

TeRaPro

Economic impact analysis of potential subscription reporting irregularities (i.e. under reporting and content piracy) of cable operators in the Bulgarian market

January 2020



Building a better
working world

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1. Introduction

Background

Ernst & Young Bulgaria EOOD (hereinafter referred to as “EY” or “we”) was engaged by The Association for Protection of the Legal Distribution of Programs - TeRaPro (hereinafter referred to as, “TeRaPro”, “you” or “Client”) to update the report “Economic impact analysis of potential subscription reporting irregularities (i.e. under reporting and content piracy) of cable operators in the Bulgarian market” which was developed and delivered by EY Bulgaria EOOD to TeRaPro in November 2016.

TeRaPro is an organization that protects the rights of producers and distributors of TV programs and audio-visual creations. TeRaPro supports a legal and transparent business model based on protection of the investments and the competition as well as introduction of innovation on the Bulgarian TV market.

The report has been drafted to summarize our findings as of October 2019.

Currency and amounts

All amounts specified in this report are denominated in Bulgarian Lev (“BGN”), unless otherwise specified. All amounts include VAT unless otherwise stated.

Scope of Work

Our scope of work, as described in our Engagement Letter dated 20 October 2019, comprises of the following elements:

- A. Discuss with client and identify and agree publicly available information sources that could provide information for the purposes of our analysis
- B. Extract relevant information from publicly available sources
- C. Analyze information and quantify the potential economic impact of subscription under reporting and content piracy on the industry in Bulgaria

- D. Provide conclusions and observations based on our analysis along with recommendations for potential future actions to be undertaken to remedy the current prevailing situation

2. Executive Summary

Highlights of market data as per EY analysis		
Description	2018	2015
Current subscribers in the mkt. reported as per CRC data	2,027,583	1,784,013
Our calculations for potential number of subscribers in the mkt.	2,332,400	2,398,877
Excess number of subscribers not reported	304,817 (+15%)	614,864 (+34%)
Gross potential impact from under reporting only (in BGN including VAT)	66,431,387	76,673,233
Gross annual potential impact range (underreporting + piracy BGN)	45 - 79 million	64 - 149 million

We were engaged by the Association for Protection of the Legal Distribution of Programs (TeRaPro) to update the report "Economic impact analysis of potential subscription reporting irregularities (i.e. under reporting and content piracy) of cable operators in the Bulgarian market" which was developed and delivered by EY Bulgaria EOOD to TeRaPro in November 2016.

In accordance with our discussions, the update to the report is based on the latest data and information published by the two key regulatory bodies - CEM and CRC. For the purpose of this update, we used open source information (e.g. cable operator websites). In addition to open sources, TeRaPro also provided us with information which is incorporated in the report.

For the purpose of our engagement, we have selected a sample of 47 cable distributors. These cable distributors have been selected based on (1) subscriber numbers and (2) random sampling approach.

Based on the 2018 CRC data published, the 47 cable operators selected represent over 96% of the subscriber market in Bulgaria. We have reviewed their websites where possible and we have extracted information related to TV channels, packages and services on offer along with the prices for each.

For 13 of these cable operators selected, such information was not available due to various reasons: website existed but there was no information about packages and prices, website was under construction, or website did not exist).

Considering the variety of packages and prices on offer, we have then used the weightage of these operators based on their share of the market to create three simplified packages of TV and bundled services (Basic; Standard; Advanced) and we have calculated the pricing of these packages. A comparison of our pricing with market indicates that our calculation is reasonable.

We have also used the Eurobarometer report and the Eurostat data to arrive at a calculation of households with access to paid TV.

Once all the information had been extracted as required, we applied statistical and mathematical methods in order to quantify the value of under reporting and content piracy in the Bulgarian market.

As part of our work, we have observed statistical variances between the CRC data and the Eurobarometer report.

Based on the 2018 CRC Report:

- Satellite TV subscriptions account for: 48% of the total subscriptions' revenue on the Bulgarian market with a share in the total subscription numbers of 51% (meaning that the average revenue of satellite services per subscription is slightly lower than the average for the market)
- Cable TV represents: 28% of all subscription numbers and in terms of revenue share, it accounts for 28% of the market.

Based on the above and if we take into account the purchasing power parity and the price sensitivity of the market. Then logically speaking:

- If Cable TV is cheaper than the other modes of content distribution, then in a price sensitive market like Bulgaria, the market penetration of cable TV should be much higher than the numbers being reported to the CRC. This means that there is a discrepancy between CRC data for Cable TV 2018 which is (28%) compared to Eurobarometer (53%). It is evident that, logically, the Eurobarometer data seems more sound.

- In reverse. The more expensive satellite services should have a smaller penetration and market share. Currently, CRC shows this share to be 48% whereas the Eurobarometer survey shows a more logically lower percentage of market share for Satellite services considering their higher prices (30%).
- These discrepancies observed above for a price sensitive market and the significant variances between the data from the two sources (CRC vs. Eurobarometer), which should normally be identical with minor differences, further underlining the case for an empirical study of the market.

The results of our analysis indicate that the subscription numbers and hence the total size of the retail subscriptions market in Bulgaria, as shown on the published information of CRC and CEM may potentially be inaccurate and not reflective of the actual size of the market.

As a natural progression of this logic and following on from our report in 2016, we continue to assume that potentially, the size of the market is still under reported either due to under reporting on actual subscription numbers or as a result of content piracy.

Based on our work we have concluded that there might be two types of potential misreporting:

- Under reporting of the actual number of subscribers;
- Content piracy which would involve cable operators providing content and channels to subscribers and households for which they have no valid contractual rights given to them by the content owners.

A high-level view of the comparison between our current results and the results as per the 2016 Report can be seen in the table at the beginning of the executive summary.

Taking household data and paid television market penetration percentages, we have estimated that the potential number of subscribers of paid television in Bulgaria is approximately **2,332,400 subscribers/households** as of 31 December 2018 compared to approximately **2,398,877 subscribers/households** as of 31 December 2015 (this decrease is mainly because of a decrease in total household numbers in Bulgaria as per the Eurostat data 2018 v 2015).

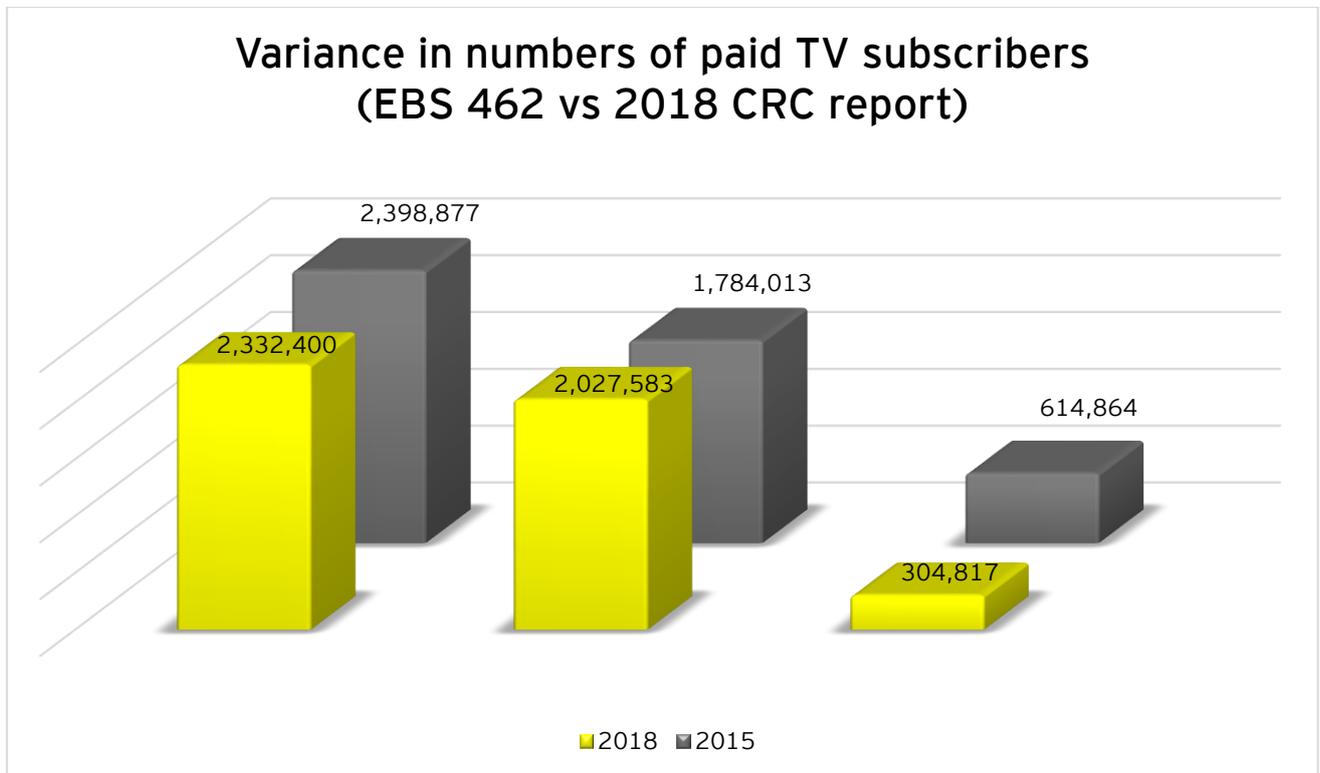
This means that the potential number of subscribers (available in the market) as we have calculated exceeds the number of subscribers currently being reported to the CRC.

This means that the size of the market (subscriber numbers) could be **potentially 304,817 subscribers more (approx.15% more) as compared to the current reported 2018 data** in the electronic register of CRC.

This is a big change compared to the results in our 2016 Report, where the size of the market (subscriber numbers) was estimated to be **potentially 614,864 subscribers more (or 34% more) as compared to the CRC 2015 data.**

This decrease (2018 v 2015) in potentially inaccurate subscriber numbers is mainly driven by:

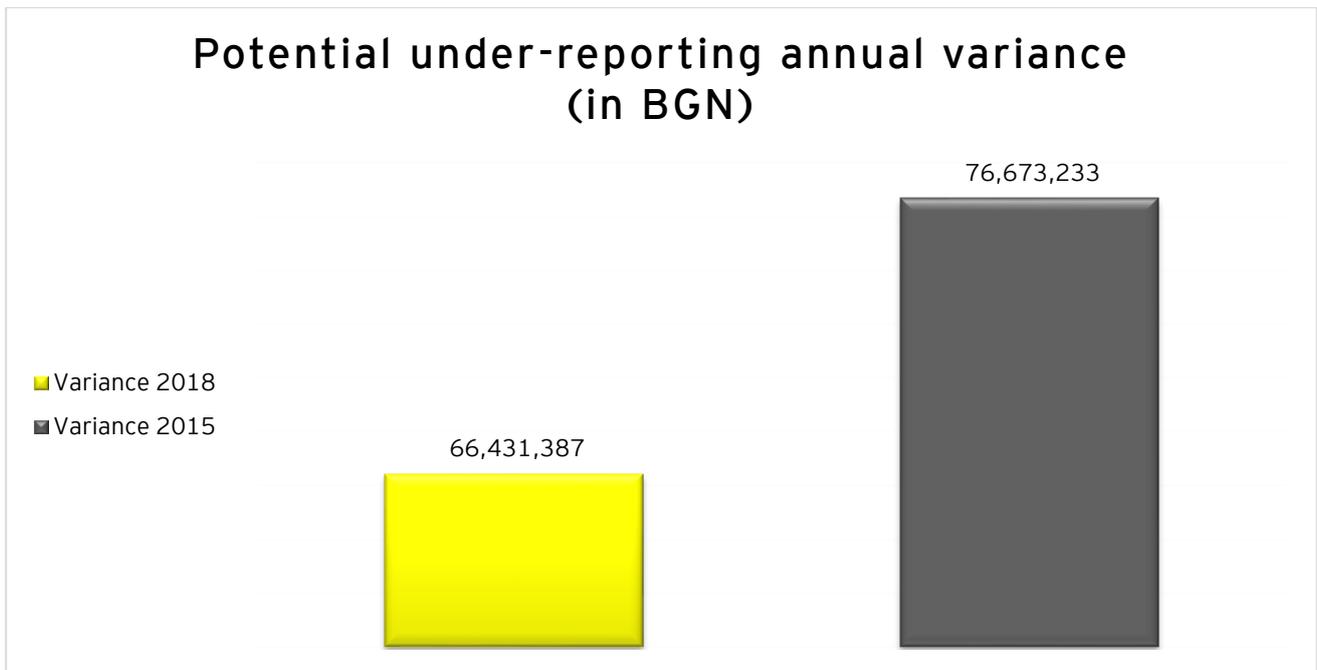
- The fact that there is now an increase in the number of paid TV subscribers in Bulgaria as per 2018 CRC data (2,027,583)
- And, there is a decrease in the number of households in Bulgaria with access to TV different from Digital Terrestrial TV (also number of subscribers of paid TV) in 2018 (2,332,400) as illustrated in the chart below.



This variance from potential under reporting alone results annually in a **lost potential revenue of BGN 66,431,387 (inclusive VAT)** that is not being reported to the content providing industry as a whole. (According to the 2016 Report, the under-reporting variance amounted to an annual potential BGN 76,673,233 VAT inclusive).

In line with the above, potentially lost and under reported revenue is also not being reported to any of the state institutions such as the National Revenue Agency (NRA), CEM or CRC, thus also having a significant impact on state revenue.

However, we do not have access to the financial books and records of the cable operators, as such, we are unable to comment on their actual submissions to such agencies.



In addition to underreporting, we have also analysed the “add-on effect” of losses caused by content piracy.

We calculated the estimated market size for paid TV services by arriving at average package prices for TV services as a stand-alone service (BGN 19.57) and as part of a bundled service offering (BGN 16.63).

The CRC report already gives us a percentage split of how many subscribers use stand-alone TV (68%) and how many use bundled services (32%) in the market.

We applied this percentage split to the number of potential subscribers as we have calculated above. And then used these two subscriber numbers and the average package prices as shown to arrive at a potentially expected Bulgarian market revenue size of **BGN 521,190,808**.

This market size revenue estimation was compared to the market revenue declared and published in the CRC report for 2018 (BGN 441,888,000 inclusive VAT).

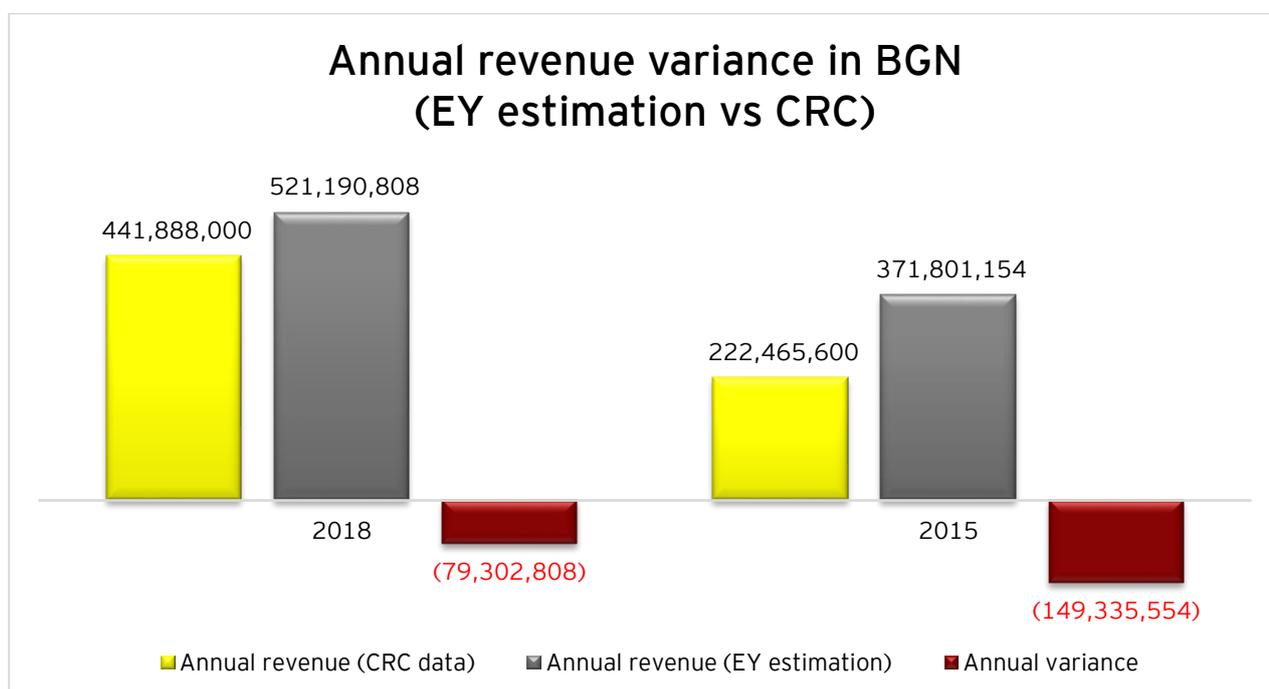
Based on the calculations above, the difference between our market revenue estimation and the CRC 2018 reported revenue represents total **annual potential loss of BGN 79,302,808 (inclusive VAT)** to the industry being caused by the combined effect of the two elements of misreporting (underreporting and piracy).

We compared the estimated annual potential loss for 2018 to the results in our 2016 Report in the chart below. Based on our analysis for 2018, we observe a significant decrease in the annual potential loss of

approximately BGN 70 million compared to the results for 2015. The decrease in the annual potential loss is mainly driven by:

- (i) Increase in the annual revenue of 50% in 2018 compared to the annual revenue in 2015 as per CRC data;
- (ii) Decrease of 30% in the number of TV subscribers that have access to paid TV as part of a service bundle (internet, mobile/fixed telephony, etc.) as per CRC data for 2018 compared to the CRC data for 2015;
- (iii) Increase of 14% in the number of subscribers that have access to TV as a standalone service as per CRC data for 2018 compared to the CRC data for 2015;
- (iv) Increase of 21% in the average package price for stand-alone TV services (BGN 19.57 in 2018 vs BGN 15.55 in 2015) as per EY assumption and estimation;
- (v) Increase of 44% in the average package price for a bundled service offering (BGN 16.63 in 2018 vs BGN 9.33 in 2015) as per EY assumption and estimation.

In connection with the calculation above, it would be very important to mention a limitation, which is the fact that we have no information at our disposal that would allow us to determine the factual distribution of the three underlying packages (basic/standard/advanced) in the subscriber population. As such, the calculation above assumes a uniformly equal distribution for these packages i.e. 33.3% usage for each package by subscribers.



Considering the fact that this could not be true and the lack of factual information, we have also calculated the potential size and thus the potential loss based on two additionally assumed scenarios where the package distribution in the subscriber population has been assigned as follows:

- **Package distribution Scenario 1:** Basic 30% of the market / Standard 50% of the market / Advanced 20% of the market;

AND

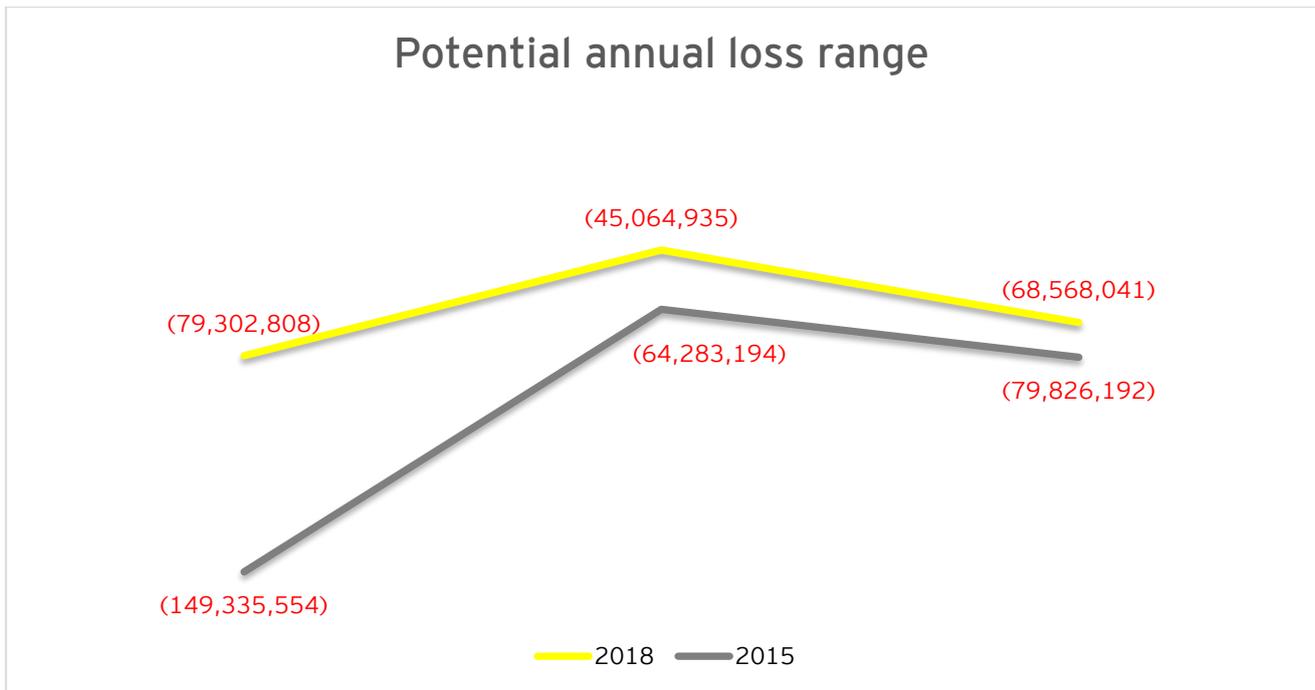
- **Package distribution Scenario 2:** Basic 35% of the market / Standard 35% of the market / Advanced 30% of the market;

Taking into account these two package distribution scenarios above, the potential market size and hence the potential loss impact for these two scenarios has been calculated compared to the 2018 CRC market revenue size as follows:

- **Scenario 1:** Potential market size BGN 486,952,935 (inclusive VAT) and potential loss impact of BGN 45,064,935 (inclusive VAT)
- **Scenario 2:** Potential market size BGN 510,456,041 (inclusive VAT) and potential loss impact of BGN 68,568,041 (inclusive VAT)

Our scenario calculations above thus give a potential range of market sizes varying from approximately BGN 487 million annually to BGN 521 million annually.

Likewise, based on this range, the potential loss impact could range from BGN 45 million annually to BGN 79 million annually. We compared our calculations for 2018 to the calculations in the 2016 Report in the chart below.



As stated above, misreported revenue or some aspects of it thereof is also being hidden from proper financial reporting, as such there is also a potential impact on the state exchequer from a tax aspect. Such an impact would adversely affect taxes like VAT (20% standard rate), tax on corporate profit (10% standard rate) and taxes related to payroll of employees (e.g. income tax, social security contributions etc.).

If our calculation on misreported profit above is taken into account and analysed on the basis of the currently prevalent tax rates in the currently, such an adverse tax impact could potentially be in millions of leva each year.

This number could be calculated with more accuracy if we are provided access to the books and records of cable operators. This further underlines our recommendations regarding the need of a nationwide survey and the need for conducting regular cable operator audits to consistently improve the quality of reliable information available and to get a more accurate picture of the market.

Inaccuracies in market data available and potential ongoing revenue losses could have far reaching implications both for the industry and the economy. Some of the key implications are listed below:

- i. Non-availability of factual or widely accepted and reliable data might have adverse implications for investor trust and new investment. It could also lead to investor exits as has been seen in the transaction for some of the big TV channels in the Bulgarian market in 2018-19.

- ii. Potentially inaccurate, unreliable and non-transparent data reported to the regulatory bodies (CEM and CRC) adversely impacts their monitoring, decision making and policy creating abilities.
- iii. Limited or terminated operations of existing investors would lead to reduced availability of capital inflows into the industry.

Following on from the above, it is important to mention that this report should not be treated as a standalone document. It has a wider context and its long-term purpose is to emphasise the need for much needed further actions that address the issues and constraints facing the industry and as highlighted in this report.

In this spirit, we have also given recommendations for future considerations and actions that should be discussed within the industry and with the regulators before agreeing on acceptable remedial steps in the future (see Article 6 *Recommendations and roadmap*).

3. Description of information sources

For the purpose of our analysis we have agreed with the Client to use the following publicly available sources of information:

Data from the Communications Regulation Commission (CRC)¹

From the electronic registers on the website of CRC we have extracted information related to:

1. Total number of subscriptions in 2018 - this allows us to calculate the total size of the Bulgarian market for subscribers
2. Information about the websites of the various cable TV operators (Note: In addition to the information on the website of CRC, we also had to search in some cases for the accurate legal names of some of the cable operator in order to verify/confirm the website relevant to our needs)

Data from the Council for Electronic Media (CEM)²

From the electronic register on the website of CEM we have obtained information for the TV providers in our sample.

Special Eurobarometer Report No 462: E-communications and Digital Single Market Household Survey³

The report contains data on the household access to television in the EU as well as the distribution of the various types of access between digital terrestrial television, satellite TV, cable TV, etc. (including information for each of the EU member states). This report contains data for the year 2017 and is the latest available study which contains data for the number of households that have access to television in Bulgaria (99%).

¹ Communications Regulation Commission translates into Bulgarian as Комисия за регулиране на съобщенията (<http://www.crc.bg/>)

² Council for Electronic Media translates into Bulgarian as СЪВЕТ ЗА ЕЛЕКТРОННИ МЕДИИ (<http://www.cem.bg/>)

³ http://data.europa.eu/euodp/en/data/dataset/S2155_87_2_462_ENG

Data from Eurostat relating to the number of households in Bulgaria⁴

The source contains data regarding the total number of households in Bulgaria in 2018.

Data from the BMedia Industrial Study

The study contains information for the TV market in Bulgaria including information for penetration of paid TV, penetration per TV signal type, number of TV subscribers, etc. The data was provided to us by TeRaPro.

Data from the 2019 Special 301 Report of the Office of the United States Trade Representative⁵

The report contains a dedicated section about Bulgaria. For the analysis and interpretation of the data we used the opinion and recommendations included in that report.

⁴ http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_hhnhtych&lang=en

⁵ The "Special 301" Report is an annual review of the global state of intellectual property rights (IPR) protection and enforcement. This report reflects the Administration's resolve to encourage and maintain effective IPR protection and enforcement worldwide. <https://ustr.gov/about-us/policy-offices/press-office/reports-and-publications/>

4. Description of methodology

In order to quantify the potential subscription under reporting and content piracy, EY has created a customised approach and methodology to extract and use the data from the publicly available information sources for the purpose of this analysis.

As described above, we have conducted a detailed analysis of the various available information sources in order to identify any data relevant to our analysis.

This methodology consists of the following phases:

Phase 1: Collecting data and database preparation - calculation of the potential number of subscribers of paid television in Bulgaria

From the different publicly available information sources we have extracted a wide variety of data heads and types in order to build an analysis model for the purpose of our work.

The first key element of our analysis is to estimate the potential actual size of the Bulgarian retail market of paid television subscriptions. We used data for the year 2018 and 2017.

Based on the available information we have used a deductive approach:

First, we extracted data for the total number of households in Bulgaria in 2018. We employed **Eurostat data** (2,708,000 households) for this purpose.

As a next step we have calculated the number of households that have access to television. For this purpose, we have used the **Special Eurobarometer Report No 462 (EBS 462)** where the percentage of households with access to any type of television within Bulgaria is 99%. Using this percentage, the estimated number of households with access to television in Bulgaria is 2,680,920.

There is a study available (BMedia Industrial Study) which provides information on the percentage of households with access to any type of television particularly in Bulgaria. According to this report Bulgarian household's access to TV is calculated at 98%. In order to be compliant with the data in the 2016 Report, we decided to use the Eurostat data (99%) rather than the percentage in the BMedia Industrial Study for 2018 (the difference is negligible).

From the total number of households with access to TV in Bulgaria in 2018 (2,680,920) we calculated the number of households with paid television. For that purpose, we used the EBS 462 analysis which reports that 87% of all households with access to television pay for it.

As a result, the potential number of households in Bulgaria in 2018 which subscribe for paid TV is calculated at **2,332,400**.

Note: For the purpose of our analysis we use household as an equivalent of subscription. However, this approach excludes from the analysis any subscriptions that relate to paid television in company offices, vacation homes, hotels, hostels and guest houses, as well as subscriptions abroad (for example for satellite TV). It is important to remember that **this too is a source of lost revenue** e.g. one subscription for a hotel in Sunny Beach catering to 100 rooms.

Since it would be speculative to estimate this number we decided not to use any assumptions in this respect and stick to the more conservative number of 2,332,400 households/subscribers of paid television.

At this point we are able to compare the subscriptions number from our calculations (2,332,400) with the subscription numbers from the **2018 official CRC report (2,027,583)**.

The variance between the two numbers (EY analysis vs 2018 CRC Report) calculated in this way is 304,817. This number represents the potential figure of misreporting of the number of subscribers based on our analysis.

In other words, existing data in the market potentially suggest that on the Bulgarian market **15%** of the retail subscribers in 2018 may have not been reported by the content distributors to the copyright owners/holders.

As has been seen above, the Eurobarometer report shows that from the households with TV access in Bulgaria, 87% of such households pay for such services (in the EBS 462 report). However, paid TV has different modes of distribution in Bulgaria. Moreover, the potential inaccuracy in subscriber numbers seen thus far cannot be allocated equally to all modes prevalent in the market.

As such, we have additionally made a very high-level analysis of the market segmentation based on the underlying technology of the mode of disbursement of content i.e. Cable TV / Satellite TV / IPTV as provided in the Eurobarometer report to the same categories in the 2018 CRC report. The comparison can be seen in the table below:

COMPARISON OF MARKET SHARE IN BULGARIA BASED ON MODES OF DISTRIBUTION

Technology for distribution of television	Percentage of subscriptions from the total paid subscriptions depending on the signal delivery technology (EBS 462)	Percentage of subscriptions from the total paid subscriptions depending on the signal delivery technology (2018 CRC report)	Difference (EBS 462 vs 2018 CRC Report)
Cable TV	53%	28%	25%
Satellite TV	30%	51%	-21%
IPTV	3%	22%	-19%

Based on the 2018 CRC Report the satellite TV subscriptions account for 48% of the total subscriptions' revenue on the Bulgarian market with a share in the total subscription numbers of 51%, which suggests the average revenue of satellite services per subscription is slightly lower than the average for the market (based on all technologies).

On the other hand, cable TV represents 28% of all subscription numbers and in terms of revenue share, it accounts for 28% of the market.

Based on the above:

- If Cable TV is cheaper than the other modes of content distribution, then in a price sensitive market like Bulgaria, the market penetration of cable TV should be much higher than the numbers being reported to the CRC. This means that there is a discrepancy between CRC data for Cable TV 2018 which is (28%) compared to Eurobarometer (53%). It is evident that, logically, the Eurobarometer data seems more sound.
- In reverse. The more expensive satellite services should have a smaller penetration and market share. Currently, CRC shows this share to be 48% whereas the Eurobarometer survey shows a more logically lower percentage of market share for Satellite services considering their higher prices (30%).
- These discrepancies observed above for a price sensitive market and the significant variances between the data from the two sources (CRC vs. Eurobarometer), which should normally be identical with minor differences, further underlining the case for an empirical study of the market.

Phase 2: Quantification of potential misreporting

We will now use the numbers calculated in Phase 1 and proceed to calculating the potential financial loss for the content owners/holders **due to under reporting of the actual subscriptions' numbers**.

For this purpose, we have calculated the average monthly subscription fee based entirely on the 2018 CRC data:

Annual revenue in BGN excluding VAT as per CRC 2018 data [A]	Annual revenue in BGN including 20% VAT as per CRC 2018 data [B=A*1.2]	Monthly revenue in BGN including VAT as per CRC 2018 data [C=B/12]	Number of subscribers as per CRC 2018 data [D]	Average monthly subscription fee in BGN (CRC data, VAT included) [E=C/D]
368,240,000	441,888,000	36,824,000	2,027,583	18.16

As a result, the average monthly subscription fee including VAT is BGN 18.16.

We then calculated and compared the total annual size of the Bulgarian market in financial terms based on household/subscription numbers from the CRC data and the EY analysis:

- 2018 CRC data (2,027,583 number of subscribers multiplied by the average monthly subscription fee of BGN 18.16 including VAT)
- EY extrapolation (2,332,400 number of subscribers multiplied by the average monthly subscription fee of BGN 18.16 including VAT)

Based on the above, we arrive at the following comparison:

	Based on 2018 CRC data (2,027,583 subscribers) [A=No. of subscribers* Arvg monthly subscription fee*12 months]	Based on 2018 EY analysis (2,332,400 subscribers) [B=No. of subscribers* Arvg monthly subscription fee*12 months]	Variance on annual basis (in BGN including VAT) C=B-A
Annual size of the Bulgarian market in BGN (including VAT)	441,888,000	508,319,387	66,431,387

In light of the reviewed reports and databases, as can be seen in the table above, the difference in the number of reported subscribers/households (CRC data vs. EY analysis) leads to a difference amounting to BGN 66,431,387 (including VAT) that is potentially not being reported by the cable operators for the year 2018.

Phase 3: Quantify the monetary value of potential content piracy

The next step in our analysis is designed to look at the inclusion of potential content piracy into our model in order to arrive at a logical quantification of the value of the misreporting caused by potential content piracy and its financial impact on the losses for the industry.

For the purpose of our analysis content piracy means the effect in real terms of the monetary value of providing subscribers with content that the distributor has no right over and has not agreed in any form its distribution with the content owners.

Content piracy broadly takes the following forms:

- The content distributor pays to the content owner a reduced amount that does not reflect the actual TV channels that the subscribers have access to.
- The content distributor broadcasts channels and content to which he has no rights to do so in the first place.

Since it is difficult to objectively quantify the forms of content piracy as discussed above, we have adopted an approach where the effect of content piracy and its impact on the market is calculated on an overall basis.

For this purpose, we extracted specific information for 47 content distributors from the market who were selected as follows.

A total of 47 content distributors were selected based on subscriber numbers and random sampling approach. The 47 distributors selected, represent a coverage of 96.38% of the entire population of subscribers on the Bulgarian market (as reported in the 2018 CRC report).

We then calculated the average weight of each distributor in the whole population based on the formula below:

$$\text{Average weight of a distributor in the whole population}(\%) = \frac{\text{Number of TV subscribers per distributor}}{\text{Total number of TV subscribers in Bulgaria}}$$

We reviewed the websites of all the 47 distributors selected in order to extract the information relevant to program bundles and prices per bundle. (Note: Out of the 47 selected, for 13 distributors we could not find sufficient information; Out of the 13, for 9 of them, data was not available on their websites referring to program bundles and prices per bundle; and for 4 there was no website at all).

In addition to the above and for the purpose of our analysis we have limited the program bundles to 3. Although some of the distributors are offering more than 3 bundles (up to 5 or 6 depending on options like HD channels or movie channels). However, in our opinion, using more than 3 bundles in our model would create unnecessary deviations and outliers that may complicate the model without adding any significant value either to the analysis or our results.

We also took into consideration also the fact that different content distributors have different subscriber numbers.

As a result, for our analysis we have created one final master data set of three bundles that are valid for the entire population of subscribers.

Additionally, we have taken into consideration also the fact that for certain number of subscribers the paid television comes as part of a product package with internet, mobile or fixed telephony, etc.

For that purpose, we calculated based on the 2018 CRC report that 32% of all subscribers receive access to TV as part of a service bundle together with internet or telephony and 68% as a standalone service as shown below:

Total market based on 2018 CRC data (Number of subscribers) [A]	Number of TV subscribers that have access to paid TV as part of a service bundle (internet, mobile/fixed telephony, etc.) Table 11 on page 42 in the 2018 CRC report [B]	Number of subscribers that have access to TV as a standalone service [C=A-B]
100%	32%	68%
<i>Source: Data from the 2018 CRC report</i>		

For the 32% of subscribers that receive access to paid TV as part of a service bundle (from above) we have applied an additional 15% cost reduction to the cost of the three master bundles. The reason for this is that when television is part of a wider bundle of services its absolute cost decreases. This reduction percentage is based on EY assumptions. This reduction of costs for TV services is a commercial decision based on the individual competitive market strategy of different content distributors in order to reduce the overall package price and hence incentivise customers to purchase more services.

In view of the above, concrete data to understand the logic and check such reduction calculations has not been provided to us. However, as stated above, a comparison of market packages (TV only and bundled offerings) indicates that this percentage appears to be reasonable.

Finally, the table below describes unit values of the three master bundles on the Bulgarian market (TV as a stand-alone subscription and as part of a service package with internet, telephony, etc.):

TV package	Pricing of stand- alone TV package in BGN (TV package is not part of a service bundle - together with internet, telephony, etc.) inclusive VAT [A]	Pricing of TV package in BGN as part of a service bundle (together with internet, telephony, etc.) inclusive VAT [B=A*0.7 (based on EY assumption for a 15% cost reduction)]
Basic	13.90	11.82
Standard	17.17	14.59
Advanced	27.63	23.48
Average price of TV packages	19.57	16.63

We have also calculated an average monthly subscription fee for each of the two categories (television as a standalone service and bundled together with other services). This information is required in the next step of our analysis.

We have calculated the total market size of monthly/annual subscription fees based on the average subscription fees and the subscriber number estimated by EY.

As a result, we have arrived at a figure of **BGN 494,735,308** of potential revenue that reflects both under reporting of subscription numbers and content piracy (please see table on the following page).

EY calculation of the total annual paid TV subscriptions market size inclusive VAT	
EY estimation of the actual number of subscribers (2,332,400) [A]	2,332,400
Average monthly subscription fee based on EY calculation (as standalone service) in BGN [B]	19.57
Average monthly subscription fee based on EY calculation (as part of a combined services bundle) in BGN [C]	16.63
Number of TV subscribers that have access to paid TV as part of a service bundle (internet, mobile/fixed telephony, etc.) 32 % based on EY calculation from data in the 2018 CRC report [D=A*42%]	751,152
Number of subscribers that have access to TV as a standalone service (68 % based on EY calculation from data in the 2018 CRC report) [E=A*58%]	1,581,249
Monthly market size inclusive VAT based on EY calculation of subscription numbers and average monthly subscription fees (split is based on the 2018 proportion of subscribers using television as a standalone service or part of a bundle) in BGN [F=(B*E) + (C*D)]	43,432,567
Potential annual market size (VAT inclusive) in BGN [G=F*12 months]	521,190,808

As a result of the calculations, we arrive at an annual value of misreported revenue caused by subscriber under reporting amounting to BGN 79,302,808.

For details of the variance please see the table below:

CRC 2018 data for the annual revenue in BGN including 20% VAT [A]	Annual market size inclusive VAT based on EY calculation of subscription numbers and weighted average monthly subscription fees (split is based on the 2018 proportion between television as a standalone service or part of a bundle) [B]	Annual variance in BGN inclusive VAT (EY estimation vs 2018 CRC report) [C=A-B]
441,888,000	521,190,808	79,302,808

Considering the diversity of packages available in the market, we have used the data we have collected to create three theoretical packages (basic/standard/advanced) and we have assumed a uniformly equal distribution for these packages i.e. 33.3% usage for each package by subscribers.

Considering the fact that this is a theoretical model and the actual packages in the market and their relevant subscribers would vary, we have also calculated the potential size and thus the potential loss based on two additional scenarios where the package distribution in the subscriber population has been assigned as follows:

- **Package distribution Scenario 1:** Basic 30% of the market / Standard 50% of the market / Advanced 20% of the market;

AND

- **Package distribution Scenario 2:** Basic 35% of the market / Standard 35% of the market / Advanced 30% of the market;

Taking into account these two package distribution scenarios above, the potential market size and hence the potential loss impact for these two scenarios has been calculated compared to the 2018 CRC market revenue size as follows:

- **Scenario 1:** Potential market size BGN 486,952,935 and potential loss impact of BGN 45,064,935
- **Scenario 2:** Potential market size BGN 510,456,041 and potential loss impact of BGN 68,568,041

Our scenario calculations above thus give a potential range of market sizes varying from approximately BGN 487 million annually to BGN 521 million annually.

Likewise, based on this range, the potential loss impact could range from BGN 45 million annually to BGN 79 million annually.

Phase 4: Variance Analysis and findings

As already mentioned, there are certain constraints related to the publicly available information that EY had to deal with. The major constraints that should be mentioned are:

Timing issues: The data from CEM and CRC is reflective of different periods of time (end of 2018 in CRC vs. data within the first half of 2019 in CEM varying widely from distributor to distributor).

Lack of unified cost per unit: Cable operators offer differing prices for different packages and combinations of channels. Therefore, once information has been collected on the cable operators, a unified model will have to be created for the per unit price of packages on offer.

Lack of information on the distribution of subscribers between different subscription plans: Different content distributors have different subscription plans varying for example from 2 to 5 or even 6 plans. Additionally, very often the TV subscription is bundled together with internet or telephony. There is no publicly information addressing this particular limitation.

The Phantom effect: Some of the information reported both in CEM and CRC does not match. This would either be caused by existence of cable operators for which there is either no data in CEM, or in CRC. It may also be caused by usage of different names for the legal entity and the commercial entity of the same cable operator.

These constraints and variances between different periods, sources and operators should somehow be normalised for the purpose of our analysis. For this purpose, at certain points, logical assumptions have been made.

Whenever we have used any assumptions, we have clearly stated the nature and the need of that assumption. We have also explained the basis on which such assumption has been made.

In order to further expand our analysis, we have carried out one additional comparison - for the 47 content distributors in our sample we compared the numbers of the TV channels they are broadcasting as reported by them in CEM and as reported on their own websites to identify any variances and conflicting information.

There were some limitations in this additional comparison as well:

In 19 cases out of 47 there was no data on the company website for the number of TV channels that are included in the subscription plans. In all these cases we assume that all channels are correctly reported.

In 2 cases there was no data on the CEM website for the number of TV channels that are included in the contracts with the distributors. However, information for the number of TV channels that are included in the subscription plans was available on the websites of the two distributors.

Additionally, in 15 cases the exact number of TV channels provided by the content distributor is not specified. Instead, an explanation that “over 120 channels” or “120+ channels” is used. In all these cases we used this number as the minimum.

It should also be noted that in 11 cases the content distributor has reported in CEM more TV channels than the number on the corporate website.

Based on our research in the publicly available information sources described above, we have concluded that an approximate number of 731⁶ TV channels are not reported in CEM by the 47 content distributors in our sample. The fact that these channels are not reported could be interpreted as missing broadcasting contract between the copyright owner/holder and the content provider.

Since the number of TV channels reported in CEM by the same 47 content distributors is 5,266⁷ we can calculate that not less than **14% of the channels broadcasted by content distributors are not reported in CEM** by August 2019. This percentage does not include the content distributors for which we were not able to find sufficient information in internet (the above mentioned 19 cases out of 47).

Although there is a small timing difference between the time when the 5,266 channels were reported to CEM (August 2019) and the time when we reviewed the company websites (September/October 2019) the difference in the number of television channels is significant.

Additionally, the content distributors are obliged to report any newly signed contracts for distribution of TV channels to CEM within 30 days after the contract signing (Law on Radio and Television, Article 125к, paragraph 2.1 and Article 125л, paragraph 2). Therefore, the conclusion is that the data reported to CEM is potentially inaccurate due to various reasons (e.g. incorrect data on the company websites, data not reported on time by the content distributors to CEM, etc.)

⁶ This number represents the total difference which we arrived to after taking into consideration the identified difference per TV provider. We identified the difference per TV provider as follows: if the number of channels stated on the website of the provider was less or equal to the number as per CEM register, it has been considered that there is no difference. In the cases where the number on the website of the provider was greater than the number per CEM register, we calculated the difference by subtracting the CEM data from the data published on the TV provider's website.

⁷ This number represents the sum of contracts for each of the individual providers as per the official website of CEM.

The purpose of the comparison above was to try to validate the reliability of the data available in CEM to the extent possible. We have been unable to do that. As such it can only be used as an indicator.

It was not within the scope of our work to investigate or explain what the cause of all the above variances, however the analysis demonstrates that the data in the different information sources is not matching and more robust verification measures are required.

5. Economic impact of under reporting and content piracy

The update of our analysis provides a potential quantification of the financial impact as might be caused by the potential misreporting in the Bulgarian market (made up of the dual effect of subscriber under reporting and content piracy). This updated estimated impact as shown previously might potentially range from approximately BGN 45 million annually to BGN 79 million annually inclusive of VAT.

Such potential revenue losses could have far reaching implications both for the industry and for the economy.

Some of the key implications to consider are listed below:

- Non-availability of factual or widely accepted and reliable data might have adverse implications for investor trust and new investment.
- Limited or terminated operations of existing investors would lead to reduced availability of capital inflows into the industry.
- Capital constraints due to potential reduced inflows and continued leakage of revenues (through under reporting and piracy) lead to an inability on the part of the industry to invest in new and better productions and providing television audience with better content.
- Quality of the content plays an important role on competitiveness in international markets for content export (e.g. neighbouring Turkey earns substantial revenue by exporting media content to other countries), this can only be achieved by enforcing the industry wide transparency.
- Capital constraints also create difficulties in investing in new equipment, growing, training existing staff and hiring new staff which further contribute to reduce efficiency and competitiveness in the market.
- The potential cycle of lost revenue/profit could lead to cost-cutting actions taken by copyright holders/owners including making redundancies which have their own impact on the domestic economy and job market.
- All above aspects would lead the copyright owners/holders to a condition of stagnation, which could either freeze or reverse their development resulting in crisis in the whole media and entertainment industry.
- Potentially inaccurate, unreliable and non-transparent data reported to the regulatory bodies (CEM and CRC) adversely impacts their monitoring, decision making and policy creating abilities.

As a part of considering the potential loss impact caused by misreporting, an additional element to consider would be the potential adverse impact on tax collection by the state. Such potential losses of taxation could stem from VAT, tax on corporate profit, tax on royalties on intellectual property and payroll related taxes to state a few.

Promoting integrity and industry wide cooperation on transparency and reporting and monitoring issues is in the wider interests of all stakeholders in the media industry specially and for the national economy as a whole.

6. Recommendations and roadmap

The updated analysis of the market and the potential subscription reporting irregularities of cable operators in the Bulgarian market shows a trend towards increased legalization and better transparency in the market as compared to the 2016 Report. This means that more subscribers have been brought into the reporting net and hence, revenues declared in the market and reported to CRC have increased significantly.

In the 2016 report, piracy was a key issue. However, according to the data in 2018 which we have analysed, this issue has significantly declined in its impact.

Despite these trends and decrease in deviations, our updated results and analysis still confirm that inconsistencies and variances continue to prevail in the official data that is being reported to CEM, CRC and as is publicly available on the websites of various cable operators.

In the 2016 report, our key recommendation was for immediate consideration of these issues and joint action, both on the part of the regulators, the content providers and other key stakeholders in the industry.

It appears that the first step towards legalization and improved transparency in the market have been made as can be seen based on the recent amendments in the local legislation and actions in this direction as follows:

- In June 2019, the Law on electronic communications was amended to allow CRC to bring more transparency, more control and more reliability to the market.
- According to art. 38, para 3 in the Law on electronic communications, CRC in addition to using the data provided by the operators in their submissions, might also use other publicly available information which could be obtained from a variety of official sources. They may also use publicly available and reliable, representative and quantitative market surveys (e.g. the Eurobarometer survey).
- Usage of additional information (as pointed out above) will allow CRC to conduct a more objective and qualitative analysis in order to form a view as to whether the reported revenues by cable operators are within the tolerance range of logical deviations. This will allow CRC to estimate the potential losses being suffered by the media and entertainment industry and the state itself from under reported revenue
- However, in order to use such additional data and market surveys, CRC will have to devise a methodology and criteria which allows them to standardise and unify such data sources in order to make them comparable to the data and reports being submitted by the cable operators.

Based on the changes above, there will be significant changes in the workings and methodology of CRC. In light of such changes we would recommend the following:

- CRC should consider investing in the training of its personnel for conducting research on external sources, data gathering, data analytics and then using this data for performing a quantitative and qualitative comparative analysis.
- CRC may consider to potentially conduct nation-wide surveys that enables them to form more accurate views and obtain more accurate data on the actual size and type of the subscriber market and the respective shares of the cable operators in the market.
- Such a survey could be carried out independently by CRC, or in a public-private partnership with an established and reliable external party on pre-agreed methodologies, criteria and objectives.
- We would recommend improved efforts on collaboration between CRC and the National Revenue Agency (NRA). Revenue under reporting is a national issue as it impacts state taxation (VAT, Personal Income Tax, Social Securities, etc). As such, the matter is of key importance, jointly to both organisations.
- The NRA has immense experience in such matters and large amount of resources at their disposal (both in the form of human skills and relevant data). An open discussion, leading to collaboration will escalate the importance of this matter and allow both agencies to develop a mutually beneficial partnership.

We believe that considering the recommendations above for deciding on potential actions in the short and long term is in the wider interests of all players in this industry regardless of who they are. Such changes would strengthen the powers of the regulators and the competent enforcement agencies and their ability to undertake prompt, efficient and deterrent actions against all violations of the applicable legislation and regulations. It will also result in reduction of financial reporting violations.

7. General and Specific Limitations to Our Report

This update of the Report has been prepared for the purpose of informing you about the results of the analysis specified in the Engagement Letter between TeRaPro and EY.

To serve to its client, EY worked on the databases, information and data as provided by TeRaPro and performed sound statistical analysis to reach conclusions. However, it should be noted that none of the statistical methodologies employed in this study would lead us completely reliable results, rather provide us indications. Therefore, calculated figures by EY should be read as indicative figures rather than facts. Therefore, whoever person or organization that would rely on this report should consider calculations provided in this report as approximations.

We aim to provide you with an analysis on potential revenue losses being suffered by content owners annually due to potential irregularities in revenue reporting by cable operators.

For the purposes of our analysis we have used publicly available information (as disclosed in our sources section). However, we have not undertaken any field work and as such, we cannot verify or guarantee either the completeness, or the reliability of such information unless a systematic research and/or countrywide survey is carried out.

We have used reports and information that has been published on various websites (those of regulatory bodies, or cable operators. All sources used have been disclosed in the report). All information has been accepted at face value as shown on such websites. We have not verified the validity or authenticity of this information as it was not part of our scope of work.

Additionally, there are some limitations and constraints imposed on our work by industry specific issues as shown below:

Timing issues: The data from CEM (Council for Electronic Media) and CRC (Communications Regulation Commission) is reflective of different periods of time (data as of the end of 2018 in CRC vs. data within the first 8-10 months of 2019 in CEM varying widely from distributor to distributor).

Lack of unified cost per unit: Cable operators offer differing prices for different packages and combinations of channels. In order to estimate the monetary value corresponding to the number of subscribers reported to the authorities, we came up with a simplified model of three representative packages which is based on the prices and packages available in the market and which we obtained from the cable operator websites. Because of the varying prices and channel bundles within the different content distributors we calculated an average per unit for the three packages we used in the model (Basic; Standard; Advanced packages). In order to arrive at a pricing of these three packages, we used the weightage of the 47 operators represented as a percentage

of the total subscriber market (as per 2018 CRC Report) and the packages on offer (available at the websites of the operators) in order to determine a reasonable price for each package.

The Phantom effect: Some of the information published by both in CEM and CRC does not match the names of cable operators in the market. This would either be caused by existence of cable operators for which there is either no data in CEM, or in CRC. It may also be caused by usage of different names for the legal entity and the commercial entity of the same cable operator.

Our procedures neither intend, nor seek, to express an audit opinion on the information presented and, therefore, do not constitute an audit and do not provide any assurance, other than that explicitly described in our report.

We have based our work on the information available as disclosed in the report and the limitations of this information mentioned above. Our work is constrained by such limitations. As such we do not assume any liability or risks which may potentially exist due to the accuracy or validity of such information.

Our report is prepared solely for use in accordance with the terms of the agreement between TeRaPro and EY. Our report is provided on the basis that it is only for the intended use as specified and agreed between the two parties in our Engagement Letter dated 20 October 2019.

We acknowledge that you might need to disclose our Report to third parties (members of TeRaPro as well as regulatory bodies, government agencies and officials, etc.).

You undertake to ensure that any third party, to whose hands our Report may come into, shall be made aware that our Report addresses issues specific to our client TeRaPro only. In preparing the Report EY did not, and could not, take into account any specific requirements that a third party (including TeRaPro members) may have on the subject of the Report. Accordingly, the Report may not address issues of relevance to any third party. The Report reflects information as of the date of issuance. EY assumes no obligation, responsibility or duty of care towards any third party. It is third party's sole responsibility to decide whether the Report may possibly serve its purposes. Any use a third party makes of the Report is entirely at its own risk. If any third party suffers any damages as a result of use or reliance of our Report, it shall not have a right to hold EY responsible for that.

Lastly, our report is based on publicly available data which and we emphasise the fact that an empirical market study is required to arrive at conclusions that would be considered factual and accepted by all stakeholders.