

Pricing analysis of potential market values of 1 MHz
frequencies in the range:
700 MHz, 800 MHz, 2100 MHz, 2600 MHz, 3400-3800 MHz

Georgian National Communications Commission



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1. Transmittal letter

To: Georgian National Communications Commission

5 August, 2024

In accordance with Agreement No. 2207/01-24 (the Agreement) with Georgian National Communications Commission ("ComCom", the "Client" or the "Company") dated July 22, 2024 EY LLC ("we" or "EY") has performed a pricing analysis to determine the potential market values of 1 MHz frequency licenses with a 15-year term. This analysis is based on the market approach for 1 MHz frequencies within the ranges of 700 MHz, 800 MHz, 2100 MHz, 2600 MHz, and 3400-3800 MHz (the "Subject of analysis"). The effective date of the analysis is 30 June 2024.

Our pricing analysis was performed in accordance with the scope of work specified in the Agreement. In line with the scope of work defined in the Agreement, our pricing analysis is performed under the market approach (Comparable Transactions Method) considering results of comparable frequency license auctions held in various countries.

The results of our work are summarized in the report (the "Report") presented with this letter. The Report was prepared for the exclusive use of the Client. The Report presents a summary of information, views, analyses and methodology that were used during the pricing analysis.

We appreciate the opportunity to provide you with professional services. If you have any questions or require additional information, please contact us at +995 32 215 88 11.

Sincerely

EY LLC



2. Executive summary

According to the agreed scope of work, we have performed pricing analysis of potential market values of 1MHz frequencies in the range 700 MHz, 800 MHz, 2100 MHz, 2600 MHz and 3400-3800 MHz.

During analysis we considered auctions for comparable frequencies and further adjusted on differences in:

- ▶ License duration
- ▶ Country population
- ▶ Country GDP per capita.

Auction prices for older periods were also adjusted on CPI inflation of respective country. To derive final values, we have shortlisted most relevant countries and auctions, excluded outlier data and calculated multiples after applying all necessary adjustments.

Below table summarizes potential market value results for 1 MHz:

Table 1: Market value of 1 MHz frequencies in the range of 700 MHz, 800 MHz, 2100 MHz, 2600 MHz and 3400-3800 MHz				
Frequency band	Amount of spectrum	License duration	Potential Market Value	Currency / Denominator
700 MHz	1 MHz	15 years	2,062,560	GEL
800 MHz	1 MHz	15 years	2,373,585	GEL
2100 MHz	1 MHz	15 years	1,420,673	GEL
2600 MHz	1 MHz	15 years	183,429	GEL
3400-3800 MHz	1 MHz	15 years	278,133	GEL

Source: EY analysis

For more details regarding the methodology applied, criteria for selection of the comparable auctions and details regarding the summary of selected auctions and resulting multiples for each frequency band, please refer to the next sections of the report.

3. Description of methodology, selection criteria and required adjustments

3.1 Market approach

Market Approach (International Valuation Standards (IVS) 105 Valuation Approaches and Methods): The market approach provides an indication of value by comparing the subject asset with identical or comparable (i.e., similar) assets for which price information is available. The principal methods under the market approach are:

- ▶ **Comparable Transactions Method:** Valuation is based on prices paid in actual transactions involving identical or similar assets.
- ▶ **Guideline Publicly Traded Company Method:** Valuation is based on the trading values of public companies that are similar to the subject asset.

In our analysis we have focused on application of the Comparable Transactions Method by benchmarking comparable frequency band auctions concluded on European markets within the 700, 800, 2100, 2600, and 3400-3800 MHz ranges.

The IVS emphasizes the importance of considering the relevance and comparability of the market data, the level of market activity, and the necessity of making appropriate adjustments to ensure that the comparables are indeed similar to the Subject of analysis.

During our analysis we have considered all observable and relevant adjustments by comparing shortlisted comparable auction countries to Georgia. All relevant adjustments conducted during our analysis are described further.

3.2 Description of selection criteria

Following selection criteria were applied to shortlist identified frequency band license auctions:

- ▶ **European market:** European markets were the main focus.
- ▶ **Regulatory framework:** Most of the shortlisted countries are following the same radio frequency regulation (i.e., members of ITU's Region 1, members of CEPT and member of European Union following the framework of European Union telecommunications directives), which is more applicable to Georgia.
- ▶ **License duration:** We focused on nationwide license auctions with duration between 10 to 40 years but further adjusted for differences in duration (15 years considered by ComCom).

3.3 Required adjustments

Once relevant comparable auctions were shortlisted, as the next step adjustments for relevant differences between selected countries and Georgia were applied. During our analysis we have considered following adjustments:

- ▶ **License duration:** We have identified license auctions with different license durations. We have applied adjustments on duration considering 15 years of Subject frequency band license duration.
- ▶ **CPI Inflation:** Past auctions prices were indexed on CPI inflation.
- ▶ **Population coverage:** Adjustment for difference in population coverage was considered. Taking into account a large difference between Georgian population and population of other selected countries, we have analyzed a threshold based on the median population (10.5 million median threshold was applied) and excluded countries that exceeded respective threshold.
- ▶ **Country GDP per capita:** we have considered differences in GDP per capita between Georgia and respective countries.

4. Summary of results for each Subject of analysis

4.1 700 MHz Band

During the analysis of 700 MHz band auctions, we have selected 80 transactions across 20 European countries, specifically targeting the 700 MHz band and FDD type (SDL auctions have not been taken into account).

- ▶ Results of frequency spectrum auctions were examined separately for each comparable transaction and outlier comparables were excluded from the final list for the multiple calculation.
- ▶ Collected data revealed high outliers which led to removal of all countries with population above median value of 10.5 million threshold.

Below table summarizes the derived average multiples for each selected country, detailing the time period of the shortlisted auctions and the adjusted average multiples.

Table 2: Summary of shortlisted countries and derived average multiples

Country	Transaction date	Band category	Type	USD/Mhz/GDP per capita Multiple Adjusted for license duration
Lithuania	Aug-2022	700MHz FDD	FDD	27.522
Latvia	Dec-2021	700MHz FDD	FDD	6.748
Croatia	Dec-2021	700MHz FDD	FDD	143.731
Portugal	Oct-2021	700MHz FDD	FDD	66.035
Slovenia	Apr-2021	700MHz FDD	FDD	21.049
Greece	Dec-2020	700MHz FDD	FDD	281.525
Slovakia	Nov-2020	700MHz FDD	FDD	71.355
Hungary	Mar-2020	700MHz FDD	FDD	236.603
Norway	Jun-2019	700MHz FDD	FDD	10.802
Finland	Nov-2016	700MHz FDD	FDD	27.681
Average				89.305

Source: EY analysis, Mason Analytics

The derived average multiples were used to calculate the estimated price of 1 MHz for the respective frequency in Georgia. These calculations took into account GDP per capita of Georgia as of 2023 and the USD/GEL exchange rate as of June 30, 2024.

Below table summarizes application of derived multiples and steps to arrive to the potential market values of 1MHz for respective frequency band for Georgia.

Table 2.1: Summary of analysis for 700 MHz band:

GEL	MHz Value
(USD/Mhz/GDP per capita Multiple Adjusted for license duration) [1]	89.305
GDP per capita of Georgia (USD) [2]	8,219
Total Mhz [3]	1
Exchange rate (current) [4]	2.81
Estimated Price, GEL [5] = [1] * [2] * [3] * [4]	2,062,560
Estimated Price per MHz	2,062,560

Source: EY analysis, Georgian National Statistics Agency, National Bank of Georgia

4.2 800 MHz Band

During the analysis of 800 MHz band auctions, we have selected 63 transactions across 16 European countries, specifically targeting the 800 MHz band and FDD type.

- ▶ Results of frequency spectrum auctions were examined separately for each comparable transaction and outlier comparables were excluded from the final list for the multiple calculation.
- ▶ Collected data revealed high outliers which led to removal of all countries with population above median value of 10.5 million threshold.

Below table summarizes the derived average multiples for each selected country, detailing the time period of the shortlisted auctions and the adjusted average multiples.

Table 3: Summary of shortlisted countries and derived average multiples

Country	Transaction date	Band category	Type	USD/Mhz/GDP per capita Multiple Adjusted for license duration
Croatia	Mar-2023	800MHz FDD	FDD	50.83
Greece	Oct-2014	800MHz FDD	FDD	281.40
Finland	Oct-2013	800MHz FDD	FDD	34.22
Lithuania	Oct-2013	800MHz FDD	FDD	8.39
Denmark	Jun-2012	800MHz FDD	FDD	18.77
Portugal	Nov-2011	800MHz FDD	FDD	223.02
Average				102.772

Source: EY analysis, Mason Analytics

The derived average multiples were used to calculate the estimated price of 1 MHz for the respective frequency in Georgia. These calculations took into account GDP per capita of Georgia as of 2023 and the USD/GEL exchange rate as of June 30, 2024.

Below table summarizes application of derived multiples and steps to arrive to the potential market values of 1MHz for respective frequency band for Georgia.

Table 3.1: Summary of analysis for 800 MHz band:

GEL	MHz Value
(USD/Mhz/GDP per capita Multiple Adjusted for license duration) [1]	102.772
GDP per capita of Georgia (USD) [2]	8,219
Total Mhz [3]	1
Exchange rate (current) [4]	2.81
Estimated Price, GEL [5] = [1] * [2] * [3] * [4]	2,373,585
Estimated Price per MHz	2,373,585

Source: EY analysis, Georgian National Statistics Agency, National Bank of Georgia

4.3 2100 MHz Band

During the analysis of 2100 MHz band auctions, we have selected 58 transactions across 17 European countries.

- ▶ Results of frequency spectrum auctions were examined separately for each comparable transaction and outlier comparables were excluded from the final list for the multiple calculation.
- ▶ Collected data revealed high outliers which led to removal of all countries with population above median value of 10.5 million threshold.

Below table summarizes the derived average multiples for each selected country, detailing the time period of the shortlisted auctions and the adjusted average multiples.

Table 4: Summary of shortlisted countries and derived average multiples

Country	Transaction date	Band category	Type	USD/Mhz/GDP per capita Multiple Adjusted for license duration
Moldova	Dec-2023	2100 MHz FDD	FDD	94.65
Croatia	Mar-2023	2100 MHz FDD	FDD	36.38
Portugal	Oct-2021	2100 MHz FDD	FDD	36.51
Slovenia	Apr-2021	2100 MHz FDD	FDD	23.96
Greece	Dec-2020	2100 MHz FDD	FDD	98.12
Hungary	Mar-2020	2100 MHz FDD	FDD	79.46
Average				61.513

Source: EY analysis, Mason Analytics

The derived average multiples were used to calculate the estimated price of 1 MHz for the respective frequency in Georgia. These calculations took into account GDP per capita of Georgia as of 2023 and the USD/GEL exchange rate as of June 30, 2024.

Below table summarizes application of derived multiples and steps to arrive to the potential market values of 1MHz for respective frequency band for Georgia.

Table 4.1: Summary of analysis for 2100 MHz band:

GEL	MHz Value
(USD/Mhz/GDP per capita Multiple Adjusted for license duration) [1]	61.513
GDP per capita of Georgia (USD) [2]	8,219
Total Mhz [3]	1
Exchange rate (current) [4]	2.81
Estimated Price, GEL [5] = [1] * [2] * [3] * [4]	1,420,673
Estimated Price per MHz	1,420,673

Source: EY analysis, Georgian National Statistics Agency, National Bank of Georgia

4.4 2600 MHz Band

During the analysis of 2600 MHz band auctions, we have selected 142 transactions across 17 European countries.

- ▶ Results of frequency spectrum auctions were examined separately for each comparable transaction and outlier comparables were excluded from the final list for the multiple calculation.
- ▶ Collected data revealed high outliers which led to removal of all countries with population above median value of 10.5 million threshold.

Below table summarizes the derived average multiples for each selected country, detailing the time period of the shortlisted auctions and the adjusted average multiples.

Table 5: Summary of shortlisted countries and derived average multiples

Country	Transaction date	Band category	Type	USD/Mhz/GDP per capita Multiple Adjusted for license duration
Croatia	Mar-2023	2600MHz FDD	FDD	3.64
Norway	Sep-2021	2600MHz FDD	FDD	4.01
Greece	Oct-2014	2600MHz FDD	FDD	25.68
Greece	Oct-2014	2600MHz TDD	TDD	8.43
Portugal	Nov-2011	2600MHz FDD	FDD	14.87
Portugal	Nov-2011	2600MHz TDD	TDD	5.95
Finland	Nov-2009	2600MHz TDD	TDD	0.61
Finland	Nov-2009	2600MHz FDD	FDD	0.35
<i>Average</i>				7.942

Source: EY analysis, Mason Analytics

The derived average multiples were used to calculate the estimated price of 1 MHz for the respective frequency in Georgia. These calculations took into account GDP per capita of Georgia as of 2023 and the USD/GEL exchange rate as of June 30, 2024.

Below table summarizes application of derived multiples and steps to arrive to the potential market values of 1MHz for respective frequency band for Georgia.

Table 5.1: Summary of analysis for 2600 MHz band:

GEL	MHz Value
<i>(USD/Mhz/GDP per capita Multiple Adjusted for license duration) [1]</i>	7.942
<i>GDP per capita of Georgia (USD) [2]</i>	8,219
<i>Total Mhz [3]</i>	1
<i>Exchange rate (current) [4]</i>	2.81
<i>Estimated Price, GEL [5] = [1] * [2] * [3] * [4]</i>	183,429
<i>Estimated Price per MHz</i>	183,429

Source: EY analysis, Georgian National Statistics Agency, National Bank of Georgia

4.5 3400-3800 MHz Band

During the analysis of 3400-3800 MHz band auctions, we have selected 149 transactions across 21 European countries, specifically targeting the 3400-3800 MHz band and TDD type.

- ▶ Results of frequency spectrum auctions were examined separately for each comparable transaction and outlier comparables were excluded from the final list for the multiple calculation.
- ▶ Collected data revealed high outliers which led to removal of all countries with population above median value of 10.5 million threshold.

Below table summarizes the derived average multiples for each selected country, detailing the time period of the shortlisted auctions and the adjusted average multiples.

Table 6: Summary of shortlisted countries and derived average multiples

Country	Transaction date	Band category	Type	USD/Mhz/GDP per capita Multiple Adjusted for license duration
Latvia	Nov-2023	3.4-3.8GHz	TDD	0.39
Lithuania	Aug-2022	3.4-3.8GHz	TDD	1.46
Slovakia	May-2022	3.4-3.8GHz	TDD	6.14
Croatia	Dec-2021	3.4-3.8GHz	TDD	33.47
Portugal	Oct-2021	3.4-3.8GHz	TDD	28.19
Norway	Sep-2021	3.4-3.8GHz	TDD	6.23
Slovenia	Apr-2021	3.4-3.8GHz	TDD	4.92
Greece	Dec-2020	3.4-3.8GHz	TDD	14.38
Hungary	Mar-2020	3.4-3.8GHz	TDD	30.42
Finland	Oct-2018	3.4-3.8GHz	TDD	4.89
Ireland	May-2017	3.4-3.8GHz	TDD	1.97
Average				12.043

Source: EY analysis, Mason Analytics

The derived average multiples were used to calculate the estimated price of 1 MHz for the respective frequency in Georgia. These calculations took into account GDP per capita of Georgia as of 2023 and the USD/GEL exchange rate as of June 30, 2024.

Below table summarizes application of derived multiples and steps to arrive to the potential market values of 1MHz for respective frequency band for Georgia.

Table 6.1: Summary of analysis for 3400-3800 MHz band:

GEL	MHz Value
(USD/Mhz/GDP per capita Multiple Adjusted for license duration) [1]	12.043
GDP per capita of Georgia (USD) [2]	8,219
Total Mhz [3]	1
Exchange rate (current) [4]	2.81
Estimated Price, GEL [5] = [1] * [2] * [3] * [4]	278,133
Estimated Price per MHz	278,133

Source: EY analysis, Georgian National Statistics Agency, National Bank of Georgia

5. Appendices

5.1 Limiting conditions

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- ▶ *All calculations were made in Microsoft Excel. The numbers were not rounded, except where specifically stated in the Report.*
- ▶ *In accordance with the terms of the Agreement, pricing analysis of potential market value of 1MHz within each specified frequency band was performed under the Market approach. We did not conduct a Discounted Cash Flow (DCF) method under the Income approach, as this method was excluded from the scope of the Agreement. It is important to note, that the outcomes of our analysis derived under the market approach may potentially differ from those that would have been obtained if both the market approach and the income approach were applied*
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5.2 Sources of information

Following sources of information were used during our analysis:

Source	Data
Mason Analytics	Historical data of auctions for comparable frequency bands
Telecom regulator websites and official data	Historical data of auctions for comparable frequency bands
Oxford economics	CPI inflation, GDP per capita
World Bank	CPI inflation, GDP per capita
National Bank of Georgia	Exchange rates, GDP per capita
Georgian National Statistics Agency	Exchange rates, GDP per capita

5.3 Abbreviations

Abbreviation	Definition
CPI	Consumer Price Index
EY	Ernst and Young
FDD	Frequency Division Duplexing
GDP	Gross Domestic Product
GEL	Georgian Lari
ComCom	Georgian National Communications Commission
IVS	International Valuation Standards
LLC	Limited Liability Company
MHz	Megahertz
No.	Number
TDD	Time Division Duplexing
USD	United States Dollar

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