PÓST- OG FJARSKIPTASTOFNUN

Draft Decision

Review of the Míla wholesale tariff for trunk segments of leased lines (previously Market 14)

16 April 2018

TABLE OF CONTENTS

page

1 Introduction

Míla ehf. cost analysis (Míla) for trunk segments of leased lines here under discussion is based on the obligations imposed on the company with the Decision of the Post and Telecom Administration (PTA) no. 21/2015, 12 August 2015, on the designation of a company with significant market power and on the imposition of obligations on the wholesale market for trunk segments of leased lines.

The Míla products dealt with in this cost analysis are leased lines, Metropolitan Data Highway (MDH) and Ethernet service (MPLS-TP), along with a new service called Sync-Ethernet and which will be provided on ports in Míla Ethernet service. These products belong to the wholesale market for trunk segments of leased lines, which is Market 14 pursuant to the EFTA Surveillance Authority (ESA) Recommendation from 2004 (Market 14/2004).

The PTA opened a national consultation on the preliminary draft to the Decision here under discussion on 14 February and the consultation ran until 14 March 2018. PTA did not receive any comments from the operators during the consultation, apart from a conformation from one operator that they had reviewed the draft decision and did not have any points to object to.

The following sections cover the legal grounds, methodology and calculations that led to the PTA conclusion. The text of the Draft Decision describes the intended PTA position which can be subject to amendment until the final Decision is made, among other things as a result of comments from stakeholders. The wording of the Draft should be read with this in mind.

1.1 PTA Decision no. 21/2015

On 12 August 2015 the PTA made Decision no. 21/2015 on the designation of undertakings with significant market power and on the imposition of obligations on the wholesale market for trunk segments of leased lines (Market 14/2004).

The PTA came to the conclusion that the definition of Market 14 to be found in the ESA Recommendation[1] applied in this country. The PTA decided to designate Míla as having significant market power on the wholesale market for trunk segments of leased lines (Market 14/2004).

With the authority of Article 32 of the Electronic Communications Act the PTA imposed the obligation on Míla for a cost-oriented wholesale tariff for trunk segments of the company's leased lines. When deciding prices for trunk segments of leased lines, the cost analysis methodology shall be used which is based on historical costs allocated to the relevant service (HCA FAC).

When implementing its cost analysis Míla shall base its methodology on Chapter IV of Regulation no. 564/2011 on bookkeeping and cost analysis in the operations of electronic communications companies, such as on evaluation of operational assets, useful life and ROI

[1]See the EFTA Surveillance Authority recommendation on the relevant markets from 14 July 2004.

requirement. Furthermore, account shall be taken of the PTA position on criteria and calculations in the PTA Decision no. 14/2011 with respect to cost analysis for trunk segments of leased lines.

If the Míla cost analysis for trunk segments of leased lines returns a conclusion that the PTA considers unacceptable with a view to price development and tariffs on analogous competition markets, the PTA can require a review of that conclusion. The Administration will in such instances request that Míla review the criteria used for evaluating the investments needed to provide the service in question, in order to return a conclusion which harmonises with the views and objectives of the EU Commission with respect to supporting competition and improving the investment environment on the electronic communications market.

The Míla cost analysis for wholesale tariff for trunk segments of leased lines shall be based on the following main criteria:

- Allocation of costs shall be based on separation of accountancy for the trunk line network, on Míla asset bookkeeping and on costs from Míla's bookkeeping system where operational costs are entered in bookkeeping accounts.
- The cost base shall be Míla historical costs (HCA).
- Operational costs shall be based on the preceding financial year in each instance. The methodology shall be based on allocating all costs to the service in question (FAC).
- When evaluating investments for leased lines, the reference shall be adjusted booked cost but one shall also take into account the gross replacement cost of operational assets in the light of next generation networks (NGN).
- A depreciation methodology shall be used that reflects the value in use of an asset.
- The annuity method shall be used to calculate annual investment costs.
- The cost of the trunk line network shall be captured, including share of common costs, management, IT and senior management in accordance with separation of accountancy.
- The required rate of return used shall be based on weighted average cost of capital[2] (WACC real) from capital bound in assets used in connection with provision of service where the risk premium reflects the risk related to operations on the relevant market.
- The number of lines shall be calculated taking into account line equivalents. In assessment of line equivalent coefficients, one shall normally take into account costs in proportional context to the capacity and length of leased lines. In the case of new service, it is authorised to take into account an estimate of the number of connections.

[2] In accordance with Article 16 of Regulation no. 564/2011 the PTA decides on an annual basis the weighted average cost of capital (WACC) which electronic communications companies should use as a reference in their calculations.

- Average base unit cost for the whole country and/or for individual categories of connection routes, shall be calculated from allocated operational and investment costs divided by number of lines or their line equivalents.

Míla shall ensure at any given time that the tariffs list all wholesale service on the market for trunk segments of leased lines on offer by Míla to its own units and related companies. Míla is furthermore obliged to review the product offer in its tariff in step with market requirements at any given time and if reasonable requests are received in accordance with the access obligation. All additions and amendments to the tariff shall be endorsed in advance by the PTA and do not come into force until such an endorsement has been provided, subsequent to national consultation and consultation with ESA and with other electronic communications regulatory bodies in the EEA.

Míla is authorised to offer categories of paths if they are based on cost criteria and non-discrimination between parties..

The Míla tariffs for leased lines shall be easy to understand and shall take into account the following main principles:

- They shall be based on costs and on objective criteria such as distance and capacity.
- They shall take into account all service items included in the relevant service.
- They shall in general be divided into: setup charge (installation) and subscription charge (fixed lease charge for a specific period of time). Where another division is used (such as price per kilometre) it shall be based on objective criteria.

It was stated in the Decision that the Míla tariff for leased lines is now generally divided into setup charge, subscription charge per month and kilometre charge per month. Exceptions to this rule are that the lease of dark fibre is based solely on a setup charge and the distance charge (divided into urban and rural) and the tariff for Metropolitan Data Highway (MDH) is based on a setup charge and then a subscription charge per month. The PTA considers that Míla should in the coming years, aim towards amendments in its tariffs such that there will only be a price for a subscription charge per month independent of distance, where possible, and based on capacity and on the service items included in the service in question.

It was also prescribed that the Míla tariff for trunk segments of leased lines should be reviewed no later than by the end of 2016 and subsequently on an annual basis in accordance with revisions of cost analyses in line with the development of quantity and cost. New wholesale tariffs for trunk segments of leased lines will not come into force prior to endorsement by the PTA subsequent to national consultation and consultation with ESA in each instance.

Concurrently with the Decision of the PTA no. 21/2015, decisions were published by the Administration on wholesale tariffs on the relevant market, i.e. PTA Decisions nos. 22, 23, 24 and 25/2015.

1.2 PTA decisions currently in force on wholesale tariffs on Market 14/2004

The existing Míla tariff for the trunk line market is based on the following PTA decisions:

- PTA Decision no. 22/2015 on review of Míla wholesale tariff for trunk segments of leased lines dated 12 August 2015.
- PTA Decision no. 23/2018 on Míla tariff for Ethernet services on the wholesale market for trunk segments of leased lines, dated 12 August 2015.
- PTA Decision no. 25/2015 on Míla tariff for temporary connections on the wholesale market for trunk segments of leased lines dated 12 August 2015.
- PTA Decision no. 32/2015 on review of Míla wholesale tariff for MDH connections on the market for trunk segments of leased lines dated 22 December 2015.

1.2.1 Míla wholesale tariff for trunk segments of leased lines

The following table shows the Míla tariff for trunk segments of leased lines pursuant to the PTA Decision no. 22/2015:

Service product	*Price line*	*Price km*
64 kb/s	2,911	114
64 Gb/s connection	4,366	171
128 kb/s	3,976	156
128 Gb/s, protected connection	5,964	234
256 kb/s	5,432	213
256 Gb/s protected connection	8,147	320
512 kb/s	7,420	291
512 Gb/s protected connection	11,130	437
2 Mb/s	13,699	538
2 Gb/s protected connection	17,124	672
2 Mb/s interconnection current	6,849	538
45 Mb/s	40,733	1,599
45 Gb/s protected connection	61,100	2,399
155 Mb/s	57,565	2,260
622 Mb/s	91,053	3,575
2.5 Gb/s	144,101	5,658
Fibre-optic, rural		8,850
Fibre-optic, urban		20,528
Fibre-optic, 1 thread rural		7,538
Fibre-optic, one thread urban		17,484

Service product	*Price line*	*Price km*
Ethernet 2 Mb/s	13,699	538
Ethernet 6 Mb/s	22,459	882
Ethernet 10 Mb/s	28,263	1,110
Ethernet 20 Mb/s	30,668	1,204
Ethernet 26 Mb/s	33,617	1,320
Ethernet 28 Mb/s	34,501	1,355
Ethernet 30 Mb/s	35,344	1,388
Ethernet 46 Mb/s	41,048	1,612
Ethernet 48 Mb/s	41,664	1,636
Ethernet 50 Mb/s	42,263	1,659
Ethernet 100 Mb/s	49,813	1,956
Ethernet 150 Mb/s	56,945	2,236
Ethernet 200 Mb/s	62,616	2,458
Ethernet 300 Mb/s	71,581	2,810
Ethernet 400 Mb/s	78,709	3,090
Ethernet 0.5 Mb/s	84,724	3,326
Ethernet 1 Mb/s	106,499	4,181
Ethernet 2 Mb/s	133,871	5,256
Ethernet 4 Mb/s	168,277	6,607
Ethernet 5 Mb/s	181,136	7,112
Ethernet 6 Mb/s	192,369	7,553
Ethernet 7 Mb/s	202,408	7,947
Ethernet 10 Mb/s	227,691	8,940

The above tariff is based on geodesic distance between endpoints of trunk lines on the path in question. The distance is to be measured as the shortest distance between the locations that the line reaches.

The setup charge for trunk segments of leased lines is ISK 96,386.

1.2.2 Míla wholesale tariff for Ethernet service

According to PTA Decision no. 23/2015, Míla is authorised to collect the following charges for its Ethernet service (MPLS-TP):

Setup charge

The setup charge for Ethernet service is ISK 96,000.

The conversion fee from leased lines to Ethernet service is ISK 36,000.

Monthly charge

Price for connection

Locations on the Fibre-optic Ring

Data transfer speed (Mb/s)	Monthly price (ISK)		
	0-49 km	50-99 km	100+ km
100	52,608	78,913	105,217
200	69,417	104,126	138,834
300	81,640	122,460	163,280
400	91,597	137,395	183,193
500	100,148	150,222	200,296
600	107,725	161,587	215,450
700	114,576	171,864	229,152
800	120,862	181,294	241,725
900	126,693	190,039	253,386
1000	132,146	198,220	264,293
2000	174,368	261,552	348,736
3000	205,071	307,606	410,142
4000	230,080	345,120	460,160
5000	251,561	377,341	503,122
6000	270,592	405,889	541,185
7000	287,802	431,704	575,605
8000	303,593	455,389	607,185

Locations not on the Fibre-optic Ring

Data transfer speed (Mb/s)	Monthly price (ISK)		
	0-19 km	20-49 km	50+ km
10	14,721	29,442	44,163
20	19,424	38,849	58,273
30	22,845	45,689	68,534
40	25,631	51,261	76,892
50	28,024	56,047	84,071
60	30,144	60,287	90,431
70	32,061	64,122	96,182
80	33,820	67,640	101,459
90	35,451	70,903	106,354
100	36,977	73,955	110,932
150	43,488	86,976	130,465
200	48,792	97,584	146,376
300	57,383	114,766	172,149
400	64,381	128,762	193,144
500	70,392	140,784	211,176
600	75,717	151,435	227,152
700	80,533	161,066	241,599
800	84,952	169,903	254,855
900	89,050	178,099	267,149
1000	92,883	185,766	278,648
2000	122,560	245,119	367,679
3000	144,140	288,280	432,419

Price for port

Data transfer speed	Monthly price (ISK)
1 Gb/s	7,000
10 Gb/s	35,000

The above prices are on the basis of guaranteed bandwidth. The price for over-booking will be 10% of the tariff for guaranteed bandwidth.

1.2.3 Míla wholesale tariff for temporary connections

According to PTA Decision no. 25/2015, Míla is authorised to collect the following charges for temporary connections:

Temporary connections for individual transmissions from specific locations

	Capital city-Region	Countryside		
		0-50 km	50-99 km	100- km
First 24 hours	62,122	121,375	161,062	200,750
Per day in excess of 1	12,849	31,750	47,625	63,500
Order within 10 working days	36,000	36,000	36,000	36,000
Order within 2 working days	60,000	60,000	60,000	60,000

Locations with fixed connections:

Place	Club	Address
Fjölnisvöllur	Fjölnir	Dalhús 2
Kópavogsvöllur	Breiðablik	Dalsmári 5
Hásteinsvöllur	IBV	Hamarsvegur
Framheimilið	Fram	Safamýri 26
Samsungvöllur	Stjarnan	Ásgarður
Hlíðarendi	Valur	Hlíðarendi
Víkingur	Víkingur	Traðarland 1
KR - heimili	KR	Frostaskjól 2
Laugardalsvöllur	KSI	Reykjavegur 15
Laugardalshöll	HSI	Engjavegur 8
Kaplakriki	FH	Kaplakriki
Fylkisvöllur	Fylkir	Fylkisvegur 6
Egilshöll	All	Fossaleyni 1
Digranes	HK	Digranesvegur
Austurberg Sportshall	ÍR	Austurberg 1-3
Ásvellir	Haukar	Ásvöllur 1
Grindavík	UMFG	Ásabraut 2
Akranes	IA	Jaðarbakkar
Keflavík	Keflavík	Sunnubraut 34
Njarðvík Sportshall	Njarðvík	Norðurstígur 2
Þorlákshöfn Sportshall	Þór	Hafnarberg 41
Kórinn		Vallarkór 12
AK Sportshall	Þór / KA	Hamar / Hólabraut
Althingi		Kirkjustræti
Town Hall		Tjarnargata 11
Reykjavík City Theatre		Listabraut 3
The National Theatre		Hverfisgata 19
Háskólabíó		Hagatorg
Harpan		Austurbakki 2

Agreements on transmissions at specific locations

	Capital city area	Countryside		
		0-49 km	50-99 km	100- km
First transmission per connection location	40,098	82,700	114,450	146,200
Each additional transmission	10,279	25,400	38,100	50,800

Other temporary connections

Price for first-day	Capital city area	Countryside		
		0-49 km	50-99 km	100- km
Ethernet 30 Mb/s	111,722	122,650	135,782	148,914
Ethernet 150 Mb/s	121,094	138,701	159,859	181,016
Fibre-optic lines	128,508	175,761	215,448	255,136

Price for additional day	Capital city area	Countryside		
		0-49 km	50-99 km	100- km
Ethernet 30 Mb/s	6,134	10,506	15,758	21,011
Ethernet 150 Mb/s	9,883	16,926	25,389	33,852
Fibre-optic lines	19,276	26,364	32,317	38,270

If implementation cost for these connections exceeds ISK 100,000, Míla will collect the difference separately.

1.2.4 Míla wholesale tariff for Metropolitan Data Highway

According to PTA Decision no. 32/2015, the Míla tariff for Metropolitan Data Highway connection is as follows:

Setup charge: ISK 107,000 per connection.

1 Gb/s connection: ISK 95,000 per month.

10 Gb/s connection: ISK 120,000 per month.

100 Gb/s connection: ISK 655,000 per month.

1.3 Facts of the case

In a letter from the PTA to Míla dated 21 December 2017, the Administration pointed out to Míla that pursuant to PTA Decision no. 21/2015 the tariff on the wholesale market for trunk segments of leased lines must be reviewed by the end of 2016.

In a reply from Míla on the same day, the company requested notice until April 2017 to submit the cost analysis for this market in order that the analysis could take into account figures on operations for the year 2016.

In a letter from the PTA to Míla dated 21 December 2016, the Administration granted Míla the requested notice. The PTA then pointed out that the analysis needed to be a single comprehensive analysis where allowance was made for easy updating with new data.

In an email from Míla to the PTA, the company requested notice until May 2017 to submit the cost analysis of this market. The reasons for this delay were among other things, work on updating cost analyses for Markets 4, 5 and 6, and unmanageable circumstances.

On 30 May 2017, Míla requested an additional two weeks' notice, which was granted by the PTA.

On 12 June, Míla submitted a cost analysis for leased lines, Ethernet service and the Míla Metropolitan Data Highway (MDH).

The PTA and Míla exchanged a number of emails during the period October 2017 until January 2018, which discussed price categories and tariff for Ethernet service outside the Fibre-optic Ring, definition of locations on the Fibre-optic Ring and outside it, connection of locations in the West Fjords to the Fibre-optic Ring, Míla investments for locations outside the Ring, Míla involvement in state funded projects, Sync-Ethernet, the number of leased lines in the West Fjords, the number of MDH connections etc. There is more detailed discussion on these issues in the appropriate sections here below.

On 26 January 2018, Míla submitted a revised cost analysis where improvements had been made in accordance with comments from the PTA. Finally, Míla submitted a corrected cost analysis for leased lines on 7 February 2018.

2 General

The Míla cost analysis is divided into the main Míla services on this market, i.e. Ethernet service (on and outside the Fibre-optic Ring), Sync-Ethernet, MDH and other lease lines in the trunk line network.

Míla states that the cost analysis is based in all significant aspects on the same methodology as in previous analyses.

In addition to tariffs for the Ethernet service which is already on offer, Míla submitted cost analysis for what is called Sync-Ethernet service which Míla requests to offer.

Míla points out that operations on the trunk line market are to a degree common to these products and for this reason the analysis had been made such that separate calculations were made for prices for Ethernet service and for MDH and that estimated revenue from these service items was deducted from the total cost base of the trunk line network along with other revenue on this market. The calculations are examined in more detail in the sections here below.

Changes to setup charges and other one time charges are not foreseen.

In the sections here below, one can find the criteria and conclusions of the PTA on the cost analysis here under discussion. Discussion on the cost analysis is divided into sections according to Míla services on this market. For each service there is discussion on the main aspects that the PTA considers important as criteria for the position taken by the Administration on tariff calculations for the service in question. The factors in question are the following:

1. Opex
2. Capex
3. Line equivalent
4. Total costs and calculation of unit prices.

Each sub-section is structured with a description of the Míla cost analysis coming first and then followed by the position of the PTA for each issue.

The same rate of return is used for all Míla services.

3 Weighted average cost of capital

In its calculations, Míla allows for 7% weighted average cost of capital (WACC) for the year 2016. This is in accordance with PTA instructions and reference is made in this connection to Section 2.2 in PTA Decision no. 5/2017 on review of Míla wholesale tariff for copper local loops.

4 Locations not on the Fibre-optic Ring

In the Decision of the PTA no. 23/2015, a new Míla Ethernet service was introduced, which is based on MPLS-TP technical equipment.

Supply of Míla Ethernet service is divided into two categories, locations on the Fibre-optic Ring and locations outside the Ring. Locations on the Fibre-optic Ring are discussed in Section 5 here below.

This service was initially offered at 46 locations outside the Ring. Locations have gradually increased and this cost analysis is based on 75 locations.

In an email from the PTA dated 17 October 2017, the Administration requested clarification on the conditions that decided whether a location is defined as being on the Fibre-optic Ring or outside it. There have been changes to the definition of at least two locations which were previously defined as being outside the Ring and that are now defined as being on the Ring. Then there are locations e.g. Staður which is on the Ring but nevertheless defined as being outside the Ring.

In a reply from Míla dated 18 October 2017, it is stated that Míla considers the structure to be a decision for the company, i.e. which locations are on the Ring and which are outside it. Staður is not an urban location which means that significant capacity for delivery will not be developed there. There is a minimum of 100 Mb/s offered on the Ring, but the need at Staður is less than 100 Mb/s. In addition to this there is little demand at that location and today it is only used by Míla.

It was also stated by Míla that the idea was that development on the Ring is developed with the intention of having capacity to deliver at main urban kernels and thus in step with needs. Efforts are also made to define the Fibre-optic Ring to include locations that have developed facilities.

The PTA raises no objections to the current definition of locations on the Fibre-optic Ring and outside the Ring. The manner in which this division is implemented can however influence costs for customers, and for this reason the PTA considers it important that the criteria that decide this definition are clear and reasonable.

4.1 Opex

4.1.1 Míla cost analysis

In the Míla cost analysis it is stated that opex for Ethernet service outside the Ring is divided into lease of fibre-optic, hosting and electricity, service agreements for equipment and other opex, such as a share in the Network Operations Centre (NOC), common costs and general maintenance costs.

Fibre-optic rental

Míla states that by far the largest cost item in Ethernet service is lease of fibre-optic pair. Lease of fibre-optic between all locations with existing fibre-optic is assumed. At two locations, Miðfell and Sólheimar, there is microwave connection and allowance is made for investment in microwave equipment at those locations.

The Míla unit price is based on estimated price for fibre-optic according to analysis of prices for leased lines and fibre-optic in Section 10.

In the revised Míla analysis dated 26 January 2018, it is stated that total costs per annum for lease of fibre-optic are ISK [...].

Hosting and electricity

Míla allows for hosting costs for equipment and costs for electricity consumption. It is assumed that equipment will require [...] of 1 shelf unit which means that the lease price is [...] of 60x60 shelf unit which makes a total of ISK [...] according to the Míla tariff now in force for lease of facilities.

Energy consumption of each equipment unit is estimated at [...] W and the cost for this totals ISK [...] per annum.

Service agreements

Míla states that service agreements have been made about the equipment. The cost for a service agreement is [...] EUR per annum which means that according to the average exchange rate in 2016 the cost of service agreements is therefore ISK [...].

Míla does not allow for service agreement costs for new locations as there is now a provision in agreements that there will be no additional costs for increase of locations.

Other costs

In the Míla cost analysis dated 9 June 2017 the following is stated with respect to other opex:

"The main undecided factors in costs for Ethernet service are costs for maintenance, senior management, network operations centre (NOC) and other common costs. Opex for Ethernet service is very much intertwined with opex for other leased line connections and it is very difficult to isolate this cost except to a very small degree. In the opinion of Míla, one must calculate the share of Ethernet service in general, opex for the trunk line network, with the exception of hosting costs and costs for service agreements as those costs are calculated separately. Míla considers it normal to relate other opex to a percentage of investment annuity.

The conclusion is that the proportion of opex/annuity for equipment (SDH, MPLS-TP, MDH etc.) is [...].

	Opex	Common costs	Hosting/server	Net opex	Annuity	Proportion
Fibre-optic	[...]	[...]	[...]	[...]	[...]	[...]
Equipment	[...]	[...]	[...]	[...]	[...]	**[...]**
Control network	[...]	[...]	[...]	[...]	[...]	[...]
Microwaves	[...]	[...]	[...]	[...]	[...]	[...]
Connections	[...]	[...]	[...]	[...]	[...]	
	[...]	[...]	[...]	[...]	[...]	

This proportion is considerably higher than in the 2014 analysis where costs for these items totalled [...] which was only [...]% of the annuity. The explanation of this large increase is that the major part of costs for the trunk line network was booked on cost centres which were not directly linked to equipment, microwave connections or fibre-optic and this was not taken into account when the proportion was calculated in the last analysis. Not including senior management, these costs total ISK [...] million and they are distributed to product categories in the same proportion as other opex. The share of equipment is ISK [...] million in these costs. It is normal that Ethernet service should participate in these costs, like other products. The investment annuity is lower now than in the 2014 analysis, which results in an increase in this proportion. Using the same methodology, the proportion now would be [...]. A number of factors explain this increase in proportion between annuities and opex less hosting and service agreements:

- *Investment annuity decreases by about ISK [...] million between analyses.*
- *Opex, less service agreements and premises rent, increases by about ISK [...] million. In the analysis of Ethernet service, opex for the period July to December 2013 was used - adjusted to cost per annum.*
    - *Labour for operation of equipment increased. Transferred labour increased by about ISK [...] million and cost of materials by about ISK [...] million (against this, senior management costs decreased by about ISK [...] million). The explanation of the increase can to some extent be attributed to the transfer of the trunk line network to Míla in 2013 and to increased scope of operation of equipment related to MPLS-TP equipment and MDH equipment.*
    - *Access to 48 Volts was lacking in the 2013 calculations [...].*
    - *A cost reduction of approximately ISK [...] million is allowed for in the analysis.*
- *Common costs increased by about ISK [...] million. To a large extent one can attribute the increase to the fact that employees now distribute their work on the systems to a greater degree in the form of transferred labour, while against this senior management costs of the trunk line network decrease by about ISK [...] million.*
- *Senior management costs for the trunk line network decreased by about ISK [...] million, of which senior management costs distributed on equipment decreased by about ISK [...] million.*

The table below shows changes to the main items, given that the 2014 analysis was calculated using the same methodology as now:

Comparison with 2014	Annuity	Opex ex server/premises rental	Senior management	Common costs	Total opex	Proportion
Analysis 2014	[...]	[...]	[...]	[...]	[...]	[...]
Analysis 2016	[...]	[...]	[...]	[...]	[...]	[...]
Change	[...]	[...]	[...]	[...]	[...]	

Other opex cost is thus ISK [...]

4.1.2 The position of the PTA

The PTA has scrutinised Míla opex for Ethernet service outside the Fibre-optic Ring. It is stated in the Míla cost analysis that opex for the system is divided into lease of fibre-optic, hosting and electricity, service agreements for equipment and other opex, such as share in NOC, common costs and general maintenance costs. This is in accordance with the division used in the last Míla analysis for this product.

Fibre-optic rental

As stated by Míla, the fibre-optic is by far the largest cost item in this system. The fibre-optic lease is based on the tariff for a fibre-optic pair in the countryside: A discount of 15% is allowed for. New locations to be offered by Míla are taken into account. The PTA has examined the cable routes used to calculate fibre-optic lease. In an email from the PTA to Míla dated 23 November 2017, the PTA made a comment related to the cable routes in the cost calculations for fibre-optic lease. In an e-mail dated 27 November 2017, Míla submitted a revised cost analysis for Ethernet service outside the Fibre-optic Ring with corrected cable routes where one cable route was added and another deleted. The calculations for fibre-optic costs were then revised in the cost analysis dated 26 January 2008, according to recalculation of fibre-optic unit prices. According to the above, the annual cost for fibre-optic was estimated at about ISK [...] million.

Hosting, electricity and service agreements

Hosting is calculated on the basis of the tariff for hosting in facilities. The cost for hosting is calculated on the basis of the dimensions of the equipment used and of the location.

Electricity cost is calculated from the estimated energy consumption of the equipment used for providing this service and from the Míla tariff.

Annual costs for hosting and electricity are estimated at about ISK [...] million.

Costs for service agreement are about ISK [...] million per annum. These costs are calculated from costs of the agreement in EUR, converted to ISK.

Other opex

Míla estimates these costs on the basis of a proportion of analogous costs in the Míla cost analysis for leased lines. The same methodology is used as in the last cost analysis, but costs increase significantly because of the higher proportion of opex against annuity which is because annuity on equipment has decreased at the same time as total opex has increased. The conclusion is that the share of Ethernet service outside the Fibre-optic Ring in common opex for leased lines is estimated at ISK [...] million per annum.

Total opex

According to the above, annual Míla opex for Ethernet service at locations outside the Fibre-optic Ring is estimated at ISK [...] million which is ISK [...] per location. By comparison, opex in the last cost analysis was about ISK [...] million or about ISK [...] million per location. The increase may mainly be attributed to increase costs for fibre-optic which is commensurate with the increase in locations which offer this service, and in addition to this Míla is now offering service at locations that are further away from the Fibre-optic Ring, e.g. in the West Fjords. It is worthy of note in this connection that the number of kilometres of leased fibre-optic has more than doubled between analyses, and the number of locations has increased by about 63%.

The PTA raises no objections to the methodology used by Míla for calculating opex.

4.2 Investment costs

4.2.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017 the following is stated on Míla capex for Ethernet service outside the Fibre-optic Ring.

"*As was stated in the 2014 analysis, Míla MPLS-TP equipment used for Ethernet service has the characteristics that it can also be used for Synchronous Digital Hierarchy lines (SDH). For this reason, an evaluation is made in the analysis of a normal share for Ethernet service in the total investment. When making the evaluation, it was taken into account whether it had been necessary to renew the SDH equipment or whether the investment had first and foremost been for development of Ethernet service. For this reason, the share of Ethernet service varied significantly by location.*

Equipment for Ethernet service has not been installed at a number of locations, Ferstikla, Hnjúkar, Axlarhólar, Hellissandur, Miðfell, Úlfljótsvatn, Hvanneyri, and Stokkseyri. It is assumed that the investment base at these locations is ISK [...].

Then allowances made for 5 new locations in Ethernet service, Raufarhöfn, Bakkafjörður, Vopnafjörður, Þórshöfn and Stokkseyri. Equipment has already been installed at Raufarhöfn, Þórshöfn, Bakkafjörður and Vopnafjörður and investment base is assumed to be real investments at those locations. Investment base at Stokkseyri is evaluated at ISK [...].

Investment base for Ethernet service outside the Fibre-optic Ring amounts to a total of ISK [...].

Useful life of equipment is assessed at 8 years while in the 2014 analysis this was evaluated at 6.67 years. Míla considers that significant experience has now been gained of the equipment and that it can last for 8 years and for this reason, lengthens the useful life accordingly.

Annuity on investments is ISK [...]."

4.2.2 The position of the PTA

Investments for Ethernet service outside the Fibre-optic Ring are based on a mixture of actual amounts and estimates. There has been a significant increase in locations since the last analysis, which means that there is more information available on real costs. The total investment in equipment in the last analysis was about ISK [...] million and the average investment for each location was about ISK [...] million. Now the total investment is about ISK [...] million and the average investment for each location about ISK [...] million.

With an email dated 18 October 2017, Míla submitted a document with a detailed breakdown of investments for Míla Ethernet service at the request of the PTA. This shows real costs at each location and the division of costs between SDH and MPLS-TP.

The PTA has examined Míla capex and raises no objections to the capex specified by Míla for the locations where equipment has been installed. Nor does the PTA raise objections to the Míla estimates in capex at those locations where equipment has yet to be installed, i.e. that this is reckoned at ISK [...] million.

The average investment for each location outside the Fibre-optic Ring is lower than for locations on the Fibre-optic Ring as Míla is investing in less expensive and lower capacity equipment outside the Fibre-optic Ring.

In the cost analysis, Míla requests an amendment to the useful life of MPLS-TP equipment from 6.67 to 8 years. Míla bases this on experience gained of the equipment. It is generally not desirable to change calculated useful life during the lifetime of investments as this could distort calculations. There are however precedents for this, such as useful life of fibre-optic. The PTA intends to endorse this amended useful life, particularly in the light of the fact that revenue from this service is deducted from costs in the cost analysis for leased lines, which means that this is in fact only a division of costs between Míla service items.

Given an 8 year useful life and 7.0% WACC, then the annuity on investments for Ethernet service at locations outside the Fibre-optic Ring is approximately ISK [...] million.

4.3 Line equivalent

4.3.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017 the following is stated on Míla line equivalent for Ethernet service outside the Fibre-optic Ring:

"Míla considers it appropriate to calculate the number of connections in Ethernet service on the basis of the current status, as there were wide fluctuations in 2016 between product

categories. Míla therefore uses the status in March 2017. Number of lines in March 2017 is as follows:[...]

Number of 10 Gb/s ports was [...] and 1 Gb/s [...].

As one can see in the tables here above, one additional category has been added, Ethernet service outside the Fibre-optic Ring, i.e. connections that have a distance in excess of 85 km.

Míla considers it necessary to add this category as there have been requests for Míla to offer Ethernet service to locations which are at great distances. Because the distances are long, Míla has not felt that it was able to offer this service to locations at such a long distance from other locations. By adding a category for connections in excess of 85 km, Míla can offer this service to those locations without the service having to bear substantial losses from fibre-optic costs. Míla expects calculations for line equivalents to be structured in the same manner as in previous analyses and that Category 4 (85 km or greater) would be 4 times more expensive than Category 1.

The exponent will continue to be 0.4 and excess information rate (EIR) will be 10% of the price for the Ethernet service.

The number of line equivalents will, according to the above, total [...].

From January 2016 to February 2017, revenue from Ethernet service outside the Fibre-optic Ring has increased by more than [...]%. It is foreseeable that the increase will begin to decelerate during the next months. Míla therefore considers it normal to allow for [...]% increase in revenue for the estimated increase in connections. In addition to this, allowance is made for an increase in connections resulting from new locations, a total of [...] line equivalents. An allowance is therefore made for approximately [...]% increase in connections in the calculation of lease price.

The number of line equivalents will be [...] and the number of 10 Gb/s ports will be [...] and 1 Gb/s ports [...], and it is also assumed that ports will also increase by about [...]% with the addition of the estimated number of ports [...] for new locations."

In an email from Míla dated 18 October 2017 it was stated that in the cost analysis, allowance was made for the following connections being in Category 4:

Reykjahlíð - Raufarhöfn

Þórshöfn - Bakkafjörður

Ísafjörður - Blönduós

Ísafjörður - Búðardalur

Míla then stated that today [...] being sold that would belong to Category 4. The intention was however to sell [...] additional connections with the coming of this additional category. Míla however considered an increase in categories to be a prerequisite for being able to offer Ethernet service between locations where there are large distances, e.g. Raufarhöfn, Þórshöfn and West Fjords. If the fourth category was not added, then Míla did not feel able to offer this product as

the price for connections with such distances would be abnormally high and the increase in tariff for shorter connections would be too great. Shorter routes would then be subsidising longer routes.

Míla then pointed out that the tariff should be based on costs and that a four-category tariff as proposed by Míla would better reflect costs than the current tariff. Míla also considers that the structure of the tariff is in the remit of the company and that the PTA cannot reject such a tariff unless it fails to fulfil the obligation of being cost-oriented.

It was then stated by Míla that in the event of unaltered price categories, the tariff would be increased to a considerable extent.

In this email, Míla also replied to the PTA query on connecting the West Fjords with the Fibre-optic Ring. Míla stated that the connection with the West Fjords was completed and that sales of traditional connections had commenced in that area, as had the sale of Ethernet service from Patreksfjörður to Ísafjörður and from Hólmavík to Nauteyri. Míla was however interested in offering Ethernet service all the way, i.e. from Nauteyri to Ísafjörður. The prerequisite for this was having this fourth price category. Míla pointed out that the route Búðardalur-Patreksfjörður had been developed exclusively by Míla (predecessor) without state aid and in addition to this, 85 km of the new trunk line was developed by Míla (predecessor) without state aid, along with shorter routes e.g. Bolungarvík. In addition to this, Míla costs for laying fibre-optic in the State Trading Centre Call for Tenders were significant.

4.3.2 The position of the PTA

Míla uses the same exponent, 0.4, in calculating the coefficient for data transfer volume as was the case in the last cost analysis.

Míla proposes an amendment to price categories such that a fourth price category be added for connections that are 85 km or longer. The reason for this is a planned addition of locations that require longer connections that are thus more expensive as the cost of the underlying fibre-optic depends on the number of kilometres. As stated here above, Míla allows for these new locations in its cost analysis which results in a greater increase in the number of kilometres than in the number of locations, compared to the last analysis. The number of locations has increased by about 63% from the last analysis while the number of kilometres has increased by about [...] %, from [...] km to [...] km.

In the opinion of the PTA, there are cost arguments for adding a fourth price category and it is clear that an increase in the tariff for the first three categories would be considerably greater if this additional category were not added. Therefore the PTA raises no objections to there being four price categories.

In the instances where the analysis allows for the addition of locations, Míla estimates the number of sold connections at those locations. In addition to this, Míla estimates the increase in the number of sold connections in the light of the increase that has taken place.

The PTA makes no objections to Míla calculations and conclusion on line equivalents. Line equivalents for locations outside the Fibre-optic Ring are estimated at [...] compared to [...] in the last analysis, which is an increase of about [...]%.

4.4 Total costs

Total costs per annum comprise estimated opex for the year 2016 and annuity on Míla investments until the year 2016 including an estimate on additional investments for new locations. The figures are based on the Míla cost analysis received by the Administration on 26 January 2018.

Opex is calculated from costs for renting fibre-optic between locations, for hosting and electricity and for service agreements for equipment. The service also takes a share of common opex in the Míla trunk line system.

The annuity is calculated from the initial investment which comprises the investments made by Míla in developing the MPLS-TP system outside the Fibre-optic Ring and estimated investments at those locations covered by the analysis, but where equipment has not yet been installed.

The quantities of sold units are based on the status in March 2017.

4.4.1 Míla cost analysis

In the Míla cost analysis which was revised on 26 January 2018, it is stated that the annuity on investments is ISK [...].

In the cost analysis, there is also the following table with an overview of opex:

Opex	
Lease price of fibre-optic...	[...]
Hosting and electricity.....	[...]
Service agreements.....	[...]
Other costs....	[...]
	[...]

The total costs, according to the above are thus ISK [...] for the year 2016.

Total costs less the estimated revenue from ports amount to ISK [...].

The unit price for 100 Mb/s outside the Fibre-optic Ring is therefore ISK 38,518 according to Míla calculations and the increase thus about 4% from the existing tariff.

4.4.2 The position of the PTA

The Míla conclusion on tariff for Ethernet service is broadly based on the methodology endorsed by the PTA in the last cost analysis. Amendments and observations from the Administration have been taken into account as is stated above.

The conclusion of the cost analysis is that total cost of the Ethernet service for locations outside the Fibre-optic Ring is ISK [...] million. It is estimated that this cost will be recovered with monthly charges for ports on the one hand ISK [...] million per annum and on the other hand with monthly charges for connections ISK [...] million per annum.

When calculating monthly charges for connections [...] line equivalents are used which means that the monthly price for a base unit is ISK 38,518.

The tariff for Ethernet service for locations on the Fibre-optic Ring path will thus be:

Data transfer speed (Mb/s)	Monthly price (ISK)			
	0-19 km	20-49 km	50-84 km	85+ km
10	15,334	30,669	46,003	61,338
20	20,234	40,468	60,701	80,935
30	23,797	47,593	71,390	95,186
40	26,699	53,397	80,096	106,795
50	29,191	58,383	87,574	116,765
60	31,400	62,800	94,199	125,599
70	33,397	66,794	100,191	133,587
80	35,229	70,458	105,687	140,917
90	36,929	73,857	110,786	147,715
100	38,518	77,036	115,555	154,073
150	45,300	90,601	135,901	181,202
200	50,825	101,650	152,475	203,300
300	59,774	119,549	179,323	239,097
400	67,064	134,128	201,192	268,256
500	73,325	146,651	219,976	293,301
600	78,873	157,745	236,618	315,491
700	83,889	167,778	251,667	335,556
800	88,492	176,983	265,475	353,966
900	92,761	185,521	278,282	371,042
1,000	96,753	193,507	290,260	387,014
2,000	127,667	255,334	383,001	510,667
3,000	150,146	300,293	450,439	600,585
4,000	168,457	336,915	505,372	673,830
5,000	184,185	368,370	552,555	736,740
6,000	198,119	396,238	594,358	792,477
7,000	210,720	421,440	632,159	842,879
8,000	222,281	444,562	666,843	889,124
9,000	233,004	466,008	699,012	932,016
10,000	243,034	486,067	729,101	972,134

The above prices are on the basis of guaranteed bandwidth. The price for over-booking will be 10% of the tariff for guaranteed bandwidth.

The setup charge for Ethernet service remains unchanged at ISK 96,000.

As stated here above, the general increase is about 4.2% but with the addition of the fourth price category, some connections[3] show a greater increase, about 39%. This higher increase in price for these connections is caused by the transfer of these connections from Category 3 to Category 4. This change in category only applies to very few connections. The average increase on the basis of sold connections in March 2017 is about 5.6%. The last cost analysis related to cost figures for the year 2014 and the consumer price index increased by about 3.4% between 2014 and 2016 based on the average index of each year. At the same time the building price index has increased by about 8% using the same parameters.

As stated here above, the offer of locations has significantly increased, and because of their geographical location the cost of these new locations is more than that of the existing locations. With this in mind the PTA considers that the increase in the tariff is not abnormal and raises no objections to it.

5 Ethernet service on the Fibre-optic Ring

In the Decision of the PTA no. 23/2015, a new Míla Ethernet service was introduced, which is based on MPLS-TP technical equipment.

Supply of Míla Ethernet service is divided into two categories, locations on the Fibre-optic Ring and locations outside the Ring. Locations outside the Fibre-optic Ring are discussed in Section 4 here above.

The service was initially on offer at 17 locations on the Fibre-optic Ring, whereas now there are 22 locations categorised as being on the Ring.

5.1 Opex

5.1.1 Míla cost analysis

In the Míla cost analysis it is stated that opex for Ethernet service outside the Ring is divided into lease of fibre-optic, hosting and electricity, service agreements for equipment and other opex, such as a share in the Network Operations Centre (NOC), common costs and general maintenance costs.

Fibre-optic rental

Míla states that by far the largest cost item in the system is lease of fibre-optic pair. Lease of fibre-optic between all locations with existing fibre-optic is assumed.

Míla unit price is based on calculated price for fibre-optic according to the cost analysis of traditional leased lines and fibre-optic.

[3] [...]

In the revised Míla analysis dated 26 January 2018, it is stated that total costs per annum for lease of fibre-optic are ISK [...].

Hosting and electricity

Míla allows for hosting of equipment and costs for electricity consumption. Míla reckons that equipment of the type [...] takes about [...] of 1 shelf unit while equipment of the type [...] takes [...] of a shelf unit. Given these criteria, the total cost of hosting is ISK [...].

Míla reckons that energy consumption for equipment of the type [...] is [...] W and [...] W for equipment of the type [...]. Total electricity cost is therefore ISK [...] per annum.

Service agreements

Míla states that service agreements have been made about the equipment. The share of service agreements in the total agreement with service parties uses the same criteria as in the analysis from 2014. Míla uses the average Euro exchange rate in 2016.

Other costs

Míla uses the same proportion of opex of the annuity and of Ethernet service outside the Fibre-optic Ring, see Section 4.1.1 here above. According to the above, other opex amounts to ISK [...].

5.1.2 The position of the PTA

The PTA has scrutinised Míla opex for Ethernet service on the Fibre-optic Ring. It is stated in the Míla cost analysis that opex for the system is divided into lease of fibre-optic, hosting and electricity, service agreements for equipment and other opex, such as share in NOC, common costs and general maintenance costs. This is in accordance with that shown in the last Míla analysis for this product.

Fibre-optic rental

As stated by Míla, the fibre-optic is by far the largest cost item in this system.

The fibre-optic lease is based on the tariff for a fibre-optic pair in the countryside: A discount of 15% is allowed for. The PTA has examined the cable routes used to calculate fibre-optic lease and raises no objections to them. Annual costs are estimated at about ISK [...] million on the Fibre-optic Ring.

Hosting, electricity and service agreements

Hosting is calculated on the basis of the tariff for hosting in facilities. The cost for hosting is calculated on the basis of the dimensions of the equipment used at each location.

Electricity cost is calculated from the estimated energy consumption of the equipment used to provide this service and from the Míla tariff.

Annual costs for hosting and electricity are estimated at about ISK [...] million.

Costs for service agreement are about ISK [...] million per annum. These costs are calculated from costs of the agreement in EUR, converted to ISK.

Other opex

Míla estimates these costs on the basis of a proportion of analogous costs in the Míla cost analysis for leased lines. The same methodology is used as in the last cost analysis, but costs increase significantly because of the higher proportion of opex against annuity which is because annuity on equipment has decreased at the same time as total opex has increased. The conclusion is that the share of Ethernet on the Fibre-optic Ring in common opex for leased lines is estimated at ISK [...] million per annum.

Total opex

According to the above, annual Míla opex for Ethernet service at locations on the Fibre-optic Ring is estimated at ISK [...] million which is about ISK [...] million per location. By comparison, opex in the last cost analysis was about ISK [...] million or about ISK [...] million per location and the average opex for each location has decreased since the last cost analysis. By far the largest cost item is, as before, lease of fibre-optic between locations. Although locations on the Fibre-optic Ring have increased from 17 to 22, the total length of leased fibre-optic has not increased significantly, by about 4%, which explains to some degree that opex at each location has decreased on average.

The PTA raises no objections to the methodology used by Míla for calculating opex.

5.2 Investment costs

5.2.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017 the following is stated on Míla capex for Ethernet service outside the Fibre-optic Ring.

"The calculation of investment base is calculated in the same way as investment base for Ethernet service outside the Fibre-optic Ring.

Useful life of equipment is assessed at 8 years and in the 2014 analysis this was evaluated at 6.67 years. Míla considers that significant experience has now been gained of the equipment and that it can last for 8 years and for this reason useful life is extended to 8 years.

Investment base is ISK [...] and the annuity on the investments is ISK [...]."

5.2.2 The position of the PTA

The PTA has examined data from Míla bookkeeping and makes no objections to the capex specified by Míla for the locations where equipment has been installed.

The total investment in equipment and its installation at locations on the Fibre-optic Ring is ISK [...] million which is an average of ISK [...] million per location. The total investment in

equipment in the last analysis at locations on the Fibre-optic Ring was about ISK [...] million and the average investment for each location was about ISK [...] million. That analysis used estimates for capex at Blönduós, Dalvík, Kirkjubæjarklaustur and Breiðholt but it has now come to light that the real costs were lower, which explains among other things the lower average capex at each location.

The average investment for each location on the Fibre-optic Ring is higher than for locations outside the Fibre-optic Ring as Míla is investing in less expensive and lower capacity equipment outside the Fibre-optic Ring.

In the cost analysis Míla requests an amendment to the useful life of MPLS-TP equipment from 6.67 to 8 years. Míla bases this on experience gained of the equipment. It is generally not desirable to change calculated useful life during the lifetime of Investments as this could distort calculations and recovery of capex. There are however precedents for this, such as useful life of fibre-optic. The PTA endorses this amended lifetime, particularly in the light of the fact that revenue from this service is deducted from costs in the cost analysis for leased lines, which means that this is only a division of costs between Míla service items.

Given an 8 year useful life and 7.0% WACC for 2016 then the annuity on investments for Ethernet service on the Fibre-optic Ring is approximately ISK [...] million.

5.3 Line equivalent

5.3.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017, the following is stated about line equivalents for Ethernet service on the Fibre-optic Ring.

"Number of lines in March 2017 was as follows:

[...]

Line equivalents are calculated with the same methodology as in the current tariff. The number of line equivalents is [...]. As growth of the service is much slower than outside the Fibre-optic Ring, Míla considers there to be no need to allow for an increase in connections in calculations of the lease price."

5.3.2 The position of the PTA

Míla uses the same exponent 0.4 in calculating the coefficient for data transfer volume as was the case in the last cost analysis. In addition, the same price categories are used as the previous analysis.

The PTA makes no objections to Míla calculations and conclusion on line equivalents. Line equivalents for locations outside the Fibre-optic Ring are estimated at [...] compared to [...] in the last analysis, which means an increase of only about [...]%.

5.4 Total costs and calculation of unit prices

Total costs per annum comprise estimated opex for the year 2016 and annuity on Míla investments until the year 2016. The figures are based on the Míla cost analysis received by the Administration on 26 January 2018.

Opex is calculated from costs for renting fibre-optic between locations, for hosting and electricity and for service agreements for equipment. The service also takes a share of common opex in the Míla trunk line system.

Annuity on investments is calculated from the investment base which is comprised of investments Míla has made for developing the MPLS-TP system on the Fibre-optic Ring.

The quantities of sold units are based on the status in March 2017.

5.4.1 Míla cost analysis

In the Míla cost analysis which was revised on 26 January 2018, it is stated that the annuity on investments is ISK [...].

In the cost analysis there is also the following table with an overview of opex:

Opex	
Fibre-optic rental.....	[...]
Service agreements.....	[...]
Hosting and electricity.....	[...]
Other costs.....	[...]
	[...]

Total cost according to Míla are thus ISK [...].

Total costs less the estimated revenue from ports amount to ISK [...].

The unit price for 100 Mb/s on the Fibre-optic Ring is therefore ISK 51,983 according to Míla calculations and the increase thus about 1.2% from the existing tariff.

5.4.2 The position of the PTA

The Míla conclusion on tariff for Ethernet service is broadly based on the methodology prescribed by the PTA with respect to other services.

The conclusion of the cost analysis is that total cost of the Ethernet service for locations on the Fibre-optic Ring is ISK [...] million. It is estimated that this cost will be recovered with monthly charges for ports, total ISK [...] million per annum and with monthly charges for connections, total ISK [...] million per annum.

When calculating monthly charges for connections, [...] line equivalents are used which means that the monthly price for a base connection is ISK 51,983.

The tariff for Ethernet service for locations on the Fibre-optic Ring will thus be:

Data transfer speed (Mb/s)	Monthly price (ISK)		
	0-49 km	50-99 km	100+ km
100	51,983	77,975	103,967
200	68,592	102,889	137,185
300	80,670	121,005	161,340
400	90,508	135,762	181,016
500	98,958	148,437	197,916
600	106,445	159,667	212,890
700	113,215	169,822	226,429
800	119,426	179,139	238,852
900	125,187	187,781	250,375
1000	130,576	195,864	261,152
2000	172,296	258,444	344,592
3000	202,634	303,951	405,268
4000	227,346	341,019	454,692
5000	248,572	372,858	497,144
6000	267,377	401,066	534,754
7000	284,383	426,574	568,765
8000	299,985	449,978	599,970
9000	314,457	471,685	628,913
10000	327,992	491,989	655,985

The above prices are on the basis of guaranteed bandwidth. The price for over-booking will be 10% of the tariff for guaranteed bandwidth.

The setup charge for Ethernet service remains unchanged at ISK 96,000.

Compared with the current tariff this is then a reduction of 1.2%.

6 Sync – Ethernet

6.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017, the following is stated on Sync-Ethernet:

"*Sync-Ethernet is a service that can be provided through ports in the Míla Ethernet service. The MPLS-TP equipment on which Ethernet service is based gives good opportunities to provide customers with access to clock signal through MPLS-TP equipment ports. In this way the customer can synchronise his equipment with his system.*

To be able to provide this service, an atomic clock needs to be in place and today there are such clocks located at Múli and Breiðholt. From there it is possible to carry the tick through

the MPLS-TP system. This possibility is incorporated into the manufacturer's equipment which means that this functionality carries no external cost.

Investment

Central equipment. Siminn renewed the equipment in Múli when the trunk line network was controlled by Siminn for a period of time. For this reason, Míla does not have precise information on the size of the investment and considers there to be no need to gather this information for the time being as those costs will not be calculated into the lease price in this analysis. Míla considers it necessary to gain experience of this service before the investment is calculated into the model.

Other equipment is built into Míla MPLS-TP equipment and is therefore included in the cost analysis of Ethernet service.

Installation cost

The service has to be activated in the equipment and recorded in the line bookkeeping. Míla allows for [...] minutes for each process, which is a total of [...] minutes. The annuity on the basis of 10 years is ISK [...] per connection, which is [...] per month.

Opex

Míla estimates opex are about [...] hours per annum, with the addition of [...] hours at [...] years intervals to meet costs if problems arise. This totals [...] per annum, on average. Given ISK [...] hourly rate (billed hours according to rate), annual cost is ISK [...].

Number of connections

Míla allows for about [...] ports being activated for this service ([...] during the next 2 to 3 years).''

In an e-mail dated 17 November 2007, the PTA requested a correction on Míla calculations of the monthly rate for Sync-Ethernet. A reply from Míla on the same day contained a correction of Míla calculations of the monthly rate for Sync-Ethernet. It was stated there that the conclusion on the basis of the given criteria was that the monthly rate for Sync-Ethernet was ISK 313.

6.2 The position of the PTA

The PTA has reviewed the Míla criteria for the Sync-Ethernet service and raises no objections to the criteria used by Míla. This is a new service for Míla which means that this is an estimate of the number of hours used in installation and operation of the service. The PTA raises no objections to the hourly rate used by Míla when one considers the description of the task as specified in the Míla criteria.

The conclusion is that the monthly rate for Sync-Ethernet will be ISK 313.

7 Cost analysis of Metropolitan Data Highway (MDH)

7.1 Opex

7.1.1 Míla cost analysis

In the Míla cost analysis it was stated that a large part of the costs for MDH are in the form of common costs in trunk line network opex. For this reason, it is necessary to estimate maintenance costs in another manner than by using booked costs. Other opex includes hosting in technical spaces, electricity and fibre-optic.

According to Míla calculations in the revised Míla cost analysis dated 26 January 2018, opex is as follows:

Opex	
Fibre-optic.....	[...]
Hosting.....	[...]
Other costs.....	[...]
	[...]

It was stated by Míla that most high-speed connections also use fibre-optic in the Access network. As the MDH system is structured such that fibre-optic is assumed in the Access network for MDH connections, the lease of 1 thread is added to the final calculations.

The calculation of opex is the same as in the previous analysis.

Fibre-optic rental

In Míla calculations, all fibre-optic in the trunk line network that is used for MDH is categorised under common costs for 1 Gb/s and 10 Gb/s connections as they constitute the base layer for the service.

Míla states that as this is leasing of fibre-optic within the same operational unit, there is no separate transfer made for this in the bookkeeping, but when calculating the price of the product, one must include this leased line cost. Development of fibre-optic routes has changed slightly from the previous analysis as a number of routes have been decommissioned in the interests of efficiency.

The Míla conclusion is that the lease price per month for the underlying fibre-optic lines for the MDH system is [...] per annum. The unit price for fibre-optic is based on the calculated lease price according to the revised cost analysis dated 26 February 2018.

When dividing costs for fibre-optic, Míla takes into account the fact that fibre-optic lines are used equally for these connections and it makes no difference whether the connection is 1 Gb/s or 10 Gb/s. It is stated in the cost analysis, that there are currently [...] 10 Gb/s, [...] 1 Gb/s and [...] 100 Gb/s connections being leased. [...] Lease of fibre-optic is divided in the same proportions as the estimated number at each speed.

In the calculations it is assumed that each connection will have one fibre-optic thread in the Access network and that this is added to the calculation at the end.

Hosting

Míla calculates hosting costs on the basis of the tariff for hosting. Míla states that internal lease in all technical spaces is calculated, except in Sandgerði and Garðabær where equipment that occupies little space is installed in cabinets with other trunk line network equipment and those lease costs are booked on other cost units for the trunk line network.

Míla points out that it is difficult to evaluate how one should divide costs for lease of fibre-optic between 1 Gb/s and 10 Gb/s. Lease of space is used equally for these connections and in addition to this there is the fact that central equipment uses a large part of the space. Míla therefore considers that this cost should be divided in the same proportion as the cost for fibre-optic, see section here above.

The Míla conclusion is that hosting costs total ISK [...].

Other costs

It is stated in the Míla cost analysis that maintenance costs are estimated as [...]% of annuity on investments. This proportion was [...]% in the 2015 analysis, which means that the cost is now proportionately higher. As stated in the discussion on Ethernet service, the comparable proportion is [...] which is considerably higher. The reason for the proportion being lower for MDH is that the MDH system is located in the Capital City Area and for this reason, much more economical in operation than systems in the countryside. In addition to this, the equipment is less complex as part of the system comprises inactive light filters and the equipment has proven operationally stable. This means that costs for maintenance and repairs have remained at a minimum in the MDH system.

According to the above, other opex amounts to ISK [...].

7.1.2 The position of the PTA

The PTA has scrutinised Míla opex for MDH and has compared it with the previous cost analysis for this service[4]. According to the Míla analysis, opex is estimated at ISK [...] million compared to ISK [...] million in the previous cost analysis. The main difference is in the cost of fibre-optic lease, which has decreased.

The PTA raises no objections to Míla ’s estimated opex for MDH.

[4] Decision no. 32/2015 on review of Mila wholesale tariff for MDH connections on the market for trunk segments of leased lines.

7.2 Investment costs

7.2.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017, it was stated that investment base was calculated in the same manner as in the cost analysis which was sent to the PTA in 2015 where the gross replacement cost of equipment had been used.

The same cost price for equipment is used now in this analysis, as Míla has not invested in MDH equipment with the exception of equipment installed at Reykjanes to provide 100 Gb/s data transfer rate. As the exchange rate of the ISK has increased significantly, the cost of materials is converted from the average exchange rate of the Euro for each year to the average exchange rate in 2016, ISK 133.96.

In an e-mail dated 15 November 2018, the PTA pointed out that Míla had revised the investment base (which was reassessed in 2015) on the basis of the average exchange rate of 2016, while the labour component remained unchanged. In the opinion of the PTA, it would be normal for the labour component (installation) to be revised on the basis of the wage index for the sake of consistency when this methodology is used.

On 16 November 2018, Míla submitted a revised model for cost analysis for MDH in accordance with PTA comments, with the following table which shows calculations of the investment:

	Shared	100 G	10 G	1 G	Total
Materials costs					
2010.....	[...]	[...]	[...]	[...]	[...]
2011.....	[...]	[...]	[...]	[...]	[...]
2012.....	[...]	[...]	[...]	[...]	[...]
2013.....	[...]	[...]	[...]	[...]	[...]
Sept. 2012- June 2013	[...]	[...]	[...]	[...]	[...]
2014.....	[...]	[...]	[...]	[...]	[...]
2015.....	[...]	[...]	[...]	[...]	[...]
2016.....	[...]	[...]	[...]	[...]	[...]
	[...]		[...]	[...]	[...]
		[...]	[...]	[...]	[...]
Labour component					
2010.....		[...]	[...]	[...]	[...]
2011.....		[...]	[...]	[...]	[...]
2012.....	[...]	[...]	[...]	[...]	[...]
2013.....	[...]	[...]	[...]	[...]	[...]
Sept. 2012- June 2013	[...]	[...]	[...]	[...]	[...]
2014.....	[...]	[...]	[...]	[...]	[...]
2015.....	[...]	[...]	[...]	[...]	[...]
2016.....	[...]	[...]	[...]	[...]	[...]
	[...]	[...]	[...]	[...]	[...]
		[...]	[...]	[...]	[...]
		[...]	**[...]**	**[...]**	**[...]**

In the Míla cost analysis it is stated that when the division of investment was made between 1 Gb/s high-speed and 10 Gb/s MDH, the equipment was categorised. Shelves, shells and other central equipment was categorised as shared equipment. Equipment that was specifically for 10 Gb/s connections was allocated directly to 10 Gb/s and equipment for 1 Gb/s connections was allocated directly to 1 Gb/s.

Shared equipment comprised mainly filters, shelves and shells and other materials costs.

The number of leased MDH for each data transfer rate (10 Gb/s and 1 Gb/s) is taken into account in the division of shared costs. Common costs only relate to connections with 10 Gb/s and 1 Gb/s data transfer rate.

In December 2016 there were [...] 10 Gb/s connections being leased and [...] 1 Gb/s connections. This means that [...]% shared costs were allocated to 10 Gb/s and [...]% to 1 Gb/s.

It was then stated by Míla that the company did not have information on a breakdown of investments for the period when MDH operations were handled by Siminn. For this reason, the same division between 10 Gb/s and 1 Gb/s is used as in the previous analysis and it is assumed that capex for material had decreased by about [...]% because of a reduction in unit prices.

Capex in 2016 was solely for 100 Gb/s at Reykjanes.

According to the revised Míla analysis the total investment base was ISK [...].

7.2.2 The position of the PTA

The PTA has scrutinised Míla capex for MDH. As stated here above, the gross replacement cost of equipment from the last cost analysis is used, having taken into account changes in the exchange rate between the years. The labour component is also revised on the basis of the wages index. This methodology for updating capex is in accordance with that which was previously endorsed by the PTA, see PTA Decision no. 6/2017 on review of Míla wholesale tariff for bitstream access. The PTA raises no objections to this Míla approach for adjusting the capex.

Total investment base pursuant to the above therefore amounts to about ISK [...] million.

7.3 Number of lines

7.3.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017, the following is stated with regards to Míla calculation of number of lines for MDH:

"The table here below shows the number of lines in December 2016 on the one hand and the estimated number in the cost calculations on the other:

	Dec. 16	Estimated number
1 Gb/s.....	[...]	[...]
10 Gb/s.....	[...]	[...]
100 Gb/s.....	[...]	[...]

The calculations allow for an increase in 1 Gb/s of about [...]. As the situation is today, the price difference between 1 Gb/s and 10 Gb/s is too small, which means that companies will rather take 10 Gb/s than 1 Gb/s or look for another, more economical way to resolve their data transfer needs.

It is projected that 10 Gb/s will increase by about [...].

MDH with 100 Gb/s data transfer rate are now only on offer from the Capital City Area to Verne via Thor. [...]"

7.3.2 The position of the PTA

From 15 November 2017 until 16 January 2018, the PTA and Míla exchanged emails regarding Míla plans for the number of sold 1 Gb/s MDH, which lead to considerable reduction of monthly charges for this product. It was stated by Míla that MDH is different from other services as

costs for this product were to a very large extent fixed costs. This means that the price, which is based on cost, is very sensitive to the amount sold. At meetings with customers, it became very clear that they consider that the price for 1Gb/s MDH is far too high compared to other options and there was a drop in the number of 1Gb/s MDH last year. [...]. Míla furthermore considers it to be clear that demand for this product is considerable and is increasing steadily, [...]. It was stated by Míla that the price of the equipment used for MDH had been falling [...].

Míla estimates that 1 Gb/s MDH will increase by about [...] which is a proportionately large increase. For this reason, the PTA believes that the underlying criteria must be examined carefully. The PTA accepted the Míla view that in the light of Míla fixed costs for MDH being so proportionately high that it is possible to increase the number of connections without a significant increase in total cost. This means that estimating a significant increase in the number of sold MDH does not breach the condition that the prices should be based on costs if the Míla projection on demand is realised. [...]. Míla considers that, given this demand, the company can sell [...] 1 Gb/s MDH as the price will no longer be an obstacle. Given what has been said by Míla, the PTA can accept that the Míla projection on increase in the number of 1 Gb/s MDH is realistic.

With respect to 10 Gb/s MDH, Míla expects them to increase by about [...] which the PTA considers to be in step with recent developments.

In the light of what has been said here above, the PTA does not object to using the Míla projection on increase of MDH when calculating the price for MDH as this is a forward-looking approach to pricing of the service. According to this, calculations of price for MDH allow for there being [...] 1 Gb/s and 10 Gb/s MDH and [...] 100 Gb/s MDH.

7.4 Total costs and calculation of unit prices

7.4.1 Míla cost analysis

The following table, which shows conclusions of calculations and according to the above specified criteria, can be found in the revised Míla cost analysis dated 26 January 2018.

	100 Gb/s	10 Gb/s	1 Gb/s
Capex.....	[...]	[...]	[...]
Setup charge.....	[...]	[...]	[...]
	[...]	[...]	[...]
Lifetime	[...]	[...]	[...]
WACC	[...]	[...]	[...]
Annuity on investments.....	[...]	[...]	[...]
Fibre-optic lease.....	[...]	[...]	[...]
Rent for premises.....	[...]	[...]	[...]
Other costs.....	[...]	[...]	[...]
	[...]	[...]	[...]
Number of lines.....	[...]	[...]	[...]
Lease price per annum	[...]	[...]	[...]
Lease price per month.....	[...]	[...]	[...]
Fibre-optic-optic in access network.....		[...]	[...]
	409,026	***105,830***	***63,791***

Míla points out that this is a significant price reduction as is seen in the following table:

	Current tariff	New tariff	Change
1 Gb/s.....	95,000	63,791	-33%
10 Gb/s.....	120,000	105,830	-12%
100 Gb/s.....	655,000	409,026	-38%

Míla states that the company considers that these price reductions create the conditions for increased demand for this service, and in this way the estimated increase will be achieved with resulting economies.

7.4.2 The position of the PTA

The Míla criteria and calculations here under discussion with respect to the review of the wholesale prices for 1, 10 and 100 Gb/s MDH connections are in the opinion of the PTA in accordance with the obligation on the company for price control, see the PTA Decision no. 21/2015.

The PTA has examined the Míla criteria and calculations and in addition to this Míla has in its replies to PTA queries, explained the criteria and calculations in more detail on which the company based its cost analysis. The PTA raises no objections to the conclusion of the Míla calculations, according to the company's revised cost analysis from 26 January 2018.

The tariff will thus be as follows:

- Price for 1 Gb/s connection 63,791 per month.
- Price for 10 Gb/s connection 105,830 per month.
- Price for 100 Gb/s connection 409,026 per month.
- Setup charge ISK 107,000 per connection.

8 Leased lines in trunk line network

In the Míla cost analysis dated 9 June 2017, the following is stated with respect to leased lines in the trunk line network:

"By far the largest part of trunk line network revenue comes from traditional leased lines, i.e. leased lines that have been offered for decades. Revenue from Ethernet service has been increasing and against this, revenue from traditional leased lines has been decreasing. [...].

In 2015, Míla participated in a call for tenders for laying a fibre-optic cable from Staður in Hrútafjörður to Hólmavík. On 30.10.2015, Míla requested a permission to incorporate a tariff for service on this route in the Míla tariff. With a letter dated 11 November 2015, the PTA acceded to the Míla request. Míla assumes that the tariff for this route will continue to be part of the general Míla tariff. The route from Staður to Hólmavík is only part of the route to the West Fjords and therefore unlikely that customers will wish to lease this route on its own. It is therefore not practical to separate this route from the general Míla tariff, as the fixed charge is relatively high. If it were necessary to prepare a separate tariff, the customer would need to lease two connections instead of one with the consequential inconvenience, both with regards to technical implementation and price. Míla therefore includes the cost of this line in the calculations for a leased line (and Ethernet service).

The cost model for leased lines is in the main based on calculations in previous analyses."

8.1 Opex

8.1.1 Míla cost analysis

The following table is in the revised Míla cost analysis dated 7 February 2018 and it shows opex for 2016 and the comparison with a 12-month period, June to December 2013 and January to April 2014 (on which the last cost analysis was based):

	2016	6-12 2013 and 1-5 2014	Change	In %
Fibre-optic.....	[...]	[...]	[...]	[...]
Equipment.....	[...]	[...]	[...]	[...]
Microwaves.....	[...]	[...]	[...]	[...]
Connections.....	[...]	[...]	[...]	[...]
Control network.....	[...]	[...]	[...]	[...]
Senior management and support department costs.....	[...]	[...]	[...]	[...]
	[...]	**[...]**	**[...]**	**[...]**

Míla points out that opex increases significantly less than the consumer price index, which increased by about 3.3% for the same period. Senior management costs have dropped by about [...]% while there has been an increase in price for fibre-optic and equipment of about [...]%.

- There are several explanations for the decrease in senior management costs: [...]

Against this reduction in senior management costs, transferred labour increased by about ISK [...] million. One could therefore say that costs for Míla staff working on trunk line network have increased by about ISK [...] million, which is just under [...]%. At the same time the wages index increased by about [...]%.

The following table is in the Míla analysis which shows how opex is divided:

	2016	6-12 2013 og 1-5 2014	Change
Cost price of sold services.....	[...]	[...]	[...]
Office and management costs.....	[...]	[...]	[...]
Sales and marketing costs.....	[...]	[...]	[...]
Housing costs.....	[...]	[...]	[...]
Access to distribution 48 V.....	[...]	[...]	[...]
Internal work and transport.....	[...]	[...]	[...]
Hosting.....	[...]	[...]	[...]
Senior management and support departments.....	[...]	[...]	[...]
Other costs……..	[...]	[...]	[...]
	[...]	[...]	[...]

Míla points out that access to 48 Volts is ISK [...] million higher in 2016 than in the comparison period. [...].

Office and management costs were lower by about ISK [...] million, which can be directly attributed to the fact that in the previous period, Skipti handled bookkeeping and other office costs. Subsequent to the new Settlement with the Competition Authority, Míla has taken over these operations which can to some extent be traced to higher transferred work.

Hosting increases by about ISK [...] million. The explanation of the reduction is in two parts, [...].

Additionally, it was stated by Míla that the company expected opex to decrease considerably in the coming years. New equipment is easier to operate and it requires less space and electricity. It is now expected that both opex and hosting costs will decrease. Míla assumes that costs for operating SDH equipment will decrease by about ISK [...] million per annum and that the cost for operating microwave connections will decrease by about ISK [...] million per annum. Allowance is made in this cost model for this decrease in costs.

According to the above, opex is as follows:

	Opex 2016	Cost reduction	Opex for calculation
Fibre-optic.....	[...]		[...]
Equipment.....	[...]	[...]	[...]
Microwaves.....	[...]	[...]	[...]
Connections.....	[...]		[...]
Control network.....	[...]		[...]
Senior management and support department costs...	[...]		[...]
	[...]	[...]	[...]

8.1.2 The position of the PTA

Opex is based on Míla 's real costs for the trunk line network for 2016. Míla however allows for a reduction in opex because of new equipment which is less expensive to run. In this manner, future prospects in operations are also taken into consideration in the light of new equipment. With the new Míla MPLS-TP service, Míla has invested in equipment which can be used both for Míla Ethernet service and also for Míla's traditional SDH leased lines.

Having taken into account a deduction for new equipment, annual opex is estimated at ISK [...] million compared with ISK [...] million annual costs in the last analysis. This means that there is a reduction of calculated opex.

8.2 Investment costs

8.2.1 Míla cost analysis

In the Míla cost analysis it is stated that the investment base is adjusted in the same manner as in previous analyses. The useful life of fibre-optic was 25 years but has now been lengthened to 35 years in accordance with PTA recommendation to this effect in an email dated 11 January 2017.

According to Míla calculations in the revised cost analysis dated 7 February 2018, the investment base is as follows:

	Invest. base	Corrected invest. base	Annuity
Fibre-optic……	[...]	[...]	[...]
Equipment.....	[...]	[...]	[...]
MPLS-TP…….	[...]	[...]	[...]
Control network.....	[...]	[...]	[...]
Microwaves.....	[...]	[...]	[...]
MDH.....	[...]	[...]	[...]
Measuring equipment...	[...]	[...]	[...]
	[...]	[...]	[...]

Adjusted investment base is according to this ISK [...].

In the Míla reply dated 16 November 2017 to a PTA query, it was also stated that Míla had received a grant of ISK 67,814,608 from the Telecommunications Fund for Phase I in the West Fjords. The investment base for this construction was ISK [...] and Míla's share was ISK [...]. The contribution of the Telecommunications Fund is not included in the investment base.

Míla also stated in the cost analysis that the adjusted investment base is reduced in accordance with the calculated investment base for MDH to the amount of ISK [...], see Section 7 here above.

In the revised Míla analysis dated 7 February 2018, capex for equipment is divided in such a manner that MPLS-TP equipment has a different useful life period. The annuity on investment according to the conclusions of the analysis is ISK [...].

8.2.2 The position of the PTA

The PTA has compared Míla investments with the last cost analysis. The PTA particularly examined the years 2014, 2015 and 2016, which have been added since the last analysis. For the sake of comparison, the PTA also has data on separation of accountancy which Míla provided for these years. In the PTA Decision no. 20/2017 on review of the Míla wholesale tariff for fibre-optic in street cabinets (Market 4/2008) and fibre-optic in access network (Market 6/2008), the useful life of fibre-optic was reviewed.

The useful life was changed to 35 years. For reference, the PTA examined useful life in cost models from Norway, Sweden and Denmark. In Norway and Sweden, a 20 year useful life is used for fibre-optic cables and 40 year useful life for trenches/conduits. Frontier Economics also used this useful life in a model used in Luxembourg. The Danish national regulatory authority on the other hand, used 35 year useful life for fibre-optic cable, trenches and conduits. If one calculates a mixed useful life, on the basis of 20 year useful life for fibre-optic cable and 40 year useful life for trenches/cable routes on the basis of the investment being divided 25% for fibre-optic cables and 75% for trenches/cable routes then this results in a 35 year mixed useful life for fibre-optic, the same as used by the Danish authority.

With this change, the investment base of fibre-optic changes significantly and becomes about ISK [...] billion against ISK [...] billion in the last analysis, but against this there is the fact that the annuity is calculated on the basis of a longer useful life.

The total length of the Míla fibre-optic system, on which the trunk line system is based, is [...] km. Given this figure the capex for each kilometre is on average about ISK [...] million. This amount is within the range that the PTA considers normal, given the information that the PTA has on average cost of laying fibre-optic, both from Míla and from other parties. The PTA

considers in the light of the above that the investment base used as a reference in the cost analysis is realistic and credible.

In an email from the PTA dated 11 January 2018, the PTA requested a correction of Míla calculations of annuities on equipment in the light of the fact that a different useful life period was used for MTPLS-TP equipment than for other equipment in the trunk line network. In the revised Míla cost analysis dated 26 January 2018, this was corrected.

In the light of the above the PTA makes no objections to the Míla investment costs.

8.3 Line equivalent

In the PTA Decision no. 14/2011 on Míla cost analysis of the tariff for leased lines, it was decided to define a specific lease unit (line equivalent) and its cost and to calculate other sizes of leased lines as a multiple of the base unit. It was decided to use a 2 Mb/s leased line as a base unit.

The equation here below was used to calculate the price for kilometre and fixed charge for trunk lines according to a given exponent and the price for the base speed (2 Mb/s) used as a reference (h = data transfer speed).

$$\mathbf{Price}_{\mathbf{h}\ Mb/s} = \mathbf{Price}_{\mathbf{2}\ Mb/s} \times \left(\frac{\mathbf{h\ Mb/s}}{\mathbf{2\ Mb/s}}\right)^{exponent}$$

The exponent 0.45 was used for the lower data transfer speed and 0.35 for data transfer speeds in excess of 100 Mb/s.

In this cost analysis, Míla uses an unchanged coefficient for calculating line equivalents.

8.3.1 Míla cost analysis

In the Míla cost analysis dated 9 June 2017 the following is stated with respect to line equivalents of leased lines:

"The quantity of line equivalents is calculated in the same manner as in previous analyses. The only change that has been made from prior calculations is that the weighting of fibre-optic is increased from [...] Mb/s equivalents.

The reason for this change is that Míla considers that care has to be taken not to distort the proportion between fibre-optic and the kilometre price for connections. The proportion of fibre-optic and kilometre price for 2 Mb/s connections in the analysis sent to the PTA in 2009 was 13.94. In the current tariff it is 14.01 and in the current calculations it is now 13.76.

Míla furthermore considers it normal to increase the coefficient as fibre-optic is scarce and data transfer speed of connections has increased greatly. Fibre-optic can carry almost infinite data transfer speeds. The only limitation to this is the equipment. Since the last analysis was

made, data transfer quantity has increased enormously and for this reason Míla considers it necessary to review the coefficient.

Míla sells a number of connections to Access systems and they are included in the analysis.

When calculating line equivalents, discount terms for customers are taken into account and this means that the quantity is on the basis of discounts given in December 2016.

The number of equivalent lines is [...] and the number of equivalent kilometres is [...].”

8.3.2 The position of the PTA

As stated by Míla, the same methods are used now for calculating line equivalents as in the last cost analysis, with the exception of the increase in the weighting of fibre-optic. The PTA raises no objections to the increased weighting of fibre-optic in the light of the development of data transfer speed. The conclusion is therefore that the number of line equivalents is [...] and the number of kilometre equivalences [...].

The number of traditional leased line connections has been on the decrease. At the same time. MPLS-TP connections have increased. 2 Mb/s leased line connections are the most common and provide [...]% of revenue for monthly charges of leased lines.

8.4 Total costs and calculation of unit prices

8.4.1 Míla cost analysis

The following table is in the Míla cost analysis, which shows total costs for calculation of lease price for leased lines and fibre-optic in the trunk line network.

	Opex	Annuity	Total	Senior management	Total	Other revenue	For calculation
Fibre-optic…….	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Equipment.....	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Control network.....	[...]	[...]	[...]	[...]	[...]		[...]
Microwaves.....	[...]	[...]	[...]	[...]	[...]		[...]
Connections.....	[...]	[...]	[...]	[...]	[...]		[...]
	[...]	[...]	[...]	[...]	[...]	[...]	[...]

Opex is ISK [...] not counting senior management costs. Míla divides senior management costs in the same proportion as the total opex and annuity. Total trunk line network costs, according to the Míla cost analysis amounted to ISK [...].

Míla states that the trunk line network is comprised of leased lines, Ethernet service and MDH. In addition to this the trunk line network has revenue from cross connect, setup charges, agreement with [...], and from other smaller operational agreements. To find a specific cost base

for calculation of lease lines one would need to deduct this revenue from the total opex of the trunk line network.

Revenue for deduction is as follows:

	Equipment	Fibre-optic	Total
Ethernet service.....	[...]	[...]	[...]
MDH.....	[...]	[...]	[...]
Other.....	[...]	[...]	[...]
[...]	[...]	[...]	[...]
[...]	[...]	[...]	[...]
Setup charges.....	[...]	[...]	[...]
	[...]	[...]	[...]

Income from MDH and Ethernet service is based on a cost model for those products. As calculations of Ethernet service outside the Fibre-optic Ring and MDH allow for an increase, the deduction is higher than real revenue from the service in question. For this reason, Míla does not allow for an increase in cost in step with the increase in connections.

Míla also states that revenue from [...] million in 2016. [...].

Revenue from the agreement with [...] is deducted from costs for equipment.

Setup costs are ISK [...] million and they are deducted from equipment.

Other revenue is ISK [...] million of which about ISK [...] million is for operation agreements for equipment with [...]. Revenue from TV equipment amounts to ISK [...] million and revenue from temporary connections is ISK [...] and revenue from cross connect and multiplexing is ISK [...] million.

The conclusion of the calculations is as follows:

	Total costs	% of connect.	Costs For connect.	Costs for roadworks	Number of lines	Number of km	Price per line	Price per km
Fibre-optic...	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Equipment.....	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Control network	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Microwaves.....	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Connections.....	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
	[...]		[...]	[...]			[...]	[...]
						Per month	**[...]**	**[...]**
						Price equivalent fibre-optic per month		**[...]**

Proportion of connections in calculations decreases slightly from previous analysis. The proportion is calculated using the same methodology as in previous analysis.

Conclusion of Míla calculations is that the price per line increases by about 14% while price related to distance decreases by about 2%. Price for fibre-optic decreases by about 1 to 2%.

The following table shows a new tariff. According to conclusions of calculations and comparison with current tariff:

	Current tariff		New tariff		Change	
	per line	per km	per line	per km	per line	per km
64 kb/s.....	2,911	114	3,331	112	14%	-2%
64 kb/s protected connection...	4,366	171	4,996	168	14%	-2%
128 kb/s.....	3,976	156	4,550	153	14%	-2%
128 kb/s, protected connection.	5,964	234	6,825	230	14%	-2%
256 kb/s.....	5,432	213	6,215	209	14%	-2%
256 kb/s protected connection.	8,147	320	9,323	314	14%	-2%
512 kb/s.....	7,420	291	8,491	286	14%	-2%
512 kb/s protected connection...	11,130	437	12,736	428	14%	-2%
2 Mb/s.....	13,699	538	15,676	527	14%	-2%
2 Mb/s protected connection...	17,124	672	19,595	659	14%	-2%
2 Mb/s interconnection current...	6,849	538	7,838	527	14%	-2%
45 Mb/s.....	40,733	1,599	46,611	1,568	14%	-2%
45 Mb/s protected connection...	61,100	2,399	69,917	2,352	14%	-2%
155 Mb/s.....	57,565	2,260	65,872	2,216	14%	-2%
622 Mb/s.....	91,053	3,575	104,193	3,505	14%	-2%
2.5 Gb/s.....	339,04	13,313	388,005	13,051	14%	-2%
Ethernet 2 Mb/s.....	13,699	538	15,676	527	14%	-2%
Ethernet 4 Mb/s.....	18,713	735	21,414	720	14%	-2%
Ethernet 6 Mb/s.....	22,459	882	25,700	864	14%	-2%
Ethernet 10 Mb/s.....	28,263	1,110	32,342	1,088	14%	-2%
Ethernet 20 Mb/s.....	30,668	1,204	35,094	1,180	14%	-2%
Ethernet 26 Mb/s.....	33,617	1,320	38,469	1,294	14%	-2%
Ethernet 28 Mb/s.....	34,501	1,355	39,480	1,328	14%	-2%
Ethernet 30 Mb/s.....	35,344	1,388	40,445	1,360	14%	-2%
Ethernet 40 Mb/s.....	39,088	1,535	44,729	1,504	14%	-2%
Ethernet 46 Mb/s.....	41,048	1,612	46,971	1,580	14%	-2%
Ethernet 48 Mb/s.....	41,664	1,636	47,676	1,604	14%	-2%
Ethernet 50 Mb/s.....	42,263	1,659	48,362	1,627	14%	-2%
Ethernet 60 Mb/s.....	45,048	1,769	51,549	1,734	14%	-2%
Ethernet 80 Mb/s.....	49,820	1,956	57,010	1,918	14%	-2%
Ethernet 100 Mb/s.....	49,813	1,956	57,002	1,917	14%	-2%
Ethernet 150 Mb/s.....	56,945	2,236	65,163	2,192	14%	-2%
Ethernet 200 Mb/s.....	62,616	2,458	71,652	2,410	14%	-2%
Ethernet 300 Mb/s.....	71,581	2,810	81,910	2,755	14%	-2%
Ethernet 400 Mb/s.....	78,709	3,090	90,067	3,029	14%	-2%

	Current tariff		New tariff		Change	
	per line	per km	per line	per km	per line	per km
Ethernet 0.5 Gb/s.....	84,724	3,326	96,950	3,261	14%	-2%
Ethernet 1 Gb/s.....	106,499	4,181	121,868	4,099	14%	-2%
Ethernet 2 Gb/s.....	133,871	5,256	153,189	5,153	14%	-2%
Ethernet 3 Gb/s.....	153,037	6,009	175,121	5,890	14%	-2%
Ethernet 4 Gb/s.....	168,277	6,607	192,561	6,477	14%	-2%
Ethernet 5 Gb/s.....	181,136	7,112	207,276	6,972	14%	-2%
Ethernet 6 Gb/s.....	192,369	7,553	220,129	7,404	14%	-2%
Ethernet 7 Gb/s.....	202,408	7,947	231,617	7,790	14%	-2%
Ethernet 8 Gb/s.....	211,527	8,305	242,052	8,141	14%	-2%
Ethernet 9 Gb/s.....	219,910	8,634	251,645	8,464	14%	-2%
Ethernet 10 Gb/s.....	227,691	8,940	260,548	8,764	14%	-2%
Fibre-optic, rural.....		8,850		8,645		-2%
Fibre-optic, urban.....		20,528		20,301		-1%
Fibre-optic, 1 thread rural...		7,538		7,363		-2%
Fibre-optic, one thread urban..		17,484		17,290		-1%

8.4.2 The position of the PTA

The Míla conclusion on the new tariff for trunk lines is broadly based on the criteria prescribed by the PTA. In addition to this, amendments and observations from the Administration have been taken into account as is stated above.

The conclusion of the cost analysis is that total costs for the trunk line network are ISK [...] million. It is estimated that this cost will be recovered with revenue from Ethernet service to the amount of ISK [...] million and from revenue from MDH to the amount of ISK [...] million, and from other revenue to the amount of ISK [...] million, and from setup charges to the amount of ISK [...] million, and from monthly charges from traditional leased lines to the amount of ISK [...] million per annum.

Other charges for leased lines remain unchanged:

- Setup charge: ISK 96,386.
- Transfer charge: ISK 48,193.
- Change of speed: ISK 28,164.

Costs of trunk line network are divided according to the following table:

Division of costs	Opex	%	Capex	%	Total	%	Deductible revenue	For calculation
Fibre-optic	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Equipment	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Control network	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Microwaves	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Connections	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
Total	**[...]**	**[...]**	**[...]**	**[...]**	**[...]**	**[...]**	**[...]**	**[...]**

The division of total costs between individual cost units is similar to that in the previous analysis of trunk lines, though the share of microwaves is reduced, but against this the share of connections has increased.

In the Míla tariff the monthly price is divided into unit price for the connection and kilometre price. In order to decide this price, the total cost is divided into costs for connections and costs for distance. Total costs all leased lines are divided as follows:

Division of costs	Total cost	Costs for connections	% of total costs	Costs for distances	% of total costs
Fibre-optic	[...]	[...]	[...]	[...]	[...]
Equipment	[...]	[...]	[...]	[...]	[...]
Control network	[...]	[...]	[...]	[...]	[...]
Microwaves	[...]	[...]	[...]	[...]	[...]
Connections	[...]	[...]	[...]	[...]	[...]
Total	**[...]**	**[...]**	**[...]**	**[...]**	**[...]**

By comparison, the share of costs in the cost analysis for connections was [...]% which means that the share for connections has therefore increased. The share for distances was [...]% and has therefore decreased since the last analysis. This harmonises with the development recommended by the PTA, i.e. that the weighting of distance should diminish in the Míla tariff.

The unit price for base units, i.e. 2 Mb/s leased line, is calculated from the above, costs and number of equivalents. This means that the price for 2 Mb/s leased lines per month is ISK 15,676 and the kilometre charge is ISK 527. The conclusion is that the leased line price of connections increases by about 14% while per kilometre it decreases by about 2%. The average increase on the basis of sold units in December 2017 is about 5.1%.

With all of the above in mind the PTA endorses the new Míla tariff for trunk line connections for leased lines as presented in the revised Míla analysis dated 7 February 2018.

Service product	*Price per line*	*Price per kilometre*
64 kb/s	3,331	112
64 Gb/s protected connection	4,996	168
128 kb/s	4,550	153
128 Gb/s protected connection	6,825	230
256 kb/s	6,215	209
256 Gb/s protected connection	9,323	314
512 kb/s	8,491	286
512 Gb/s protected connection	12,736	428
2 Mb/s	15,676	527
2 Gb/s protected connection	19,595	659
2 Mb/s interconnection current	7,838	527
45 Mb/s	46,611	1,568
45 Gb/s protected connection	69,917	2,352
155 Mb/s	65,872	2,216
622 Mb/s	104,193	3,505
2.5 Gb/s	388,005	13,051
Fibre-optic, rural		8,645
Fibre-optic, urban		20,301
Fibre-optic, 1 thread rural		7,363
Fibre-optic, 1 thread urban		17,290

Service product	*Price per line*	*Price per kilometre*
Ethernet 2 Mb/s	15,676	527
Ethernet 4 Mb/s	21,414	720
Ethernet 6 Mb/s	25,700	864
Ethernet 10 Mb/s	32,342	1,088
Ethernet 20 Mb/s	35,094	1,180
Ethernet 26 Mb/s	38,469	1,294
Ethernet 28 Mb/s	39,480	1,328
Ethernet 30 Mb/s	40,445	1,360
Ethernet 40 Mb/s	44,729	1,504
Ethernet 46 Mb/s	46,971	1,580
Ethernet 48 Mb/s	47,676	1,604
Ethernet 50 Mb/s	48,362	1,627
Ethernet 60 Mb/s	51,549	1,734
Ethernet 80 Mb/s	57,010	1,918
Ethernet 100 Mb/s	57,002	1,917
Ethernet 150 Mb/s	65,163	2,192
Ethernet 200 Mb/s	71,652	2,410
Ethernet 300 Mb/s	81,910	2,755
Ethernet 400 Mb/s	90,067	3,029
Ethernet 0.5 Mb/s	96,950	3,261
Ethernet 1 Mb/s	121,868	4,099
Ethernet 2 Mb/s	153,189	5,153
Ethernet 3 Mb/s	175,121	5,890
Ethernet 4 Mb/s	192,561	6,477
Ethernet 5 Mb/s	207,276	6,972
Ethernet 6 Mb/s	220,129	7,404
Ethernet 7 Mb/s	231,617	7,790
Ethernet 8 Mb/s	242,052	8,141
Ethernet 9 Mb/s	251,645	8,464
Ethernet 10 Mb/s	260,548	8,764

Other price conditions, such as discounts, according to the new tariff remain unchanged.

9 The PTA conclusion

The PTA has now reviewed the Míla cost analysis of the market for trunk line segments of leased lines, which was Market 14 pursuant to the ESA Recommendation from 2004. The PTA bases its review on the obligations imposed on Míla with the Administration's Decision no. 21/2015.

The cost analysis is divided according to the main Míla services on this market, i.e. Ethernet service (on Fibre-optic Ring and outside Fibre-optic Ring), Sync-Ethernet, MDH and other leased lines in the trunk line network. Míla submitted five cost models for analysis of costs for these services. The models were revised during the Administration's processing of the Míla cost analysis. Míla submitted a comprehensive revision of the models on 26 January 2018 and the cost analysis for leased lines was then revised on 7 February 2018 with minor corrections.

The cost analysis is based to all intents and purposes on the same methodology as used in previous analyses and is now based on the operational year 2016.

Míla operations on the trunk line market are to a degree common to these products and for this reason the analysis was made such that separate calculations were made for prices for Ethernet service and for MDH and estimated revenue from these service items was deducted from the total cost base of the trunk line network along with other revenue on this market.

Pursuant to the PTA Decision no. 21/2015, the Administration shall also take into account development of tariffs on comparable competition markets. As the market for trunk line segments of leased lines has in most European countries been defined as a competition market, tariffs for leased lines on these markets are not very accessible and prices often based on offers. In Norway however, the Telenor tariff for leased lines is accessible[5]. The PTA took into account the 2 Mb/s leased line (Digital Punkt til Punkt) and used the average monthly price for a 5 year period on the basis of varying distances. According to this comparison, the average monthly price for a Míla 2 Mb/s leased line is lower than at Telenor for distances less than about 100 km, but higher for longer distances.

It should also be noted that there are various unknown factors in such a price comparison, e.g. various additional costs, which render it impossible to make an exact comparison. The PTA however considers that this comparison does not give reason to reject the Míla cost analysis. The PTA also examined the national tariff for SDH leased lines. The PTA furthermore examined the price for leased lines according to the TDC tariff in Denmark[6] but it is difficult to determine whether the leased lines specified in that tariff are comparable to Míla leased lines.

In the light of the above, the PTA endorses the conclusions of the revised Míla cost analysis dated 26 January 2018 for Ethernet service and, MDH, and dated 7 February 2018 for leased

[5] Prisliste for kapasitetsprodukt, Analoge og digitale leide samband, samt abonnementsmessige oppdrag for øvrige produkt; Versjon 010916; Gjeldende f.o.m. 01 September 2016

[6] Prisregneark2018: http://wholesale.tdc.dk/Produkter/Prisregneark.xlsm.

lines. The Míla tariff for temporary connections remains unchanged as do one time charges such as setup charges.

The tariffs are published in total in Appendix I.

Míla is authorised to add data transfer speeds not specified in the tariffs published here in Appendix I, without submitting a new cost analysis to the PTA, on the condition that the price for the service is calculated in accordance with the methodology and criteria specified here above. The tariff for Ethernet service also applies to locations that Míla may add before the next revision of cost analysis of the market for trunk line segments of leased lines. Míla must however respect notification notice for innovations in its service offer in accordance with the leased line reference offer.

Míla shall furthermore, in accordance with PTA Decision no. 21/2015, submit a revised cost analysis for leased lines, no later than 1 April 2019 and this analysis shall be based on documentation, for the operational year 2018.

The Decision

The Post and Telecom Administration endorses the Míla ehf. cost analysis for trunk line segments of leased lines as last revised on 26 January and 7 February 2018.

Setup charges and price per month for leasing shall be in accordance with Appendix I to this Decision.

Míla ehf. shall notify the coming into force of the new tariff with at least 60 days' notice. The new Míla ehf. tariff shall be part of the company's reference offer for leased lines at the entry into force.

This Decision can be appealed to the Appellate Committee for Electronic Communications and Postal Affairs, see Article 13 of Act no. 69/2003 on the Post and Telecom Administration. The appeal shall have reached the Appellate Committee four weeks from the time that the party in question became aware of the Decision of the Post and Telecom Administration. Costs for an appeal are according to Paragraph 5 of Article 13 of the same Act, and in addition to this there is a special appeal charge to the amount of ISK 150,000, pursuant to Article 6 of Regulation no. 36/2009 on the Appellate Committee for Electronic Communications and Postal Affairs.

Reykjavik, xx 2018

_____

Hrafnkell V. Gíslason, Director

_____

Óskar Þórðarson

Appendix I- Tariff for wholesale market for trunk line segments of leased lines
Appendix II - ESA Opinion