



THE TELECOMMUNICATION TARIFF (SECOND AMENDMENT) ORDER, 2024

Bhutan InfoComm and Media Authority
Royal Government of Bhutan
Thimphu, Bhutan



TITLE, EXTENT AND COMMENCEMENT

In exercise of the powers conferred upon it under section 52(3) of the Bhutan Information Communication and Media Act, 2018, the Bhutan InfoComm and Media Authority hereby makes the following Order further to amend the Telecommunication Tariff (First Amendment) Order, 2009;

1. This Order shall be called **The Telecommunications Tariff (Second Amendment) Order, 2024.**
2. It shall come into force on the **3rd day of April, 2024.**
3. All sections in the Telecommunications Tariff Order, 2009 shall remain unchanged.
4. The schedules I and II in the Telecommunication Tariff (First Amendment) Order, 2009 shall be substituted by these amended new schedules I and II.
5. The Explanatory Memorandum explains the objects and reasons for the Telecommunications Tariff (second Amendment) Order, 2024.
6. This Order shall cover tariffs for leasing of Dark Fiber, Domestic Leased Circuits, International Private Leased Circuits and Internet Leased Lines throughout the territory of Bhutan as also those originating in Bhutan and terminating outside Bhutan.
7. Where a tariff has been specified as a ceiling, the service providers have flexible to offer services at competitive rates/tariff below the ceiling fixed by the Authority.



Director

Bhutan InfoComm and Media Authority (BICMA)

EXPLANATORY MEMORANDUM ON THE REVISION

1. In accordance with the Information, Communications and Media (ICM) Act of Bhutan 2018, the Authority is mandated to regulate ICT and Media facilities and services in the country. One of mandates of the Authority is to determine the tariff, rates and charges of licensed services in accordance with policy directives. Therefore, the Authority determines the tariff, rates and charges of licensed services through issuance of tariff regulation, tariff order and directives on telecommunications tariff.
2. The Telecommunication Tariff Order (TTO), 2009 and Telecommunication Tariff (First Amendment) Order, 2009 focused on making ICT services more affordable, particularly in leasing of Dark Fiber, Domestic Leased Circuits and Internet Leased Line (ILL) services in the country. The Authority has amended the Telecommunication Tariff Order, 2009 and its first amendment basically to have a Tariff order in line with the context of the current ICT/Telecommunication ecosystem and to keep pace with fast changing ICT and telecommunication technology.
3. The most commonly used approaches when adopting a methodology to determine the price of a Leased Line (LL) are as follows:
 - a. Lump Sum
 - b. Multiplying the distance by a variable part (VP) per Kilometer (Km)
 - c. Combinations of approaches (a) and (b)
4. Therefore, the proposed methodology for the Telecommunication Tariff (Second Amendment) Order, 2024 is combination of methodologies i.e., methodology (c). Furthermore, the tariff calculation for leasing of dark fiber is based on a “binomial” expression with a fixed part (FP) and a variable part (VP) per kilometer according to the formula:

$$\text{Tariff (BW)} = \text{FP} + \text{VP} \times \text{Length of LL}$$

5. Additionally, to take into account the economies of scale in Domestic Leased Circuit, the (FP+VP) is multiplied by the expression $(1 + \frac{1}{(n+1)})$. This therefore gives the expression for each category and bandwidth.

$$\text{Tariff (BW)} = (\text{FP} + \text{VP}) \times \text{length LL} \times (1 + \frac{1}{(n+1)}). \quad \text{Where } n=1,2,3,\dots$$

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6. The pricing model was based on top-down cost-based approach as discussed during the consultation meeting with the stakeholders.
7. The components taken into account for the calculating the CAPEX recovery are the following:
 - a. Rate of return
 - b. Depreciation
 - c. Operation and maintenance

The rate of return is the return on the investment and the depreciation allows the replacement of the assets at the end of the life of the investment assets. These are discussed in detail in the following paragraphs.

8. Depreciation allowance is function that allows businesses to recover the cost over the life of the assets. The Rules on the Income Tax Act of Kingdom of Bhutan was used to determine the life of the assets which allows a maximum rate of 15% for equipment and 5% for transmission.
9. The rate of return of CAPEX recovery is given by the following formula:

$$\text{Return of Capex} = \text{Capital Expenditure} \times 15\%$$

The return of CAPEX is the annual return on the investment made, which will include the cost of the equipment, cost of power, infrastructure cost, rental and other variable costs. Contrary to previous consultations, the CAPEX recovery consisting of depreciation allowance and rate of return on capital is taken as 15% for telecommunications equipment and 5% for dark fiber.

10. The operation and maintenance (O&M) cost refers to the expenses associated with the maintenance of the capital expenditure, ensuring that the services are delivered without interruption. The O&M cost is taken at 10% of the CAPEX.
11. As capacity utilization is a critical factor when determining the tariff, the capacity utilization was taken at 60%, the same as percentage that was agreed from the first consultation for the development of the Telecommunication Tariff Order 2009.



Methodology Adopted for Fixation of Cost-based Ceiling Tariff for Dark Fiber

1. The ceiling tariff given under The Telecommunication Tariff (Second Amendment) Order, 2024 is applicable to those fibers funded by the licensed ICT facility operators, for which the cost of pair of dark fiber per annum per kilometer has thus been calculated and fixed at **Nu. 7,367** using the methodologies given below.
2. The Fixed cost component of Nu. 100,000 (License Access fee paid by the licensee during the time of acquiring the license) and the variable costs (depreciation, Rate of return and Operation and maintenance costs) in provision of the Government owned dark fiber (OPGW and ADSS) arising from the CAPEX recovery have been excluded as per the directive of the erstwhile Ministry of Information and Communications(MoIC). Therefore, the cost per pair for leasing of the Government owned dark fiber shall remain zero until there is changes in policy/directives from the government on the leasing of the Government owned dark fiber.
3. There exist two broad categories of cost items in the provision of Dark Fiber and these are fixed cost and variable cost. Additionally, there is an annual regulatory/license fee that is added to the costs to arrive at the tariff applicable for dark fiber.
4. For the calculation of the fixed part (FP), the following are taken into account:
 - a. License fee (fixed rate of Nu. 100,000/-)
 - b. Rate of return of license fee at 10%
5. For the calculation of the variable part (VP), the rates used for the determination of the tariff of dark fiber is the same as those that was used in the Telecommunication Tariff Order 2009. The following are taken into account:
 - a. Cost of the OPGW/ADSS (rate at Nu. 200,000/-)
 - b. Capex Recovery Cost at 10%
 - c. Capex Recovery Cost (Depreciation) at 5%
 - d. Operation and maintenance cost at 10%
6. To factor in the economies of scale, the 50 km distance was used as the benchmark.

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Methodology Adopted for Fixation of Cost-based Ceiling Tariff for Domestic Leased Circuits (Domestic Bandwidths)

1. There exist two broad categories of cost items for domestic leased circuits which are fixed cost and variable cost. Additionally, there is an annual regulatory/license fee that is added to the cost to arrive at the tariff applicable for domestic leased circuits.
2. For the calculation of the fixed part (FP), the following are taken into account:
 - a. License fee (fixed rate of Nu. 100,000/-).
 - b. Rate of return of license fee at 10%.
3. For the calculation of the variable part (VP), the following are taken into account:
 - a. CAPEX Recovery Cost (actual)- cost of Equipment, Power and Infrastructure.
 - b. Operation and maintenance cost at 10%.
 - c. Return on Investment at 10%.
4. When determining the tariff, the two dominant operators were taken into account, viz. Bhutan Telecom Ltd. (BTL) and Tashi Info Comm Ltd. (TICL) and an average tariff of BTL and TICL was taken to derive the final ceiling tariff.
5. Furthermore, the following considerations were taken while calculating the tariff for domestic leased circuit:
 - a. Distance: The calculation for the domestic leased circuits were based on the distance between Thimphu and Phuentsholing, i.e., a distance of 110 km.
 - b. Cost of Equipment: The manufacturer of the equipment used by the operators were different and the cost of equipment of each operator varies. Therefore, the cost and capacity for each operator were taken separately.
6. In this Tariff Order, the bandwidths range are maintained against the distance range with increasing order of 50 km. The economies of scale factor are applied only for the bandwidth range and linear calculation is considered for distance range as discussed and agreed during the consultation meeting. The following table gives the proposed tariff in Nu. for domestic leased circuits.



Methodology Adopted for Fixation of Cost-based Tariff for ILL (Internet Leased Line) and IPLC (International Private Leased Circuit)

1. The most commonly used cost methodology for Internet Leased Line (ILL) to determine the price of a leased line is:
 - a. Lump Sum per bandwidth

The distance is not considered when providing an internet leased line. However, due to the fact that international connectivity for various Internet Service Providers (ISPs) is different, a tariff cannot be proposed.

2. In addition to the Telecommunication Tariff (First Amendment) Order, 2009, the following parameters is considered for the determination of Internet Leased Line (ILL):
 - a. Cost per Mbps of ILL and IPLC at the border gateway
 - b. Total capital expenditure or cost of providing ILL per month
 - c. Rate of return
 - d. Operational and maintenance cost (O&M).

3. The following methodology may be used for determining the ILL Cost:

1. Fixed Cost	A. Cost of International Internet Leased Line till the border gateway
	B. Total Bandwidth subscription
Subtotal I	Cost per Mbps = A/B
2. Variable Cost	C. Total Capital expenditure per month
	D. Return on investment of (C) (@10%)
	E. Operation and Maintenance (@15% of (C))
Sub-Total II	SUM of C+D+E
Cost Internet Leased Line (including License Fee)	(Subtotal I + Subtotal II) x 1% license fee



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Schedule I – Dark Fiber

ITEM	TARIFF
1. Date of Implementation	3 rd April, 2024
2. Coverage	a) It is mandatory for Dark Fiber to be provided when such capacity is available with the licensed service providers b) All tariffs specified as ceiling c) Service providers may offer discounts on the ceiling tariffs. Discounts, if offered, shall be transparent and non-discriminatory and subject to approval from the Authority
3. Ready reckoner for Dark Fiber	As specified in Annexure I to this Schedule
4. Local leads or end links	Tariff for local lead (or end links) to be charged as follows: a) Charge for leasing these local leads shall be as per the ceilings specified in Annexure I of this Order. Detail costing methodology used for determining the ceiling tariff for leasing of dark fiber is specified in Annexure III. b) If such leasing is technically not feasible then on Rent and Guarantee Basis / Special Construction basis
5. Other matters relevant to Dark Fiber not specified in this Schedule	Forbearance



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Schedule II – Domestic Leased Line (DLC)

ITEM	TARIFF
1. Date of Implementation	3 rd April, 2024
2. Coverage	a) It is mandatory for DLC to be provided when such capacity is available with the licensed service providers b) All tariffs specified as ceiling c) Service providers may offer discounts on the ceiling tariffs. Discounts, if offered, shall be transparent and non-discriminatory and subject to approval from the Authority
3. Ready reckoner for DLC	As specified in Annexure II to this Schedule
4. Local leads or end links	Tariff for local lead (or end links) to be charged as follows: a) Charge for leasing these local leads shall be as per the ceilings specified in Annexure II of this Order. The detailed costing methodology used for determination of ceiling tariff for DLC is specified in Annexure IV. b) If such leasing is technically not feasible then on Rent and Guarantee Basis / Special Construction basis
5. Other matters relevant to DLC not specified in this Schedule	Forbearance

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Schedule III –Internet Leased Lines (ILL)

ITEM	TARIFF
1. Date of Implementation	3 rd April, 2024
2. Coverage	<p>a) It is mandatory for ILL to be provided when such capacity is available with the licensed service providers</p> <p>b) All tariffs will be determined as per the formulae set out in this Tariff Order and approved by the Authority</p> <p>c) Service providers may offer discounts on the ceiling tariffs. Discounts, if offered, shall be transparent and non-discriminatory and subject to approval from the Authority</p>
3. Local leads or end links	<p>Tariff for local lead (or end links) to be charged as follows:</p> <p>a) Charge for leasing these local leads shall be as per the ceilings specified in this Order</p> <p>b) If such leasing is technically not feasible then on special construction basis</p>
4. Other matters relevant to ILL not specified in this Schedule	Forbearance

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Annexure I – Ready Reckoner Ceiling Tariff for Dark Fiber in Nu. per Annum

Distance (Km)	Tariff for Dark Fiber (Per Pair)
1	7,367
5	31,170
10	60,923
25	150,184
30	179,937
35	209,690
40	239,444
45	269,197
50	298,951
55	317,904
60	334,893
65	349,918
70	362,980
75	374,078
80	383,212
85	390,383
90	395,590
95	398,833
100	400,112
105	412,218
110	424,567
115	436,259
120	447,296
125	457,678
130	467,403
135	476,473
140	484,887
145	492,645
150	499,747

Distance (Km)	Tariff for Dark Fiber (Per Pair)
155	511,193
160	522,306
165	533,085
170	543,531
175	553,644
180	563,424
185	572,870
190	581,983
195	590,763
200	599,210
205	610,068
210	620,727
215	631,187
220	641,447
225	651,508
230	661,369
235	671,031
240	680,494
245	689,758
250	698,821
255	708,369
260	717,744
265	726,946
270	735,976
275	744,834
280	753,518
285	762,031
290	770,370
295	778,537
300	786,532

Distance (Km)	Tariff for Dark Fiber (Per Pair)
305	795,080
310	803,478
315	811,729
320	819,830
325	827,783
330	835,587
335	843,242
340	850,749
345	858,107
350	865,316
355	873,115
360	880,787
365	888,330
370	895,746
375	903,034
380	910,194
385	917,226
390	924,130
395	930,906
400	937,554
405	944,797
410	951,930
415	958,953
420	965,866
425	972,669
430	979,362
435	985,944
440	992,417
445	998,779
450	1,005,032

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Annexure II – Ready Reckoner Ceiling Tariff for Domestic Leased Circuits (Domestic bandwidths) in Nu. per Month

Distance (in Km) → (Linear factor) →	0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	400-450	450 and above	Economies of scale factor
	1	2	3	4	5	6	7	8	9	10	
Bandwidth (in Mbps) ↓											
0-100	3,168	6,336	9,504	12,672	15,840	19,008	22,176	25,344	28,512	31,680	
101-200	4,752	9,504	14,256	19,008	23,760	28,512	33,264	38,016	42,768	47,520	1.50
201-300	6,320	12,640	18,960	25,281	31,601	37,921	44,241	50,561	56,881	63,202	1.33
301-400	7,900	15,800	23,701	31,601	39,501	47,401	55,301	63,202	71,102	79,002	1.25
401-500	9,480	18,960	28,441	37,921	47,401	56,881	66,362	75,842	85,322	94,802	1.20
501-600	11,092	22,184	33,276	44,368	55,459	66,551	77,643	88,735	99,827	110,919	1.17
601-700	12,645	25,289	37,934	50,579	63,224	75,868	88,513	101,158	113,803	126,447	1.14
701-800	14,162	28,324	42,486	56,648	70,811	84,973	99,135	113,297	127,459	141,621	1.12
801-900	15,720	31,440	47,160	62,880	78,600	94,320	110,040	125,760	141,480	157,199	1.11
901-1000	17,292	34,584	51,876	69,168	86,460	103,752	121,044	138,336	155,627	172,919	1.10
1001-2000	18,848	37,696	56,545	75,393	94,241	113,089	131,938	150,786	169,634	188,482	1.09
2001-3000	20,356	40,712	61,068	81,424	101,780	122,136	142,493	162,849	183,205	203,561	1.08
3001-4000	21,903	43,806	65,709	87,613	109,516	131,419	153,322	175,225	197,128	219,031	1.076
4001-5000	23,458	46,917	70,375	93,833	117,291	140,750	164,208	187,666	211,124	234,583	1.071
5001-6000	25,030	50,060	75,090	100,120	125,150	150,180	175,210	200,240	225,270	250,300	1.067
6001-7000	26,582	53,164	79,745	106,327	132,909	159,491	186,073	212,655	239,236	265,818	1.062
7001-8000	28,150	56,300	84,450	112,601	140,751	168,901	197,051	225,201	253,351	281,501	1.059
8001-9000	29,698	59,397	89,095	118,794	148,492	178,190	207,889	237,587	267,286	296,984	1.055
9001-10000	31,243	62,485	93,728	124,971	156,214	187,456	218,699	249,942	281,184	312,427	1.052

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Annexure III – Detailed Costing Methodology used for determination of Ceiling Tariff for Leasing of Dark Fiber

	Cost of Equipment (in Nu)	Cost of 12 pairs/km	Cost per Pair	Capacity Utilization (app at 60%(B/0.60))	Cost per Pair /Km
Fixed Cost					
A	License Fee	100000		1	
	Rate of Return (WACC) @10%	10000	833	1389	1389
	Sub Total	110000	833	1389	1389
Variable Cost					
B	Cost of OPGW 24F	164000			
	Cost of ADSS 24F	123000			
	Cost of ADSS 72F	155000			
	Cost (estimate in 2016)	200000			
	CAPEX Recovery Cost (WACC @10%)	20000	1667	2778	2778
	CAPEX Recovery Cost (Depreciation @5%)	10000	833	1389	1389
	OPEX (@10%)	20000	1667		1667
	Total	250000	4167	4167	5834

Distance (Km)	Fixed Cost contribution to rental	Variable Cost contribution to rental	Total Cost per pair	Annual ceiling tariff per pair of dark fiber with License Fee @ 2% (in Nu)
1	1389	5834	7223	7367
5	1389	29170	30559	31170
10	1389	58340	59729	60924
25	1389	145850	147239	150184
30	1389	175020	176409	179937
35	1389	204190	205579	209691
40	1389	233360	234749	239444
45	1389	262530	263919	269197
50	1389	291700	293089	298951
100	1389	390878	392267	400112
150	1389	488560	489949	499748
200	1389	586072	587461	599210
250	1389	683730	685119	698822
300	1389	769720	771109	786532
350	1389	846960	848349	865316
400	1389	917782	919171	937554
450 and above	1389	983936	985325	1005032

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Annexure III – Detailed Costing Methodology used for determination of Ceiling Tariff for DLC (Domestic Leased Circuits)

Cost Elements	Cost per channel	Cost per Month	Cost per Month per Km	
Fixed Cost				
initial License fee	100,000.00			
Rate of Return (@10%)	10,000.00			
Sub Total I	110,000.00	611.11	5.56	
Variable Cost				
Cost of Equipment considering one channel at 1 Gbps				
Cost of power equipment for one channel				
Cost of Infrastructure (civil work etc.) for one channel				
Total of Variable Cost				
CAPEX Recovery Cost (equipment lifetime at 7 years)				
Operating & Maintenance Cost of Equipment (@10%)				
Return on Investment (@10%)				
Sub Total - I				
Semi-Variable Cost				
Rental and Co location				
Right of Way				
Sub Total - II				
Sum of Variable Part				
Grand Total (for 1 Gbps)				
			Cost per Mbps per Month per Km	
			Cost per Mbps per Month per Km with 2% license fee	
			Cost per Month of 100 Mbps at 50 Km	

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