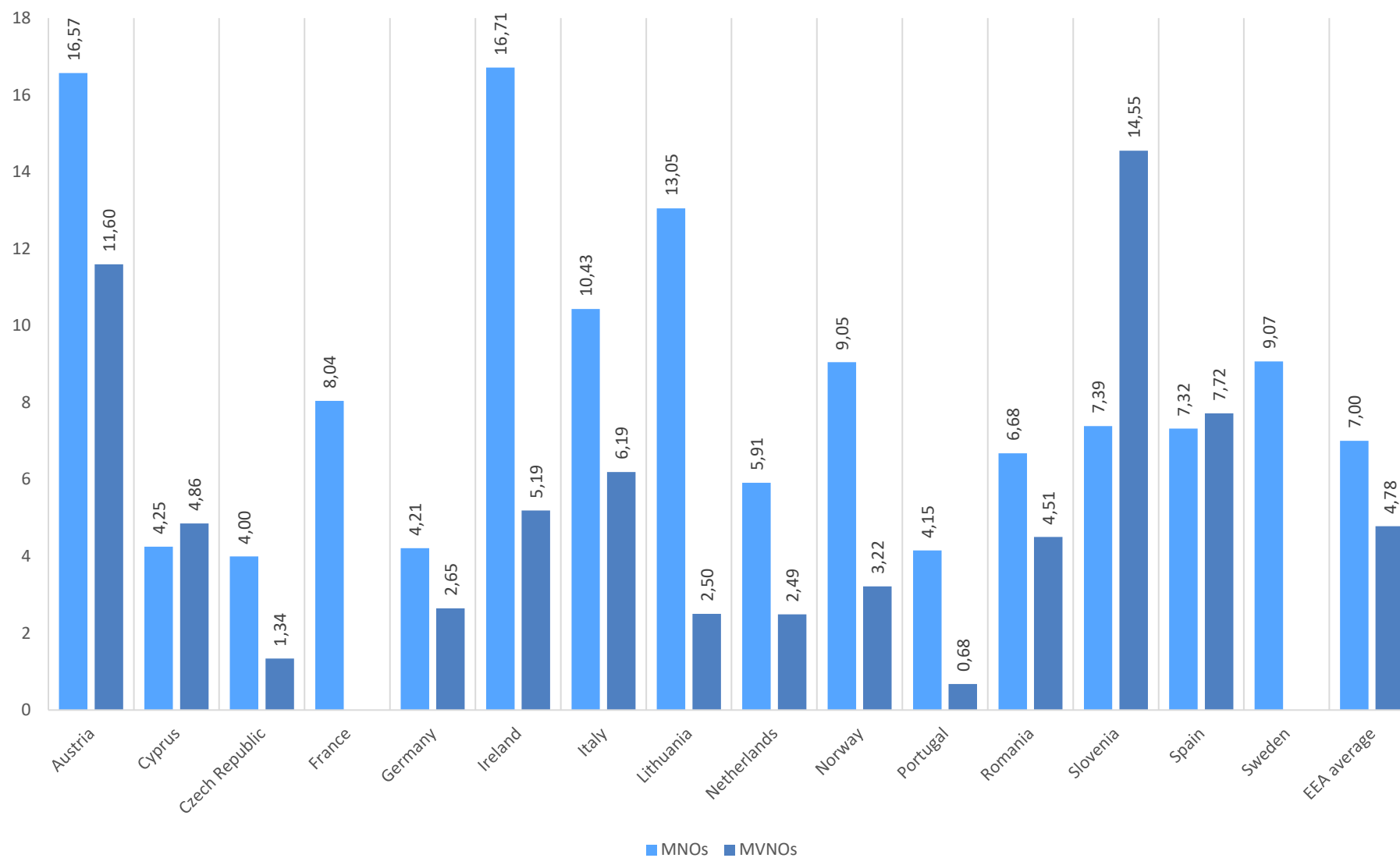


Figure 39: EEA average domestic mobile services consumption per month per total number of subscribers, Q2 21 and Q3 21

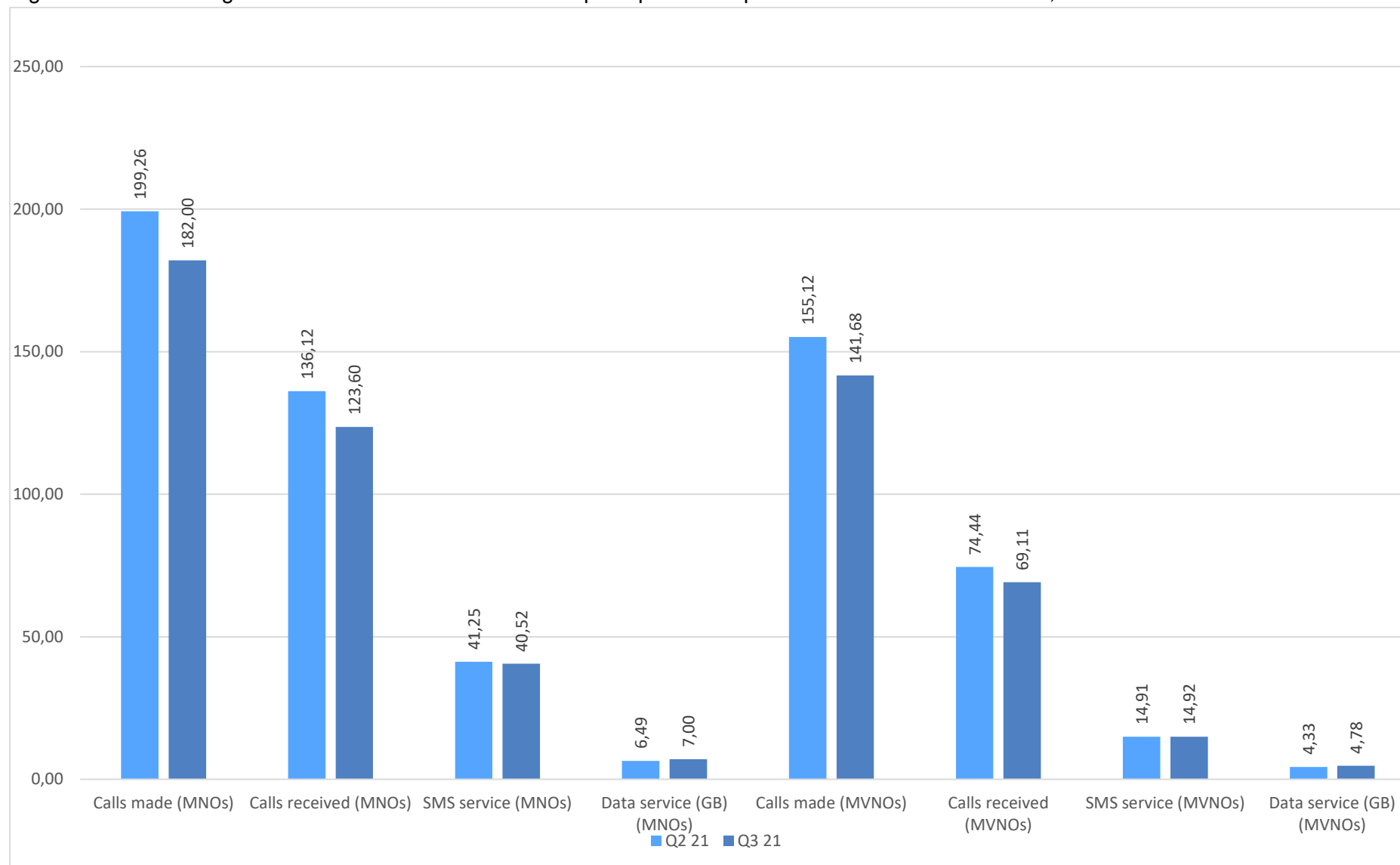


Figure 40: MNOs: share of total subscribers with EU/EEA roaming enabled, Q3 21

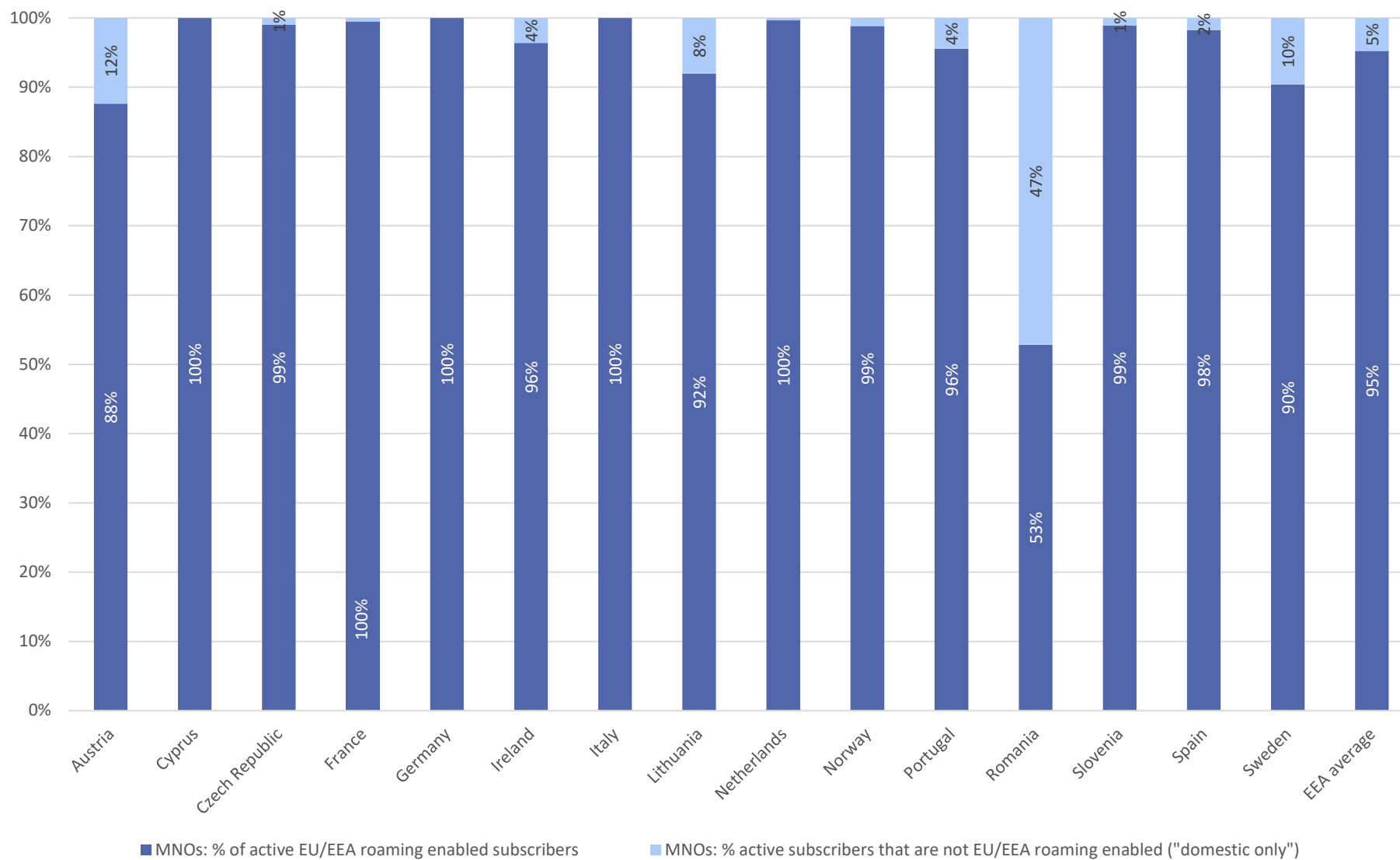
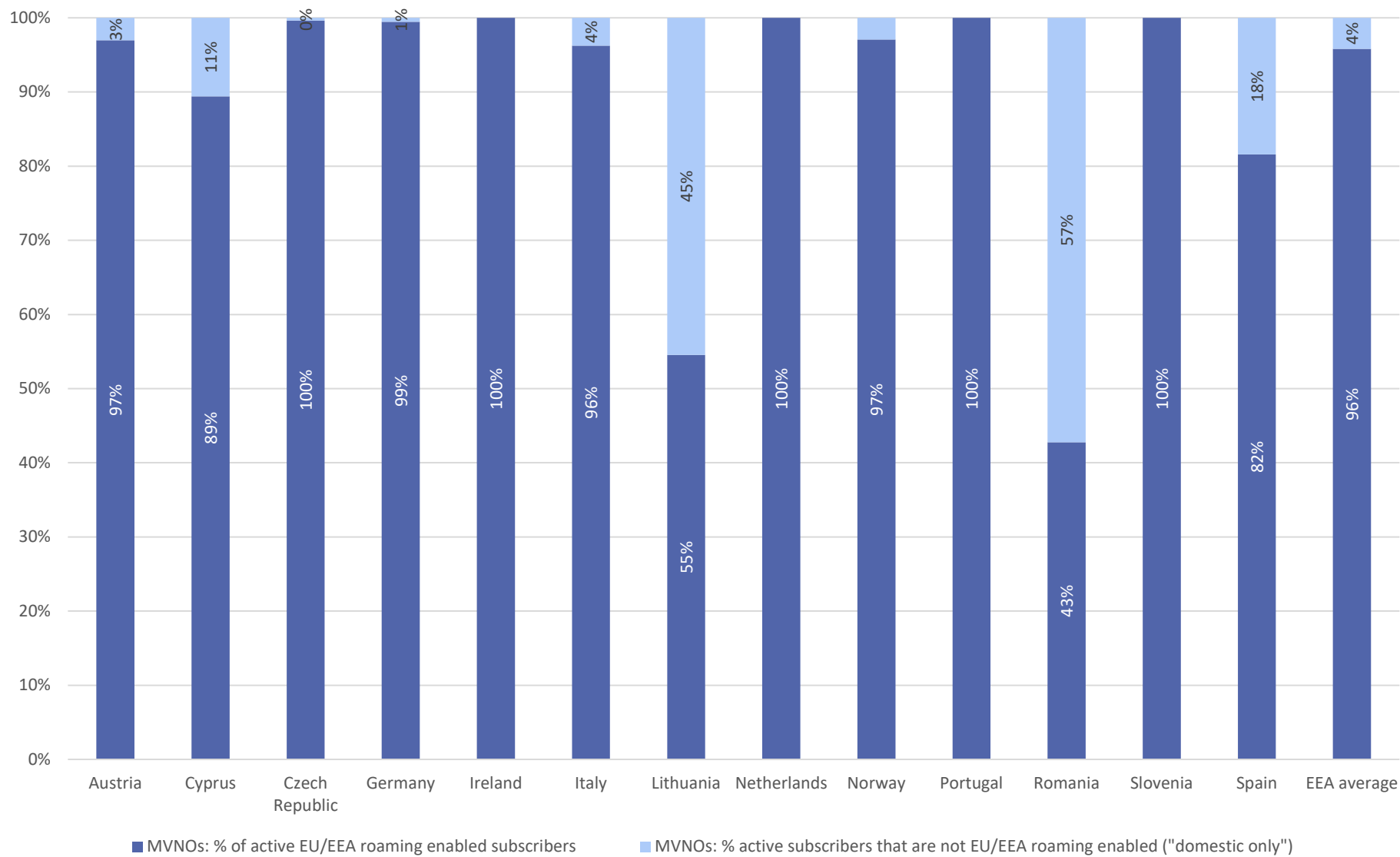
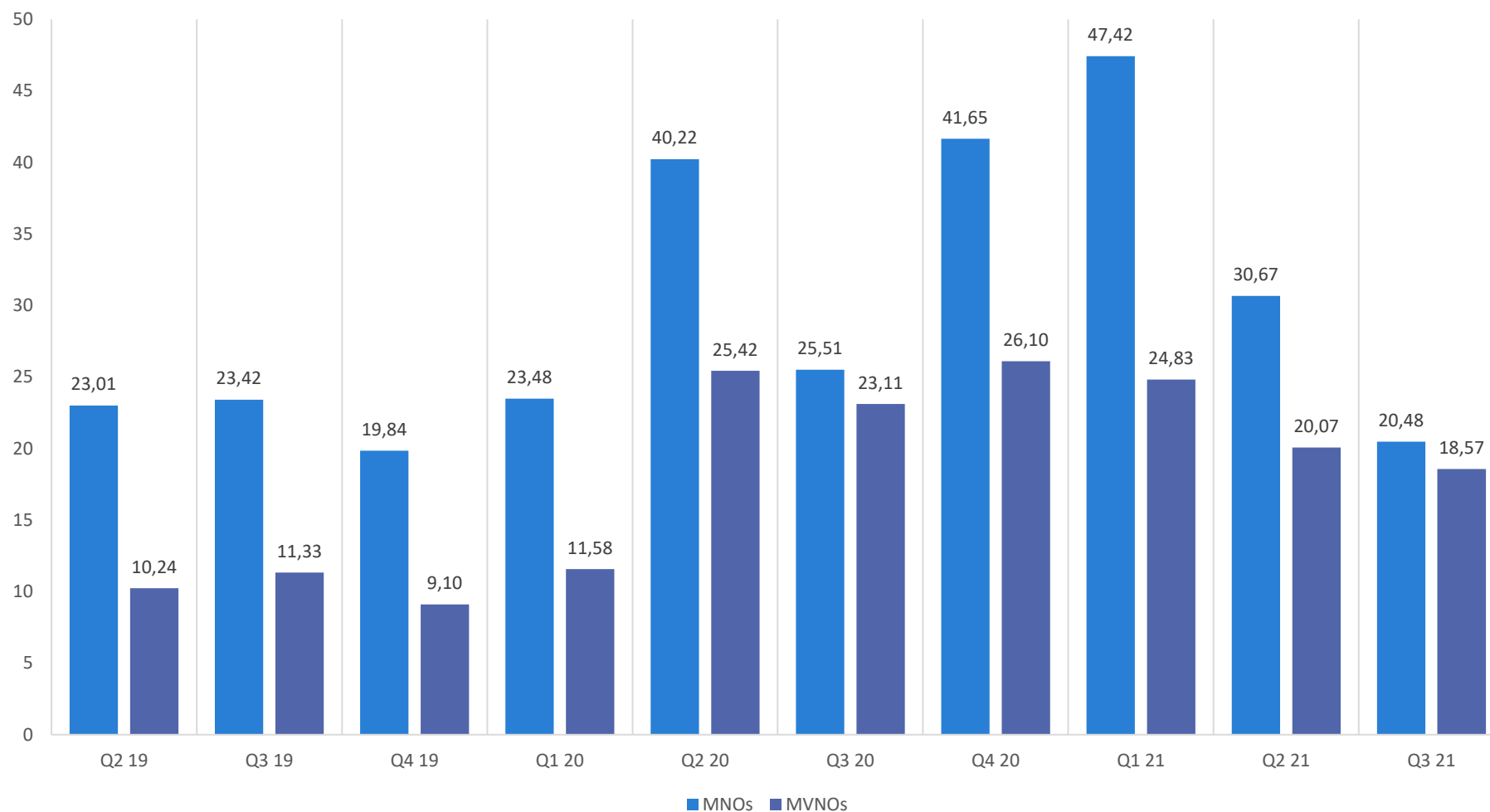


Figure 41: MVNOs: share of total subscribers with EU/EEA roaming enabled, Q3 21



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

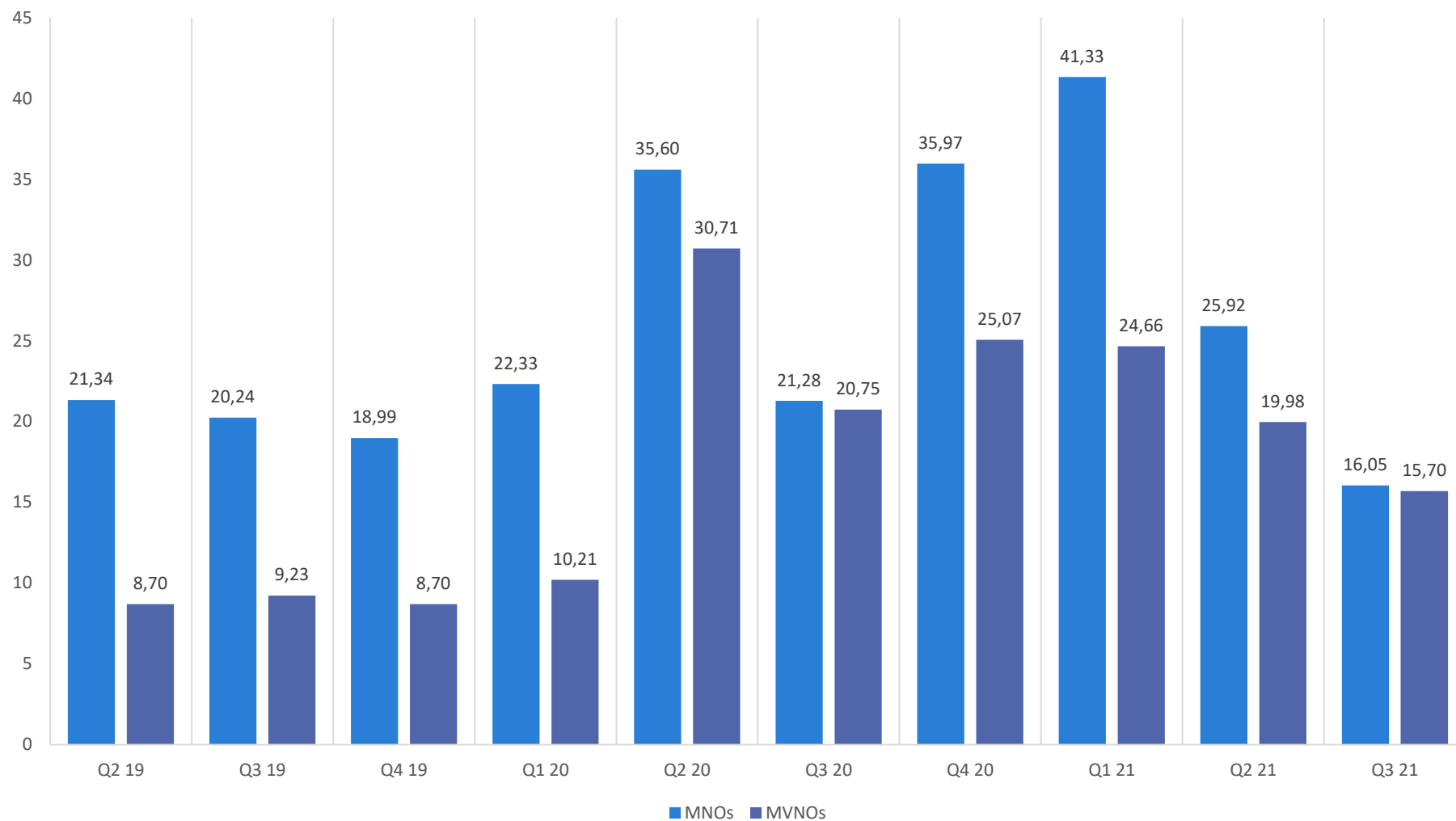
Figure 42: RLAH, calls made: EEA average number of RLAH minutes per month per roaming subscribers, MNOs and MVNOs, Q2 19 – Q3 21



BEREC changed the way it presents consumption patterns for RLAH services in order to make it easier to interpret. Since Q2 18, the indicator has been calculated by dividing RLAH volumes by number of active subscribers with RLAH services that were roaming at least once in the concerned period in the EEA. This is to ensure that period-to-period changes in the indicator are not influenced by subscribers with different tariff plans.

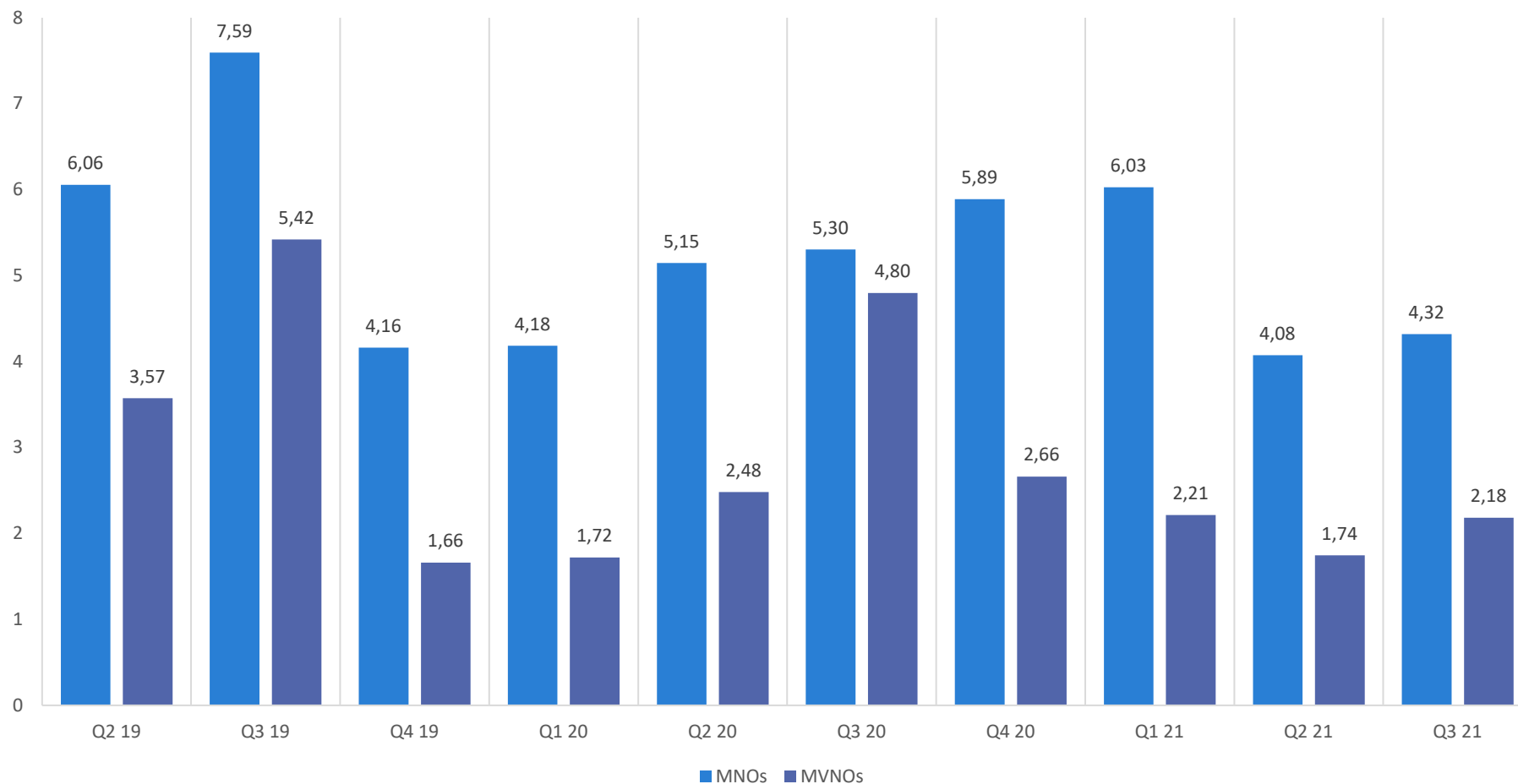
The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 43: RLAH, calls received: EEA average number of RLAH minutes per month per roaming subscribers, MNOs and MVNOs, Q2 19 – Q3 21



The EEA average includes United Kingdom operators' data until Q3 2019.

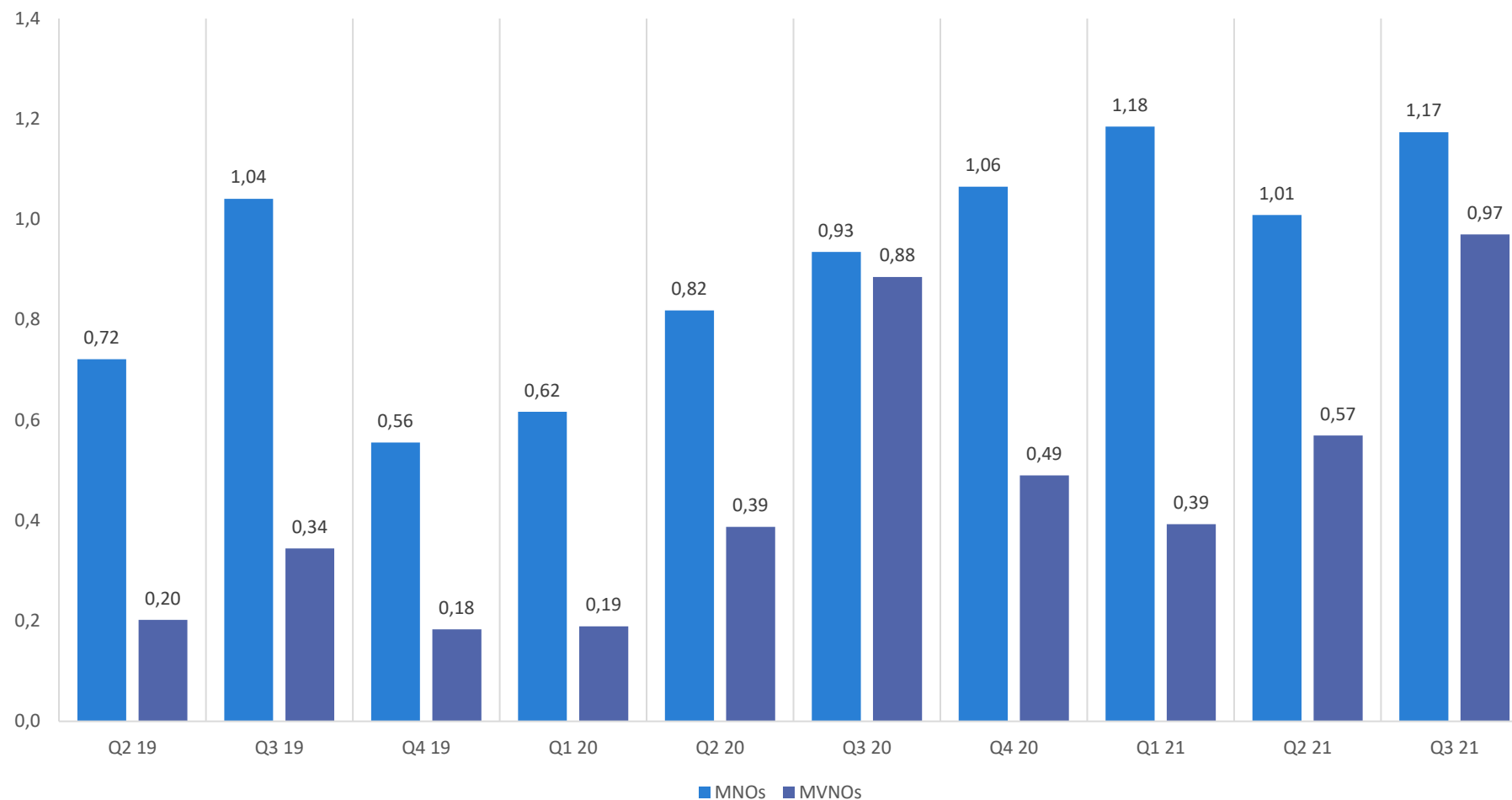
Figure 44: RLAH, SMS services: EEA average number of SMS per month per total number of roaming subscribers, MNOs and MVNOs, Q2 19 – Q3 21



BEREC changed the way it presents consumption patterns for RLAH services in order to make it easier to interpret. Since Q2 18, the indicator has been calculated by dividing RLAH volumes by number of active subscribers with RLAH services that were roaming at least once in the concerned period in the EEA. This is to ensure that period-to-period changes in the indicator are not influenced by subscribers with different tariff plans.

The EEA average includes United Kingdom operators' data until Q3 2019.

Figure 45: RLAH, data services: EEA average number of GB per month per total number of roaming subscribers, MNOs and MVNOs, Q2 19 – Q3 21

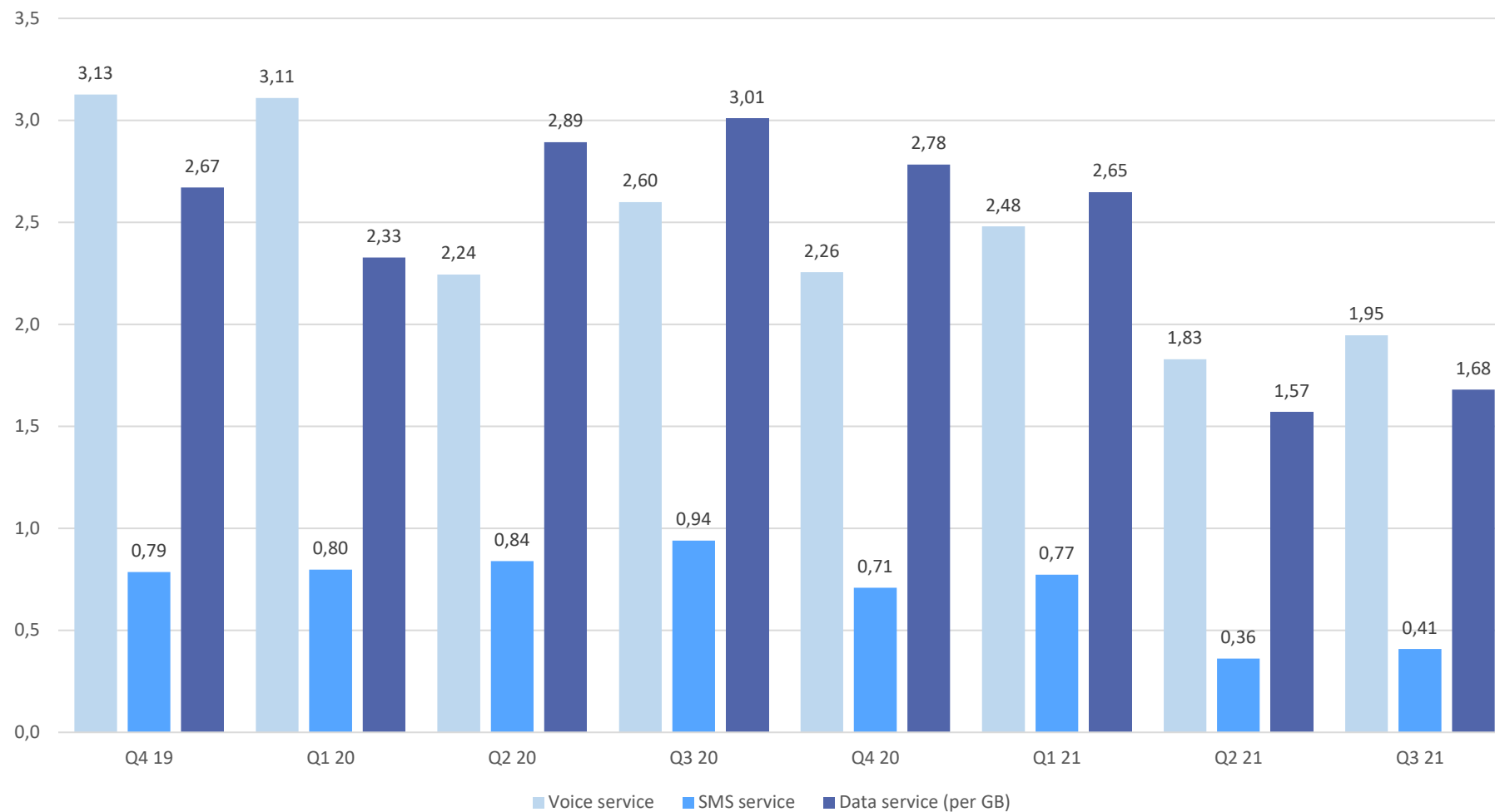


BEREC changed the way it presents consumption patterns for RLAH services in order to make it easier to interpret. Since Q2 18, the indicator has been calculated by dividing RLAH volumes by number of active subscribers with RLAH services that were roaming at least once in the concerned period in the EEA. This is to ensure that period-to-period changes in the indicator are not influenced by subscribers with different tariff plans.

The EEA average includes United Kingdom operators' data until Q3 2019.

4.4.3. Payment to the host operator for the provision of wholesale international roaming services

Figure 46: EEA average of payment to the host operator for the provision of wholesale roaming services (per unit), MVNOs, Q4 19 – Q3 21



Voice and SMS services: prices are expressed in Euro cents.

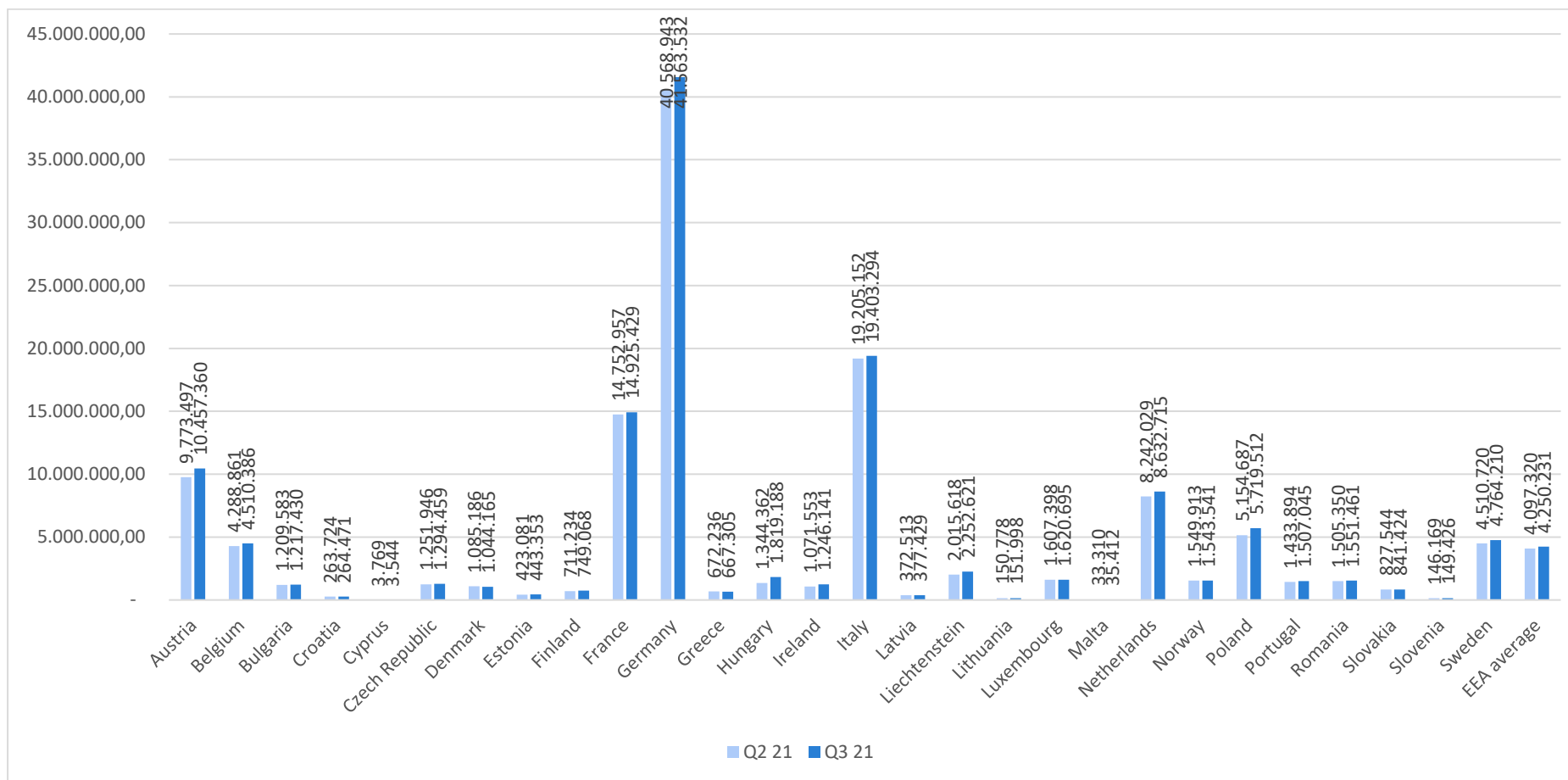
Data services: prices are expressed in Euro.

The EEA average includes United Kingdom operators' data until Q3 2019.

4.5. M2M data

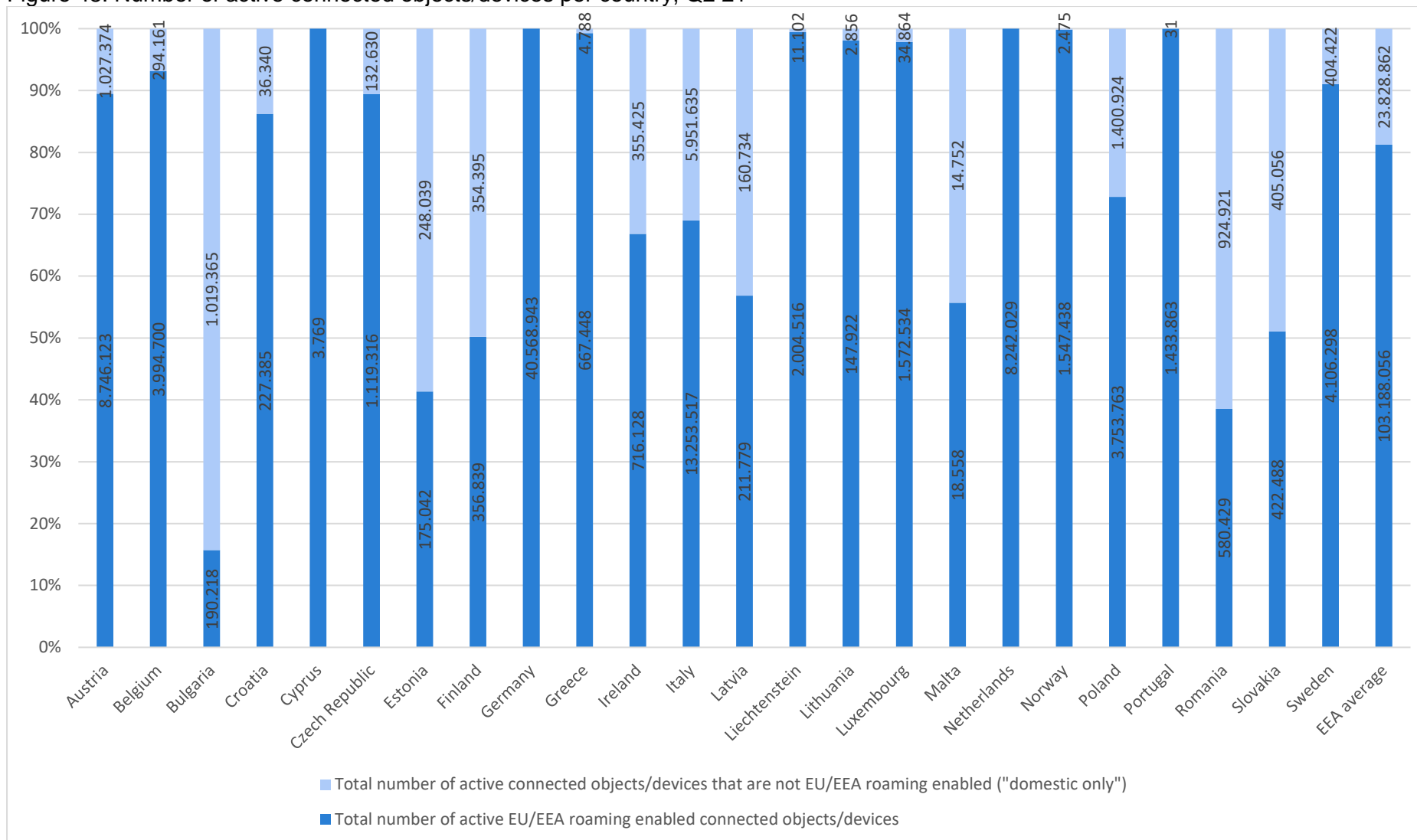
4.5.1. Connected devices

Figure 47: Number of total active connected objects/devices per country, Q2 21 and Q3 21



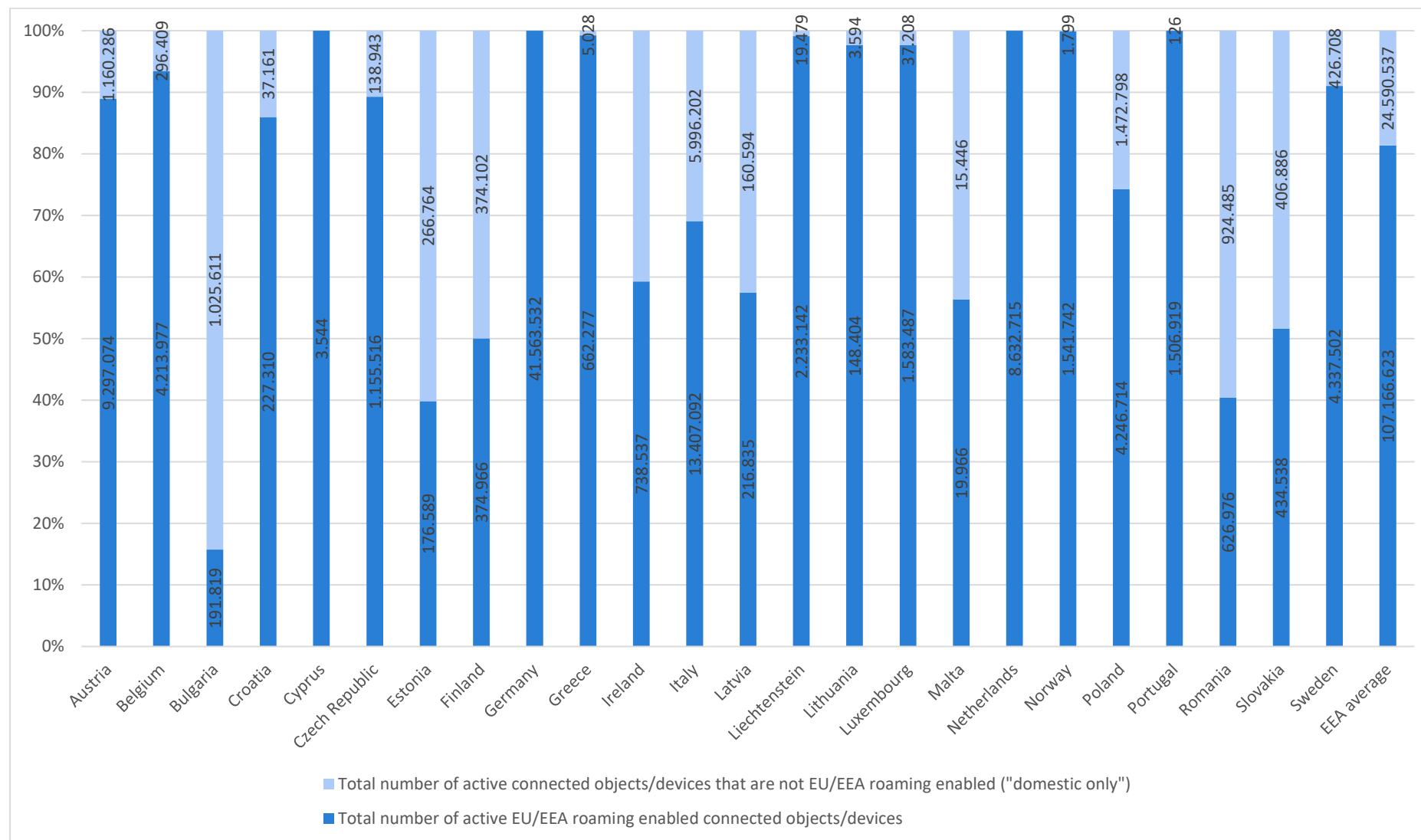
Austria – the number of operators which submitted data for the M2M section does not correspond to the number of operators in the other sections.

Figure 48: Number of active connected objects/devices per country, Q2 21



Austria – the number of operators which submitted data for the M2M section does not correspond to the number of operators in the other sections.

Figure 49: Number of active connected objects/devices per country, Q3 21



Austria – the number of operators which submitted data for the M2M section does not correspond to the number of operators in the other sections.

4.5.2. Consumption patterns (voice, data and SMS)

Figure 50: Average retail consumption per month per country for domestic data from connected devices/objects (in GB), Q2 21 and Q3 21

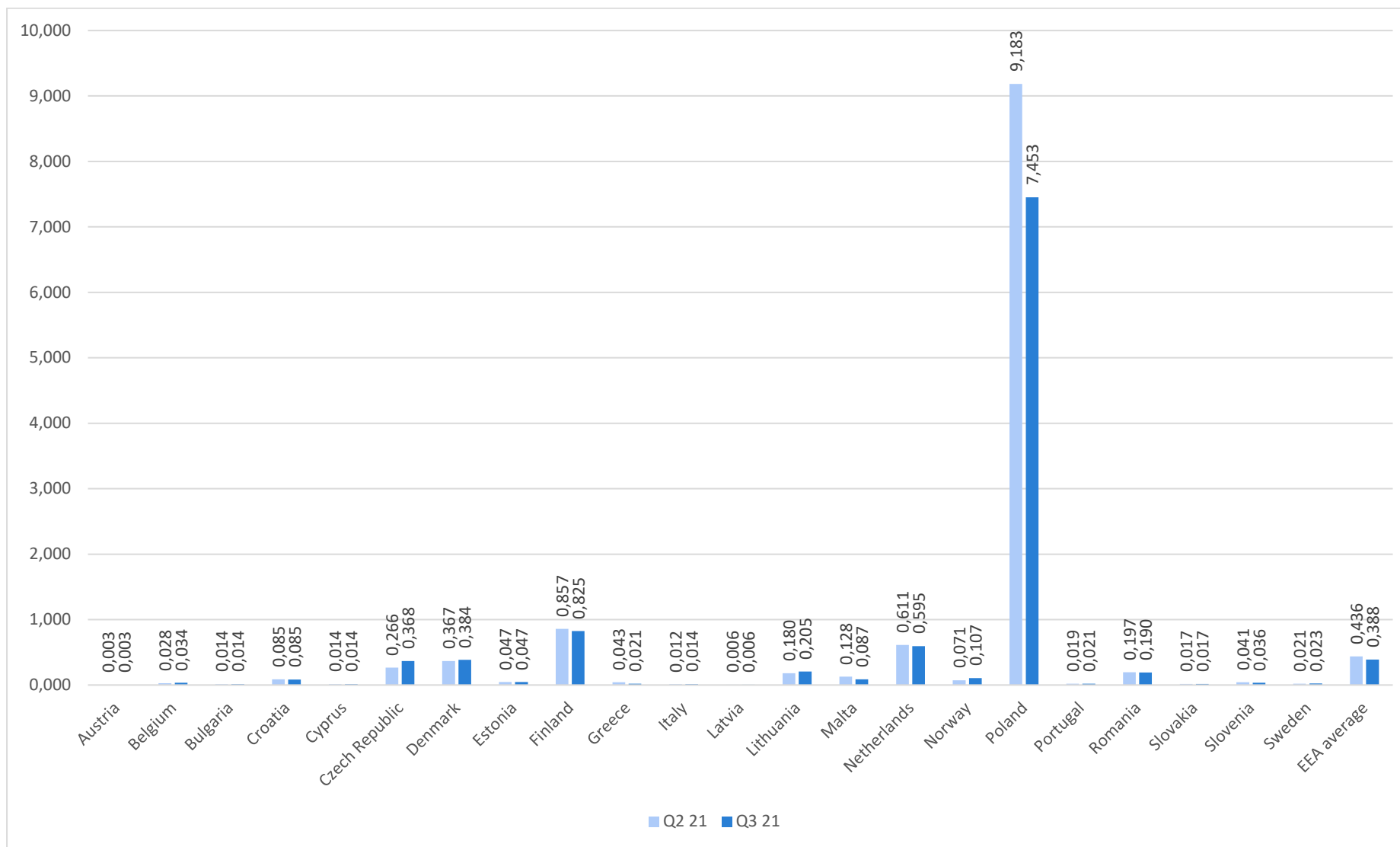


Figure 51: Average retail consumption per month per country for roaming data from active connected devices/objects that were roaming at least once in the concerned quarter in the EEA (in GB), Q2 21 and Q3 21

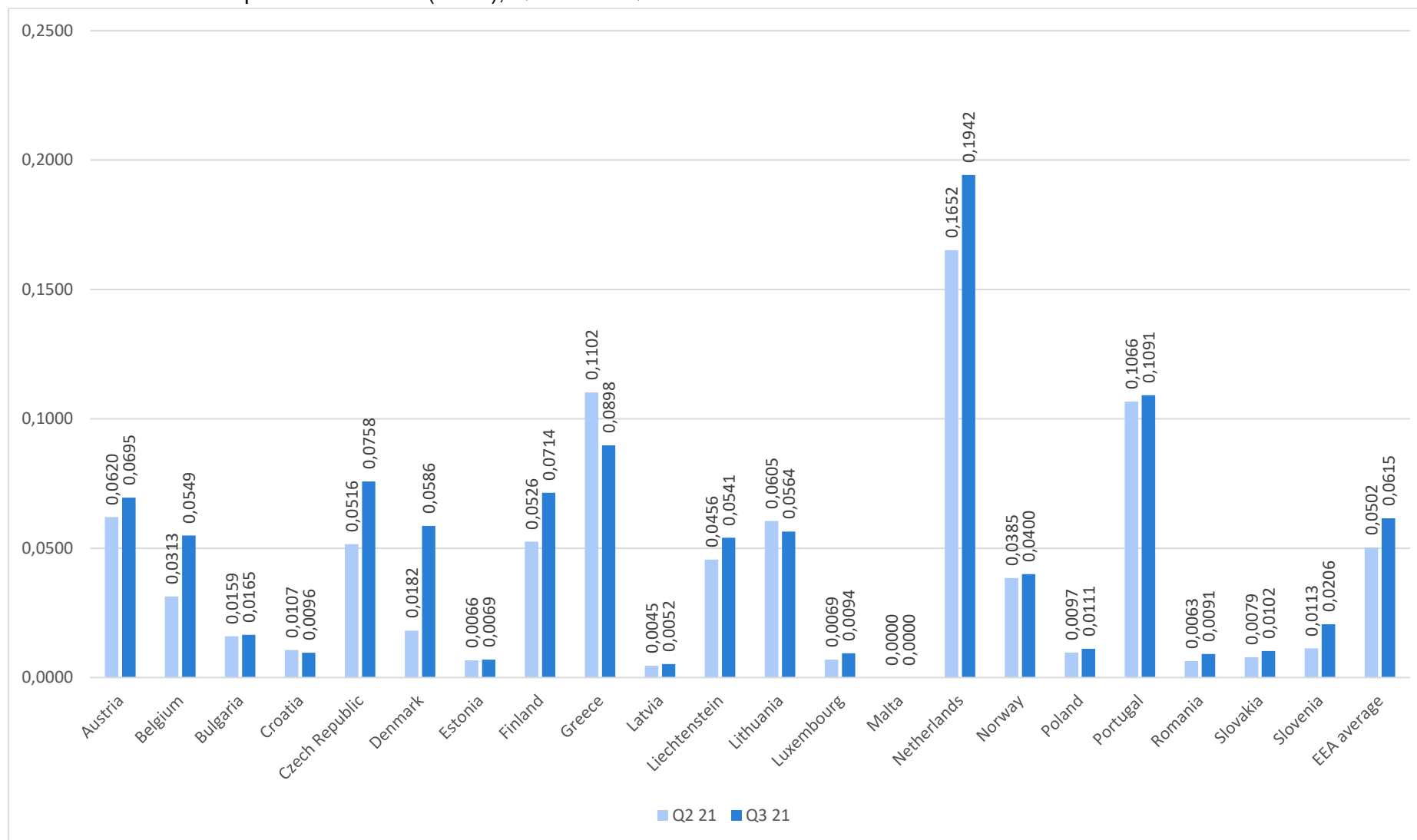


Figure 52: Average retail consumption per month per country for domestic SMS from connected devices/objects, Q2 21 and Q3 21

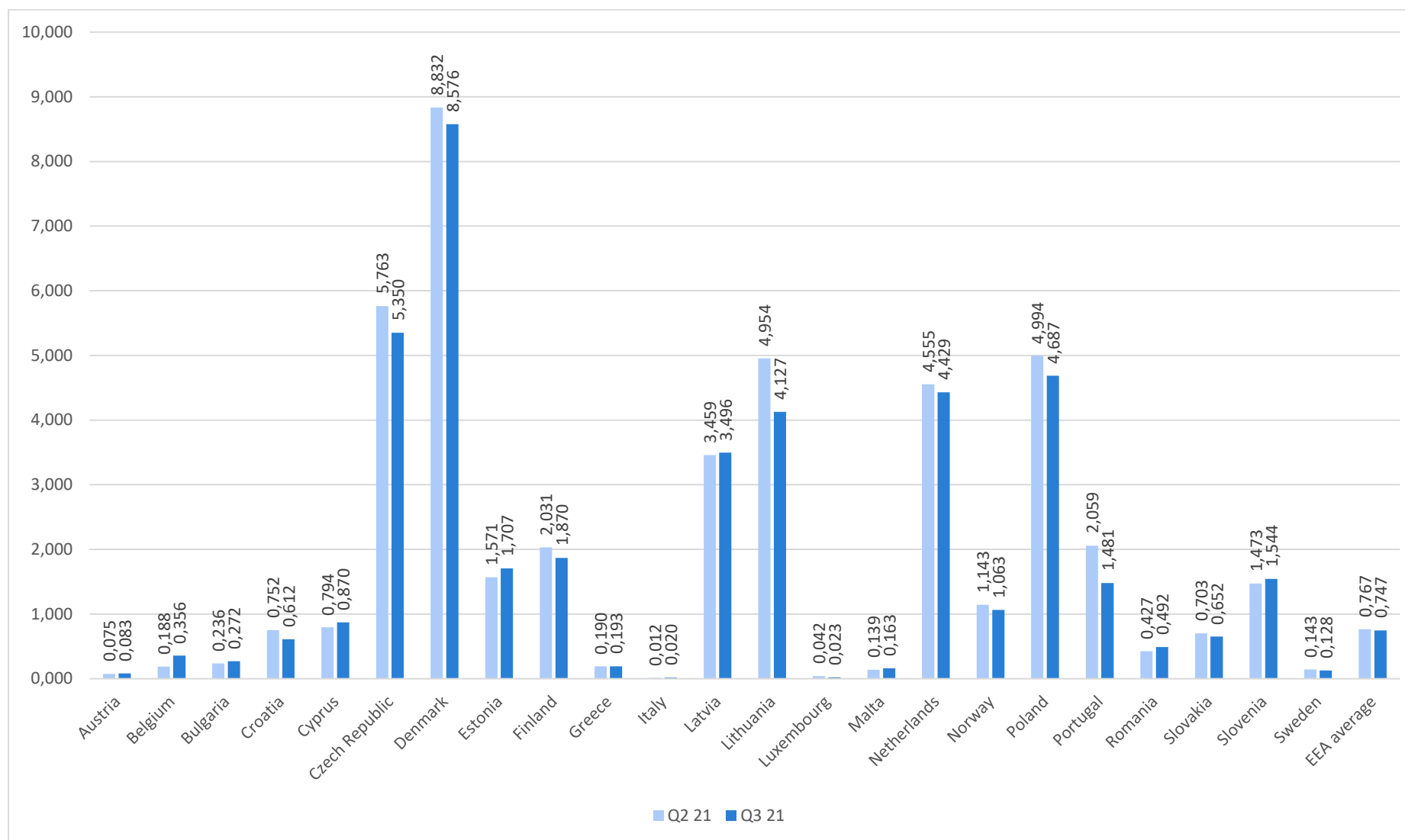


Figure 53: Average retail consumption per month per country for roaming SMS from active connected devices/objects that were roaming at least once in the concerned quarter in the EEA, Q2 21 and Q3 21

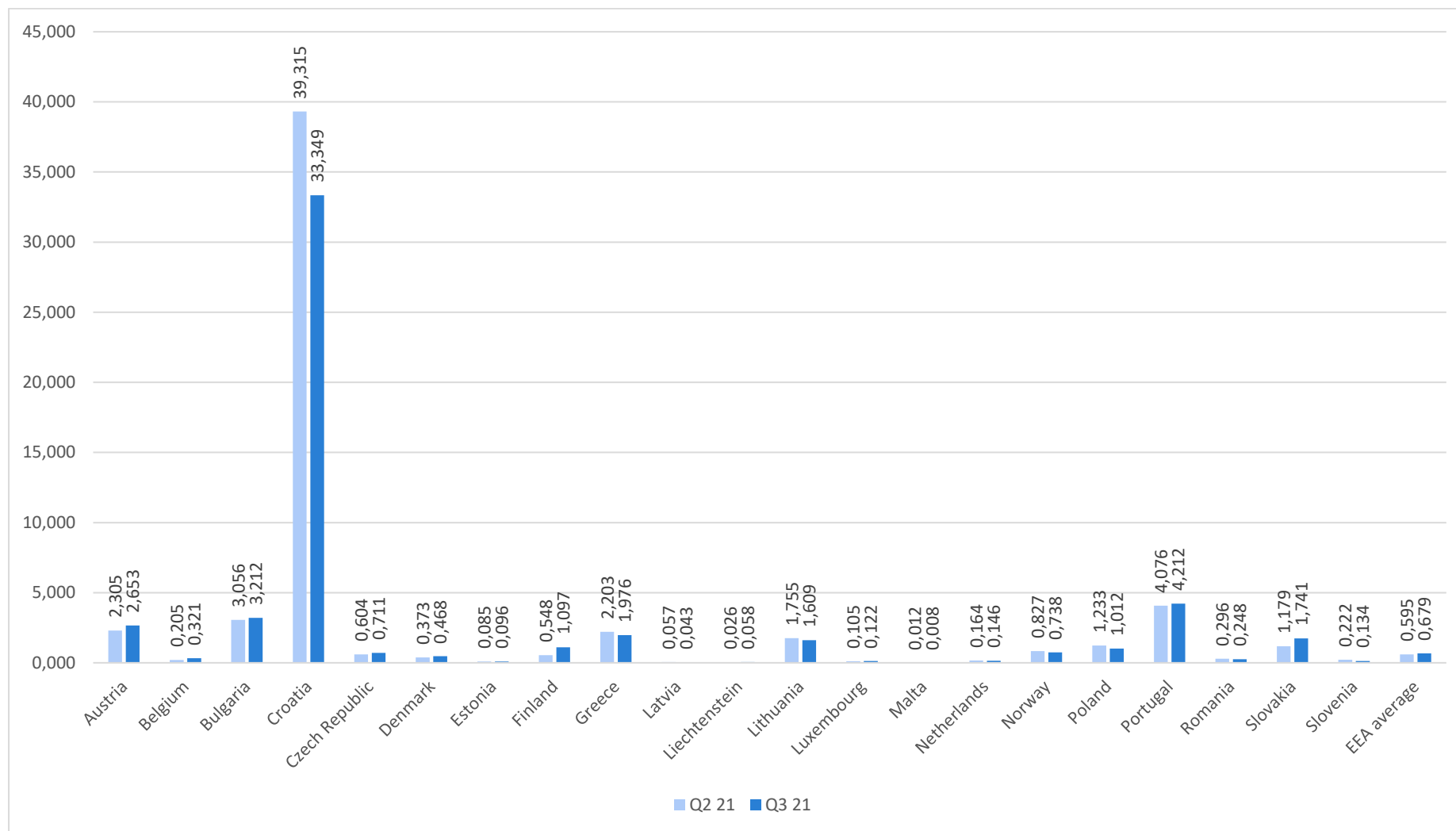


Figure 54: Average retail consumption per month per country for domestic calls made from connected devices/objects, Q2 21 and Q3 21

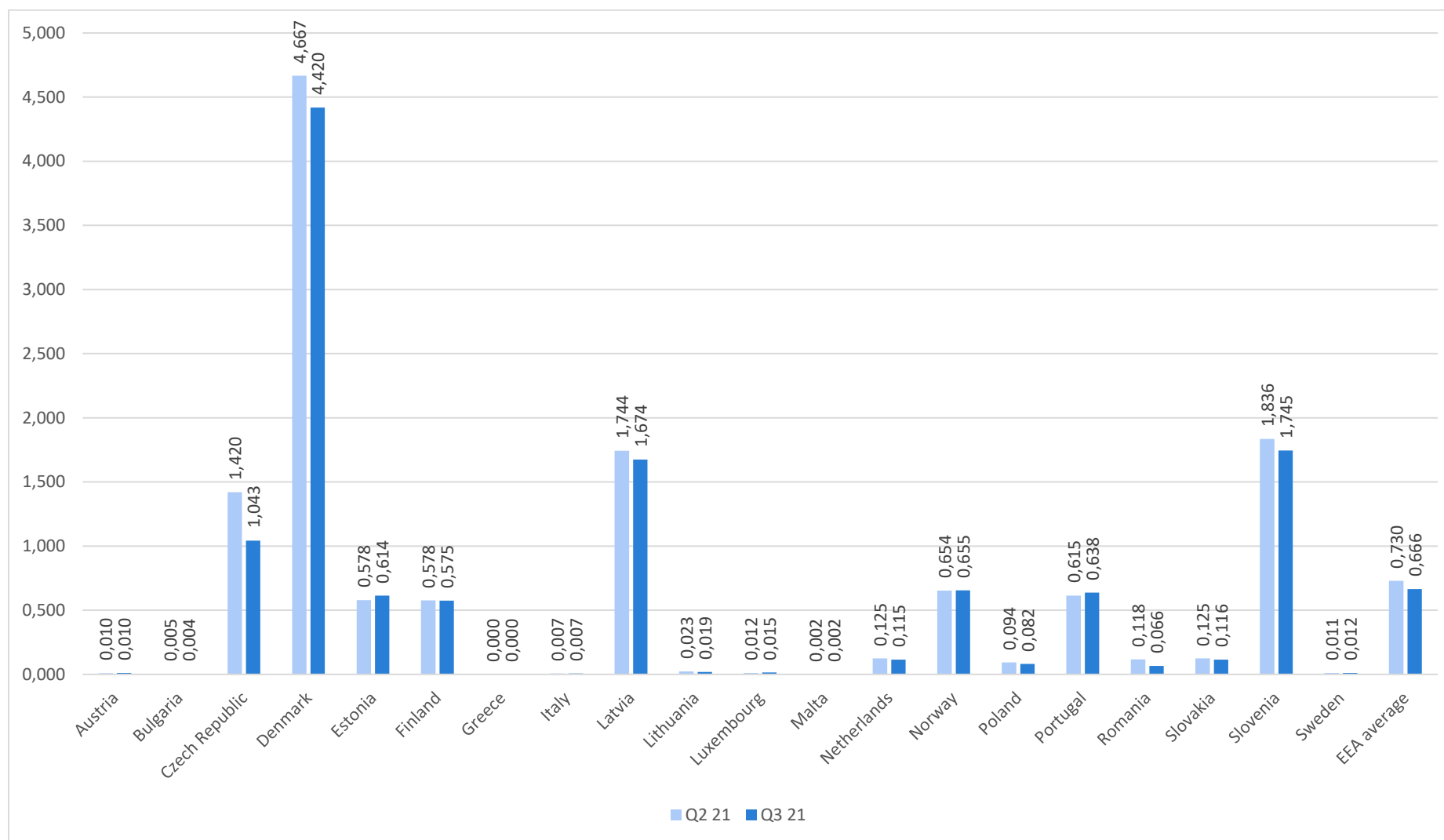
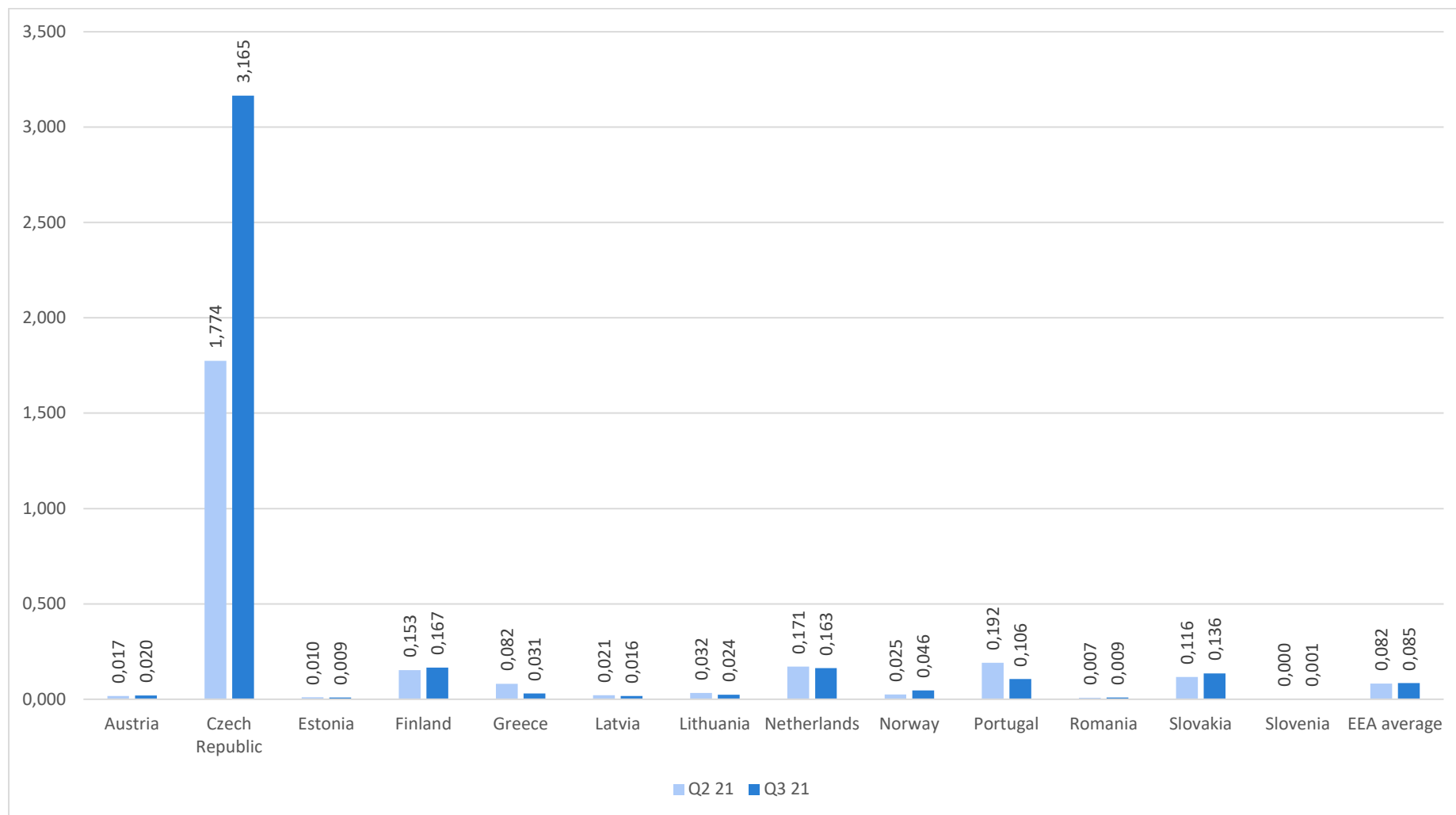


Figure 55: Average retail consumption per month per country for roaming calls made from active connected devices/objects that were roaming at least once in the concerned quarter in the EEA, Q2 21 and Q3 21



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: 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 in excess of the limits of the FUP or if roaming is not periodic (RLAH+, non-compliance from abusive or anomalous usage);
- 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);
- Difficulties in differentiating between domestic-only and intra-EEA: due to the introduction of Roam Like at Home rules, it has become difficult to determine the part of the domestic revenues only relative to intra-EEA roaming communications for these bundled tariff plans. For these tariffs, it is only possible to separate the revenues relative to the roaming surcharge applied (e.g. when the roaming Fair Use Policy is exceeded).

In consideration of these difficulties, the report made use of the following assumptions:

- 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). Thus, 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 contained, despite the difficulties in allocating the revenues only relative to mobile services. Revenues from international mobile calls/SMS may 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”).

While the measurement of balanced and 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.

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.

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 apparent changes in volumes and revenues between quarters.

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 may slightly affect the accuracy of data.

All retail prices included in the charts 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 GB 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 paragraph 3. Prices may thus be higher than the price caps given in Article 7 (1), Article 9 (1) and Article 12 (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).

The EU Roaming Regulation also applies to the EEA EFTA States Norway, Iceland and Liechtenstein and this Report includes indicators from Norway and Liechtenstein.

Specifically regarding M2M data it is worth mentioning that the data is not quite comprehensive in this third data collection. In fact, several operators reported that they are still adapting their systems to extract this data.

Annex II: Regulatory evolution

The 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 the ERG.

The 2007 Regulation

In 2005, the 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. The 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 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 2007¹⁶.

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.^{17,18}

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.

And from July 2010 to June 2012:

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

¹⁶ In Norway and Iceland the 2007 Regulation was in force from the end of 2007 to the 2nd quarter 2010.

¹⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:167:0012:0023:EN:PDF>.

¹⁸ 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.

The 2012 Regulation

On 30 May 2012 the Council of the European Union approved the International Roaming Regulation III,¹⁹ which entered into force on 1 July 2012.²⁰

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;
- extension of safeguard mechanisms. 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.

Regulation (EU) No. 2015/2120,²¹ 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. 531/2012,²² the main one being the principle of Roam Like At Home, i.e.

¹⁹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:172:0010:0035:EN:PDF>.

²⁰ 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.

²¹ Available at: <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32015R2120>.

²² Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012R0531>.

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 where the roaming provider is allowed to apply surcharges (e.g. when a Fair Use Policy (FUP) under the conditions of the Roaming Regulation is breached or a data volume limit is exceeded). Moreover, according to Article 6c of the 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 the 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).²³ 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 further be mentioned that the Roaming Regulation also established a transitional period, from the 30 April 2016 to 14 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 therefore included 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.

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

Regulation (EU) No. 2017/920²⁴ 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. 531/2012,²⁵ 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 collect data about the evolution of actual wholesale roaming rates for unbalanced traffic

²³ The 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) are available at: http://berec.europa.eu/eng/document_register/subject_matter/berec/regulatory_best_practices/guidelines/7005-berec-guidelines-on-regulation-eu-no-5312012-as-amended-by-regulation-eu-no-21202015-excluding-articles-3-4-and-5-on-wholesale-access-and-separate-sale-of-services.

²⁴ Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R0920>.

²⁵ Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012R0531>.

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.

Annex III: List of respondents

Operators that provided data for the period 1 April 2021 – 30 September 2021:

Austria

A1 Telekom Austria
Cubic Telecom
HoT Telekom
Hutchison 3G Austria
Kabelplus
LTK
Lycamobile
Mass Response
MTEL
Porsche Smart Mobility
RTK
Russmedia
T-Mobile Austria
Vectone Mobile

Belgium

Proximus
Telenet Group
Lycamobile
Orange Belgium
Voo
Mobile Vikings

Bulgaria

Bulgarian Telecommunication Company
(Vivacom)
Telenor Bulgaria
A1 Bulgaria

Croatia

Hrvatski Telekom
A1 Hrvatska
Telemach

Cyprus

Cablenet
Cyta
EPIC
Primetel

Czech Republic

O2 Family
ČEZ Prodej

O2 Czech Republic

Tesco Mobile ČR

T-Mobile Czech Republic

Vodafone Czech Republic

SAZKAmobil

Denmark

Hi3G Denmark

Nuuday

Telenor

TeliaDanmark

Estonia

AS EMT

Elisa Eesti

TELE 2 Eesti

Finland

Ålands Telekommunikation

DNA

Elisa Corporation

Telia Finland

European Mobile Operator (MOI)

France

Bouygues Telecom

Bouygues Telecom Business Distribution

Free Mobile

Lycamobile

Orange Caraïbe

Orange France

SFR

SRR

Germany

Telekom Deutschland GmbH

Telefónica Germany GmbH & Co. OHG

Vodafone GmbH

1&1

Freenet

Lycamobile

Greece

COSMOTE Mobile
 Vodafone Panafon
 Wind HellasTelecommunications

Hungary

Telenor Magyarország Zrt.
 Magyar Telekom Nyrt.
 Vodafone Magyarország Zrt.
 Digi Kft.

Ireland

Eircom Limited
 Hutchison 3G Ireland
 Lycamobile Ireland Limited
 Tesco Mobile Ireland
 Vodafone Ireland
 Virgin Media Ireland Limited

Italy

Digi Italy
 ERG Mobile
 Iliad
 Fastweb
 Tre (Windtre)
 Kena Mobile
 Lycamobile
 Nextus
 Noitel
 Optima
 Poste Pay
 Tim
 Tiscali
 Vodafone
 Wind (Windtre)

Latvia

Bite Latvia
 LatvijasMobilaisTelefons
 Tele2

Liechtenstein

Salt (Liechtenstein)
 Telecom Liechtenstein
 Swisscom (Schweiz)
 Datamobile
 Cubic Telecom
 Soracom Corporation
 Emnify

Telecom North America
 Globalmatix

Lithuania

Bite Lietuva
 Eurocom
 Telia Lietuva
 Tele2
 Teledema

Luxembourg

POST
 Proximus Luxembourg
 Orange Communications Luxembourg

Malta

Melita Mobile,
 Mobisile Communications (GO Mobile)
 Epic Communications Ltd Malta

Netherlands

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

Norway

Ice
 Fjordkraft
 Lycamobile
 Telenor
 Telia Norge

Poland

P4
 Polkomtel
 T-Mobile Polska
 Orange Polska
 Lycamobile
 Premium Mobile
 Virgin Mobile

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

Romania

Orange Romania
RCS&RDS
Vodafone Romania
Lycamobile
Telekom Romania Communications
Telekom Romania Mobile Communications

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

Digi Spain Telecom, S. L.
Euskaltel, S. A.
Orange Espagne, S. A. Unipersonal
Telefónica Móviles de España, S. A.
Unipersonal
Vodafone Espana, S. A. Unipersonal
Xfera Móviles, S. A. Unipersonal (Yoigo)

Sweden

Hi3G Access
Telenor Sverige
Telia Company
Tele2 Sverige