



Telecommunications Tariff (First Amendment)

Order 2009

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Bhutan InfoComm and Media Authority

Royal Government of Bhutan

Thimphu, Bhutan

In exercise of the powers conferred upon it under Section 27 (3)(o) of the Bhutan Information, Communications and Media Act 2006 (" the Act"), the Bhutan InfoComm and Media Authority ("the Authority") hereby makes the following Order further to amend the Telecommunication Tariff Order, 2009.

1. This Order shall be called the **Telecommunication Tariff (First Amendment) Order, 2009.**
2. It shall come into force on the **1st day of July, 2012.**
3. All sections in the Telecommunication Tariff Order, 2009 shall remain unchanged.
4. The schedules I and II in the Telecommunication Tariff Order, 2009, shall be substituted by these amended new schedules I and II.
5. The Explanatory Memorandum explains the objects and reasons for the Telecommunication Tariff (First Amendment) Order, 2009.
6. This Order mandates detailed publication of the tariff applicable for each of the services covered under this Order, including the mark-up and the lease rentals being paid to international carriers by any Bhutanese operators.

BY ORDER:



(Director)

Bhutan InfoComm and Media Authority

Thimphu



EXPLANATORY MEMORANDUM ON THE REVISION

Background

1. Hon'ble Minister for Information and Communications Ministry vide letter no. MoIC (M)/2A/2011/ dated August 17, 2011 has directed the Authority to revise the Telecommunication Tariff Order 2009 and implement the revised Order with effect from **November 01, 2011**.

The main objective of this revision is to make ICT and media services universally accessible at affordable prices throughout country particularly in the rural and remote areas.

2. The Royal Government of Bhutan (RGoB) is determined to connect the people of Bhutan through ICT services, facilitate them to access better services and enhance economic and employment opportunity within an ICT enable knowledge based society. In order to achieve this objective, the RGoB had issued two consecutive Executive Orders (first on June 18, 2009 and then on December 31, 2010) for creating conducive environment for making ICT services easily accessible at an affordable rate by the people of Bhutan.
3. The Executive Order of 2011 highlights on the importance of "Achieving Gross National Happiness (GNH) through ICT" by aspiring to creating 2,500 jobs by 2013; brand Bhutan as Hi-Tech ICT destination by 2013, and facilitating local participation.



4. The first (June, 2009) Order focuses on nationalizing the fibre networks owned by Bhutan Telecom Ltd. (BTL) and Bhutan Power Corporation Ltd. (BPC) for creating level playing field for the various business involved in the ICT Sector.

The RGoB believed that nationalizing all telecommunication backhaul (Fibre) network would bring down the cost of accessing such network (fibre); make such fibre accessible by any individual dwelling; and conducting business within the Kingdom of Bhutan.

5. The second (December, 2010) Order directed Ministry of information and Communications (MoIC) to market and to promote Bhutan for creating demand for ICT/IT foreign firms to invest in Bhutan and facilitate local partnerships for these firms. Along with BPC, they have also been directed to ensure parity with Indian telecom bandwidth rates to IT/ITES businesses.

6. Foreign firms interested in investing in the Bhutanese ICT sector are of the opinion that the cost of connectivity is high compared with neighbouring India. To dispel such concern and to make cost off connectivity comparable with the neighbouring countries, the MoIC, as per the Executive Oder of the RGoB, directed the Authority to review the existing Telecommunication Tariff Order 2009 and make revision based on the following :

- a) Rate of Return (RoR) on fibre = 0 %
- b) Deprecation = 0 %
- c) Operation and Maintenance (O&M) cost = 0 %

7. Based on the Directive of the Ministry, the Authority amended the Telecommunications Tariff Order 2009. It was made public in March 2012 with the intent to implement from 1 April, 2012. However, the Authority received a joint-



appeal from Bhutan Telecom Ltd. (BTL) and Tashi InfoComm Ltd (TICL) against the Tariff determination on 24 April, 2012.

8. In order to understand the difficulty in implementing the Authority's Tariff determination, a consultation with BTL and TICL was conducted on 25 April, 2012. It was then agreed to set-up joint taskforce to review and then to submit comprehensive counter proposal to Authority.



Methodology of fixation of Cost based ceiling tariff for Dark Fibre

1. The pricing model for fibre was based on cost based approach as discussed and agreed during the previous consultation held in the year 2009.
2. Contrary to the previous consultation, a top-down cost model for arriving at annual lease rental of dark fibre has been adopted.
3. The fixed cost component of Nu. 100,000 (entry fee paid by the licensee during the time of acquiring the licence) and the variable costs (depreciation, rate of return, and operation and maintenance) in the provision of dark fibre arising from the CAPEX recovery have been excluded as per the Directive of the MoIC.
4. Based on the above explanations, the cost per pair of fibre is zero and the MoIC decides the allocation of the dark fibre.
5. For those fibre which are funded by individual licensed ICT facility operators, the cost of pair of dark fibre per annum per kilometre will be same the rate determined in the Telecommunications Tariff Order 2009; that is **Nu. 10, 220.00**



Methodology of fixation of cost based ceiling Tariff for Domestic Leased Circuits

1. The Authority has chosen to adopt the cost-based methodology using bottom-up approach that captures the current market realities. This bottom-up approach used costs of disaggregated network elements to derive annual rental value. The capacity of the network assumed for the purpose of cost calculations is STM1.
2. Two broad cost components have been used for calculating the cost of domestic bandwidth; capital and operation and maintenance cost.

2.1 Capital/fixed cost: The equipment cost including infrastructure cost (shelter, power, land, and tower) and civil work cost are taken as the capital/fixed cost. The total cost of STM 1 System was taken as **Nu. 0.72 Million**. This cost includes the cost of equipments, accessories, installation and power system.

The cost of infrastructure was taken as **Nu. 2.81 Million**. This cost includes the cost of shelter, power equipments, land and civil work.

A sum of **Nu. 0.18 Million** was also taken as Import duty and taxes; 15 percent (10 percent import and 5 percent sale) tax.

The total capital cost is around **Nu. 4.92 Million** per site. However, only fifty percent (50 %) of the Capital Cost of infrastructure was factored for E1 Costing; **Nu. 2.5 Million**.



2.2 Operational and Maintenance (O&M): This cost includes the cost of man-power, electricity, DEG fuel, vehicle and Annual Maintenance Cost (AMC)¹. A sum of **Nu. 0.093 Million** was taken as the O&M cost per site. This figure is equivalent to fifteen percent (15%) of the capital expenditure.

3. Rate of return on Capital cost: Ten percent (10 %) rate of return was allowed on the capital cost.

4. Depreciation: The equipment's life span is taken as five (5) years; that is, the capital recovery is taken as five (5) years.

5. The capacity utilization is taken as hundred percent (100%) for the purpose of calculation least-circuit of various capacities; E1 (2 Mbps), DS-3 (45 Mbps) and STM-1 (155 Mbps).

6. Determining the cost of E1 circuit: Since the cost of fibre is zero and the standard distance of 50 Km has been used for the purpose of this calculation. This is due to the fact that the Small Firmware Plugins (SFPs) for STM-1 equipment/OSNs are 50 KM and there is a need to install repeaters after every 50 KM.

The cost of E1 (2 Mbps) circuit for every 50 Kms is calculated at **Nu. 2,400 per month** or **Nu. 28,800 per annum**

7. Determining the Cost of DS3 and STM1 Circuit Per month: Bottom-up approached has been used. In order to arrive at the cost of DS3 and STM-1 circuit for every 50 Km, we consider the approximation that there are 22 E1's in a DS3 circuit and 63 E1's in STM-1 circuit and multiply these figures directly by the rate of one E1.

¹ AMC is the annual maintenance contract signed by operators with the equipment vendors. The AMC included in the cost calculation is the AMC for Equipments only (in this case OSNs). While they pay 25-30% as AMC for sophisticated equipments and applications like IN, MSC, BSC and billing, a minimum of 15 % is charged as the AMC for Routers and Transmission systems. Therefore, this minimum value of 15% is taken as AMC on equipment



However; since provisioning and O&M cost is much cheaper for DS3 and STM 1 circuits as compared to individuals E1's, the efficiency or cost saving² factor of 25% was applied as shown below:

Circuit	Arrived Price Per Month for 50 KM	Cost Saving Factor (%)	Proposed Price for 50 KM per month
DS3	50,400.00	25	37,800.00
STM-1	1,51,200.00	25	1,13,400.00

Table1: Summary of cost of DS-3 and STM-1 Circuit per month per 50 Kms distance

8. For determining the last mile connectivity cost; that is the cost of connectivity between the sub-station as well as end-user's premises, the operator shall seek charging principle methodology from the Authority. However, the operators are only allowed to chare one-time set-up fee on actual basis for providing the last-mile connectivity.

The cost of last mile access is not considered in this costing as this cost is technologically dependent. That is, the last mile can be either connected wirelessly or

² For DS3 and STM-1 circuits, there will be:

- (i) A maximum saving on the maintenance as they just need to maintain one link instead of 21 or 63 circuits as in the case of E1s.
- (ii) Saving on equipments as E1 interface cards need not be procured. STM-1 or DS3 cards are enough for the purpose.
- (iii) Saving on human resource and time as provisioning DS3 or STM-1 circuit is simpler; less physical work and is easy to monitor.



through wired (fibre or copper-wire) depending upon the choice of the end-user or availability of operator's infrastructure.

- 9. Ceiling of IPLC/ILL circuits:** Since Bhutan does not have direct access to submarine cable system and must depend on India based on international carriers to provide international backbone connectivity to Bhutanese operators; the Authority adopted the same mark-up on the international prices as decided in 2009.

A maximum of 2.5 % over the lease rental payable for IPLC and ILL to international carriers has been adopted as the ceiling price. Beside the mark-up, any applicable tax payable to RGoB may also be added to the ceiling price.

The mark-up includes cost of inter-alia handling charges, billing, annual negotiation, customer relationship management and other relevant mediation between Bhutanese operators and the international carriers outside Bhutan.



Schedule I

Dark fibre and Domestic leased-line circuit (DLC)

ITEM	TARIFF
1. Date of implementation	01.07.2012
2. Coverage	a) It is mandatory for Dark Fibre and Domestic Leased Circuits to be provided when such capacity is available with the licensed service providers. b) All tariffs specified as ceiling.
3. Ready reckoner for Dark Fibre	As determined by the government.
4. Ready reckoner for DLC	
a) 2Mbps (E-1)	As specified in Annexure 1 to this Schedule
b) 45 Mbps(DS-3)	As specified in Annexure 2 to this Schedule
c) 155 Mbps (STM-1)	As specified in Annexure 3 to this Schedule
5. 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 1 to 5 of this Order, or b) If such leasing is technically not feasible then on special Construction basis.
6. Other matters relevant to Dark Fibre and Domestic Leased Circuits not specified in this Schedule	Forbearance



Schedule - II

International Private Leased Circuits (IPLC) and Internet Leased Lines (ILL)

ITEM	TARIFF
1. Date of implementation	01.07.2012
2. Mark-up over the Tariffs payable to International carriers outside Bhutan in respect of IPLC and ILL	Not exceeding 2.5% plus any applicable tax
3. Coverage	<p>a) Ceiling on mark-up will be applicable for all destinations and all type of cable system used for carrying either voice or data or both.</p> <p>b) Service Provider may offer discount on the ceiling mark-up. Discount, if any offered shall be transparent and non-discriminatory based on laid down criteria and subject to reporting requirement.</p>
4. Other matters relevant to IPLC and ILL not specified in this Schedule	Forbearance



Annexure 1

Ready-Reckoner Ceiling Tariff in Nu per Annum for 2 Mbps

(E-1) Domestic Leased Circuits

Distance (Km)	Tariff
0-50	28,800
51-100	57,600
101-150	86,400
151-200	115,200
201-250	144,000
251-300	172,800
301-350	201,600
351-400	230,400
401-450	259,200
451-500	288,000



Annexure 2

Ready-Reckoner Ceiling Tariff in Nu per Annum for 45 Mbps (DS-3) Domestic leased Circuit

Distance (Km)	Tariff
0-50	453,600
51-100	907,200
101-150	1,360,800
151-200	1,814,400
201-250	2,268,000
251-300	2,721,600
301-350	3,175,200
351-400	3,628,800
401-450	4,082,400
451-500	4,536,000



Annexure 3

Ready-Reckoner Ceiling Tariff in Nu per Annum for 155 Mbps (STM-1) Domestic leased Circuit

Distance (Km)	Tariff
0-50	1,360,800
51-100	2,771,600
101-150	4,082,400
151-200	5,443,200
201-250	6,804,00
251-300	8,164,800
301-350	9,525,600
351-400	10,886,400
401-450	12,247,200
451-500	13,608,000



Annexure 4

Comparison of the revised tariffs with the tariff of 2009

1. E1 (2 Mbps)

Distance (Km)	Tariff - 2009	Revised Tariff	% Reduction
50	64,241	28,800	55.2
100	121,521	57,600	52.6
200	236,082	115,200	51.2
300	350,643	172,800	50.7
400	465,204	230,400	50.5
500	579,766	288,000	50.3

2. DS- 3 (45 Mbps)

Distance (Km)	Tariff - 2009	Revised Tariff	% Reduction
50	614,955	453,600	26.3
100	1,162,130	907,200	21.94
200	2,256,479	1,814,400	19.6
300	3,350,829	2,721,600	18.8
400	4,445,178	3,628,800	18.4
500	5,539,527	4,536,000	18.12



3. STM - 1 (155 Mbps)

Distance (Km)	Tariff - 2009	Revised Tariff	% Reduction
50	1,739,995	1,360,800	21.8
100	3,287,845	2,771,600	15.7
200	6,383,546	5,443,200	14.73
300	9,479,246	8,164,800	13.9
400	12,574,946	10,886,400	13.43
500	15,670,647	13,608,000	13.2



Issues raised by the stakeholders during the Consultation Meeting held on 10 November 2011

Issue 1: Since the costing of dark fibre would be based only on recovering the CAPEX of Nu. 100,000(BPC's license fee), the dark fibre cost should be same, irrespective of the distance.

BICMA: After reviewing this issue, the MoIC issued a supplementary directive to exclude Nu. 100,000 (BPC's Licence fee) for determining the cost of the fibre.

Issue 2: In the calculation of domestic leased circuit, the cost of equipment (STM 1), power supply and other miscellaneous costs be used as the semi-variable cost rather than taking into account the cost of the repeaters in every 50 Km distance.

BICMA: After reviewing this issue, the Authority found that applying the cost of equipment, power supply and other miscellaneous cost will not be appropriate.

The cost of STM 1 equipment including the cost of power system and other related cost are already taken into account while calculating the cost of domestic leased circuits (STM-1, DS-3, E1, 64 Kbps, 128 Kbps, 256 Kbps and 512 Kbps). If this cost is again



used for calculating the semi-variable cost, then it will amount to double costing.

Issue 3: The O&M of 2.5% used for the calculation the domestic leased circuit cost to be revised based on actual cost.

BICMA: The stakeholders did not submit the evidence on why the O&M cost need to be revised. Thus, the same O&M cost (2.5 %) is applied for calculating the ceiling tariff for domestic leased circuits.

Issue 4: The amended tariff order is applicable only for fibre and for radio links, it was suggested that the cost to be determined on a case by case.

BICMA: The Authority agreed that this Telecommunication Tariff (First Amendment) Order 2009 will only be applied to dark fibre and fibre based domestic leased circuit.

Issue 5: As the mark-up (2.5%) on the IPLC/ILL does not include any applicable taxes, it was suggested that such taxes be added to the ceiling price.

BICMA: The Authority agreed on this issue. The ceiling price shall be mark- up plus any other applicable.



Appeal made by the stakeholders during the Consultation Meeting held on 24 April 2012

1. The pricing model for Fibre adopted by BICMA was based on cost. Since the fibre cost has become zero, the cost of fibre is no longer applicable in calculating the pricing.
2. BICMA has taken two units of STM4 system into consideration for fixed cost (end to end). With this, it is impossible to provide services at locations that fall in between the two ends. Adding repeaters in between do not solve this problem as repeaters are merely passive devices. Therefore, they feel that STM-1 system with E1 interfaces is the best approach to arrive at the cost. This system shall be repeated every after 40 KM of fibre distance.
3. The capital cost for housing STM equipments, power system, project cost, interest on capital, applicable taxes, fibre drop in connectivity works were not taken into consideration for calculating the cost of domestic leased-circuit pricing. The realistic costs for these are much higher than the cost of the STM system itself and must be incorporated in the costing.



4. 64 kbps, 128 kbps, 256 kbps and 512 kbps pricing are not applicable, as at the minimum only E1 can be extracted. Minimum bandwidth pricing must be based on E1 even if the customer wishes to take the lower bandwidths. Hence, for any bandwidth below E1 level, they propose the cost of E1 circuit.
5. The O&M costs used by BICMA for pricing were not realistic. They feel that AMC, infrastructure utilities, staffs costs were not considered in pricing model.
6. For placing shelter, it is necessary that we either lease land or purchase it. This is absolutely necessary for new entrant (TICL) as construction of their own exchanges is not financially viable. Procuring or leasing land is also necessary for the incumbent (BTL) since most of their existing exchanges are located far from the BPC fibre drops substations. Therefore, the only economical solution would be to have the shelter nearby the BPC substation. Hence, the cost factor of land is must for cost calculation otherwise the cost of shelter will never come into picture.

