



Telecom Regulatory Authority of India



**Consultation Paper on
Review of Interconnection Usage Charges**

New Delhi, the 18th September 2019

Stakeholders are requested to furnish their written comments by 18.10.2019 and counter-comments by 01.11.2019 to the Advisor (Broadband and Policy Analysis), TRAI. The comments may also be sent by e-mail to interconnection.trai@gmail.com and sksinghal@trai.gov.in. Comments would be posted on TRAI's website www.trai.gov.in. For any clarification/ information, Shri Sunil Kumar Singhal, Advisor (Broadband and Policy Analysis), TRAI may be contacted at Tel. No. +91-11-23221509.

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Chapter - I

Introduction

A. Interconnection

- 1.1. Interconnection between two public telecommunication networks allows consumers of one service provider to communicate with consumers of the other service provider. Without an effective interconnection, the individual networks would develop as discrete islands. It would defeat the purpose of establishing cohesive telecommunication network, and economic benefits arising out of seamless communication across the consumers of telecommunication services would be limited. For competition to develop and the market to evolve efficiently, it is essential that consumers of one network communicate with those of another network.

- 1.2. In a broader sense, the term interconnection refers to the technical and commercial arrangement under which service providers connect their equipment, networks, and services to enable their subscribers to have access to the subscribers, services, and networks of other service providers. Interconnection is the lifeline of telecommunications. It is one of the foundations of viable competition which in turn is the main driver for growth and innovation in telecommunication markets.

- 1.3. The principal regulation for IUC of voice calls was notified by the Authority through "The Telecommunication Interconnection Usage Charges (IUC Regulation), 2003 (4 of 2003)" dated 29/10/2003. This Regulation laid down uniform termination charge of ₹ 0.30 per minute, irrespective of distances in all types of calls, effective from 1/2/2004. Its next review for call termination charges was undertaken in the year 2008-09, based on which the same were amended as follows:
 - a. Termination charge of ₹ 0.20 per minute for local and national long-distance voice calls to fixed line and mobile (revised downwards from the erstwhile charge of ₹ 0.30 per minute).
 - b. Termination charge of ₹ 0.40 per minute for international long-distance call (revised upwards from the erstwhile charge of ₹ 0.30 per minute).

- 1.4. The domestic call termination charges were further revised, through the Regulation of 2015 to ₹ 0.14 per minute for wireless to wireless calls and 0 paisa for calls involving wireline telephony at either end of communication. Subsequently, the

Telecommunication Interconnection Usage Charges (Thirteenth Amendment) Regulations, 2017 dated 19.09.2017 [herein after referred to as IUC Regulations, 2017 brought down wireless to wireless domestic call termination charge to ₹ 0.06 per minute, effective from 1/10/2017 to 31/12/2019. It further prescribed Bill And Keep (BAK) regime i.e. zero termination charge, effective from 1/1/2020 for domestic call termination. Some stakeholders challenged the IUC Regulation of 2017 in the Hon'ble High Court of Bombay. The matter is sub-judice.

- 1.5. While reaching the conclusion relating to BAK regime from 01.01.2020, the Authority, in the Explanatory Memorandum (EM) annexed to the IUC Regulations, 2017 dated 19.09.2017, opined that approximately after 2 years from the date of notification of the these regulations i.e. by the end of calendar year 2019, majority of operators would move to packet switched technologies and the cost of terminating the calls would be so small that there would be no need to fix the termination charge and it will virtually amount to BAK. After analyzing the effect of on-net and off-net tariff policies followed by various Telecom Service Providers (TSPs), the Authority also noted that the BAK regime will reduce the inter-operator off-net traffic imbalance, and thus could help in convergence to an equilibrium situation.
- 1.6. Accordingly, in the Explanatory Memorandum (EM) annexed to the IUC Regulations, 2017 dated 19.09.2017, the Authority noted that it shall keep a close watch on the developments in the sector, particularly with respect to the adoption of new technologies and their impact on termination costs. The Authority, if it deems necessary, may revisit the afore-mentioned scheme for termination charge applicable on wireless to wireless calls after one year from the date of implementation of the Regulations.
- 1.7. In view of the above, the Authority has been closely monitoring the adoption of new technologies and imbalance in the inter-operator off-net traffic over a period of last two years. From time to time, during the last two years, the Authority collected the data relating to inter-operator off-net traffic and technology-wise call volume handled, from operators. The analysis of this data indicates that while the adoption of new technologies by service providers and customers is progressing, a large number of customers are still served by circuit switched networks for handling of

voice calls. Further, though the imbalance in the inter-operator off-net traffic is reducing over a period, it still exists.

1.8. In the meantime, the Authority has received representations from some stakeholders about revision of the existing IUC regime. These stakeholders through their representations have argued that the assumptions made in the EM annexed to the IUC Regulations of 2017 for introducing BAK from 1.1.2020 are at variance with the actual position on the ground. As per them, during the last two years, while the TSPs have done significant investments in the 4G networks, the same has not resulted in migration of all their customers to VoLTE and balancing of off-net traffic between all operators.

B. The Present Consultation Paper

1.9. In this background, the present Consultation Paper (CP) embarks on the review of the date of applicability of BAK regime in respect of wireless to wireless terminating calls. Chapter - II of the CP deals with the developments in the sector after last review and issues relating to domestic termination charges. Finally, Chapter - III lists the issues for consultation.

Chapter - II

Domestic Termination Charges

A. Regimes for retail charging of telecommunication services

- 2.1. For retail charging of telecommunication services, there are predominantly two regimes as outlined below:
- (i) **Receiving Party Pays (RPP) Regime:** Under RPP, the called party also pays for the call.
 - (ii) **Calling Party Pays (CPP) Regime:** Under CPP, the calling party pays to his/her service provider for the call, while the called party does not have to pay for the call.
- 2.2. In CPP regime, either of the following two regimes can be used for wholesale settlement between TSPs:
- (i) Calling-Party-Network-Pays (CPNP) regime
 - (ii) Bill-and-Keep (BAK) regime

B. Interconnection usage charges (IUC)

- 2.3. Interconnection Usage Charges (IUC) are wholesale charges payable by a Telecom Service Provider (TSP) to another Telecom Service Provider (TSP) for origination, transiting, or termination of the calls. The IUC mainly consists of origination, termination, carriage, and transit charges. This consultation paper is focusing on termination charges only. Different types of termination charges for voice calls are as follows:

(1) Domestic Termination Charges

- 2.4. These are the charges payable by the originating service provider to the terminating service provider for terminating the local or national long-distance calls successfully in its network. Depending upon the type of terminating network, these charges are referred to as either "Mobile Termination Charges" (MTC) or "Fixed Termination Charges" (FTC).

(2) International Termination Charge

- 2.5. International termination charges are the charges payable by an International Long Distance Operator (ILDO), which is carrying calls from outside the country, to the access provider in the country in whose network the call terminates.

C. Prevailing IUC Regulations for Voice Call Termination Charges

2.6. After following the due consultation process, the Authority issued the IUC Regulations, 2017, after which, the termination charges for Local and National Long Distance calls are prescribed as below:

Table: Termination Charges

Type of call	Type of traffic	Termination charge
Local and National Long-Distance call	Wireless to wireless	(a) Re. 0.06 (paise six only) per minute with effect from the 1 st October 2017 to the 31 st December, 2019; and (b) 0 (Zero) with effect from the 1 st January 2020
	Wireless to wireline	0 (Zero)
	Wireline to wireline	0 (Zero)
	Wireline to wireless	0 (Zero)

* Wireless means full mobility, limited mobility and fixed wireless access services.

2.7. Accordingly, as per the IUC Regulations, 2017, Bill And Keep (BAK) regime i.e. zero termination charge for all type of domestic calls shall be implemented from 01.01.2020.

2.8. It is pertinent to mention here that the termination charges for wireless to wireless Local and NLD calls, applicable presently i.e. Re. 0.06 (paise six only) per minute, were fixed by the Authority after exhaustive consultation with stakeholders and based on costs involved in terminating the calls.

2.9. While reaching the conclusion relating to BAK regime (zero termination charge) from 01.01.2020, the Authority, in Explanatory Memorandum (EM) to the IUC Regulations, 2017 dated 19.09.2017, reasoned that approximately after 2 years from the date of notification of the these regulations i.e. by the end of calendar year 2019, most of operators would move to packet switched technologies and majority of the calls would terminate on the packet switched networks then the cost of terminating the calls would drastically come down over a period of time of two years and very small residual values, if any, can be absorbed by the TSPs in

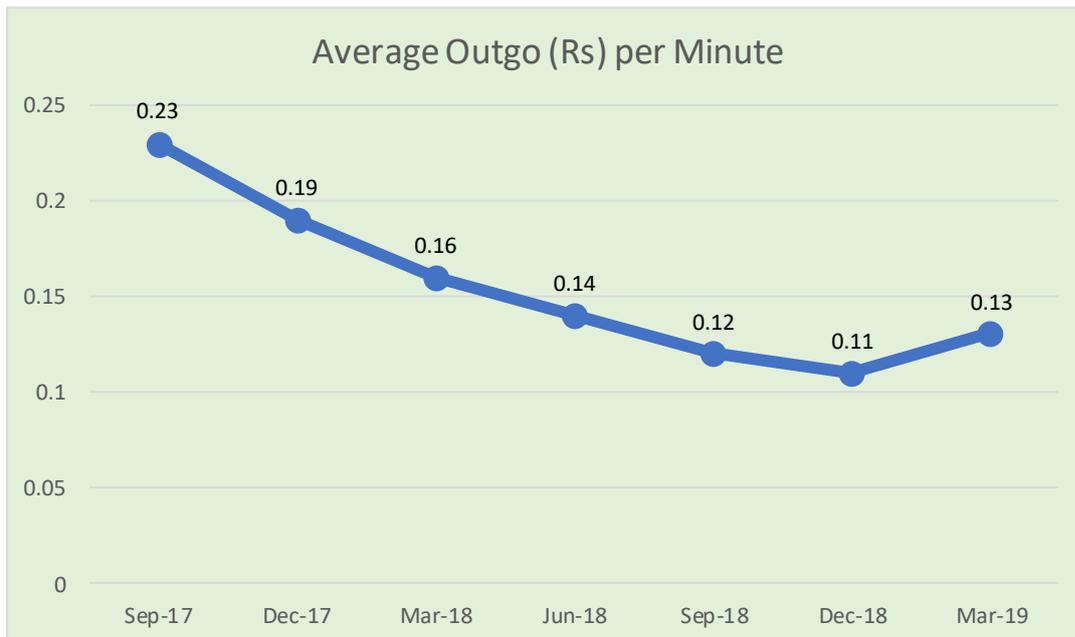
their tariff offerings. After analysing the effect of on-net and off-net tariff policies followed by various TSPs, the Authority also noted that the BAK regime will reduce the inter-operator off-net traffic imbalance, and thus could help in convergence to an equilibrium situation.

2.10. In Explanatory Memorandum (EM) to the IUC Regulations, 2017, the Authority further noted "The Authority shall keep a close watch on the developments in the sector particularly with respect to the adoption of new technologies and their impact on termination costs. The Authority, if it deems necessary, may revisit the afore-mentioned scheme for termination charge applicable on wireless to wireless calls after one year from the date of implementation of the Regulations".

D. Developments after the notification of IUC Regulations, 2017

2.11. As recognised by the Authority in the EM to IUC Regulations, 2017, the suitable time for implementation of the BAK regime would depend upon the adoption of the new technologies by service providers as well as customers and/ or balancing of the inter-operator off-net traffic. Now, while revisiting the issue, based on the actual developments during the last two years, it needs to be decided as to whether the date 1.1.2020, earlier fixed for implementing BAK regime (zero termination charge), through IUC Regulations 2017, still holds or it requires reconsideration.

2.12. The introduction of new regime for termination charges has brought about changes in the tariff plans of the service providers. One of the very significant developments has been the introduction of flat rate charging by the service providers in different plans. This has given ample options to the subscribers in choosing the tariff plans. Further, the average outgo per minute, which was at ₹ 0.23 per minute, at the end of September 2017, has come down to ₹ 0.13 per minute, at the end of March 2019 (Refer graph below).

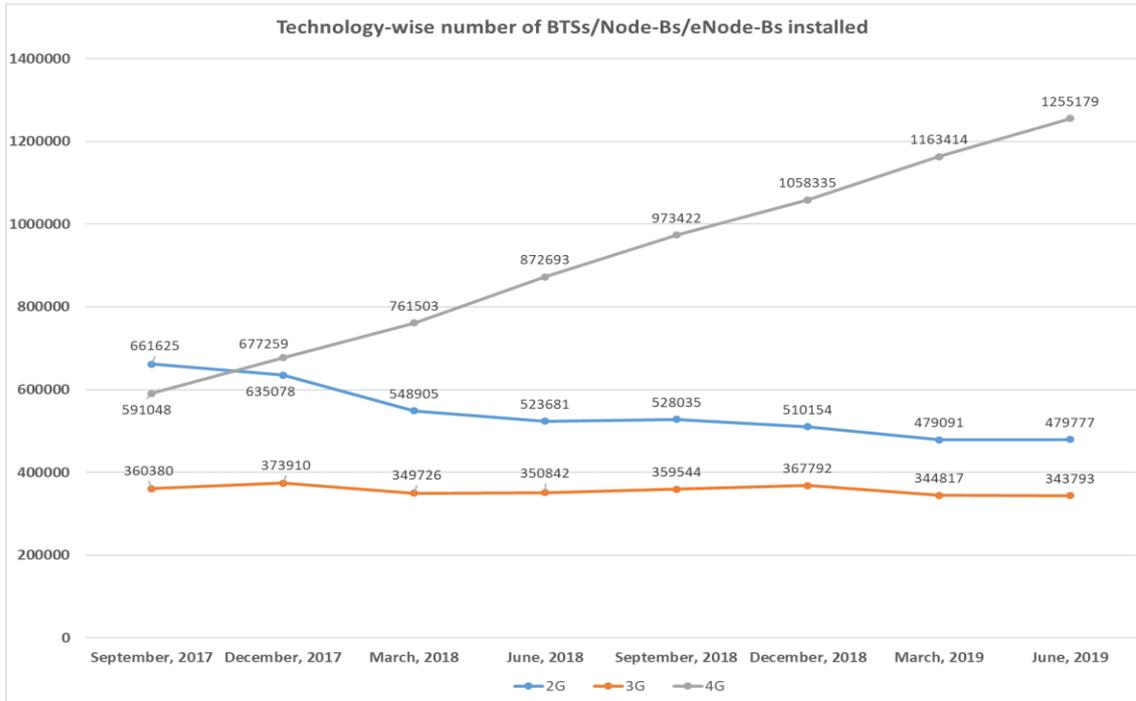


Source: Performance Monitoring Reports of TRAI

Figure- 1

2.13. After consolidation in the sector during last few years, wireless access services are now being delivered, primarily by two public sector and three private sector TSPs. While, as of now, the Public sector TSPs have negligible presence in providing 4G services, all three-private sector TSPs are providing the 4G services. In terms of subscribers in the wireless access services market, private TSPs have more than 90% market share.

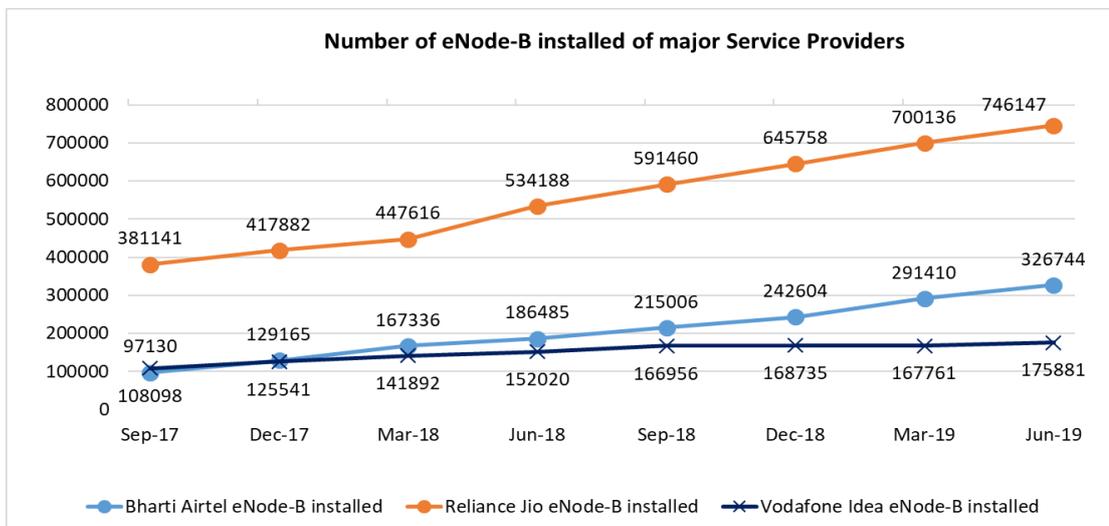
2.14. In terms of number of Base Transceiver Stations, during the last two years the cellular mobile networks have grown swiftly. From the data made available by TSPs, at the telecommunication services sector level, during the last two years, it has been observed that while the number of eNode-Bs i.e. 4G Base Transceiver Stations have more than doubled, the Node-Bs i.e. 3G Base Transceiver Stations have remained almost stagnant. Simultaneously, 2G BTSs have seen continuous decline. A graph depicting the technology wise number of BTSs/ Node-Bs/ eNode-Bs deployed by all TSPs in total is given in Figure-2. It indicates that the TSPs are adopting packet-based technologies in the network.



Source: As reported by TSPs to TRAI

Figure- 2

2.15. As stated in para 2.13 above, presently, 4G wireless access services in the country are primarily being provided by three largest TSPs only. While it is a fact that at aggregate level, the TSPs are adopting packet-based technologies in the network and footprint of 4G networks is increasing, it is also a fact that not all operators are expanding their 4G Radio Access Networks (RANs) at same pace. A graph depicting the operator wise number of eNode-Bs deployment is given in Figure-3 below.



Source: As reported by TSPs to TRAI

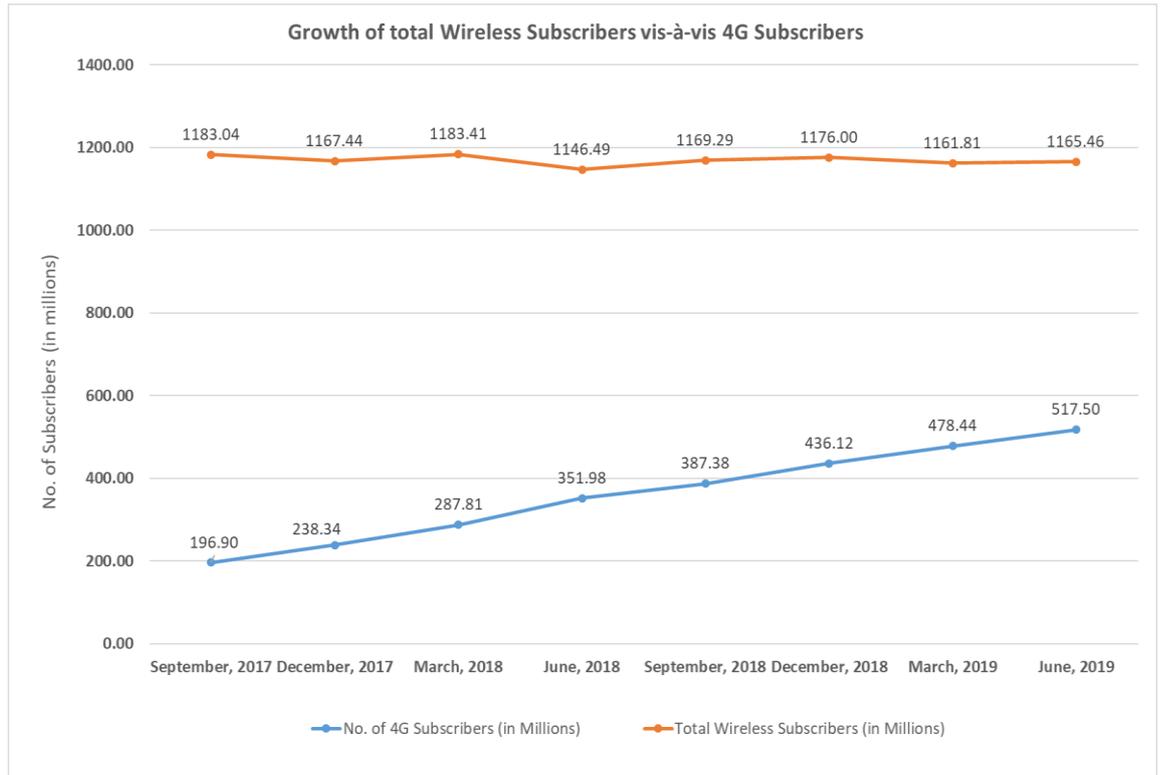
Figure- 3

2.16. Further, the proportion of 4G capable smartphones and feature-phones has continuously increased in the Indian telecommunication market. According to the International Data Corporation's (IDC) Quarterly Mobile Phone Tracker¹, a total of 69.3 million mobile phones were shipped to India in the June 2019 quarter. Out of these, smartphone and feature phone market share were 36.9 and 32.4 million units respectively. In the last quarter ending June 2019 also, while the smartphone market has grown, the feature phone market has continued to decline. This trend indicates that the Indian telecommunication services consumers are progressively moving towards adoption of latest technologies. However, the change is gradual and is likely to take some more time before most of subscribers would start using 4G capable devices.

2.17. In terms of subscribers, while the number of wireless subscribers has remained practically static during the last two years, the share of the 4G data subscribers has continuously increased. At the end of June 2019, number of 4G data subscribers increased to 517.5 Million. Depending upon the type of mobile phone they use, out of these 517.5 Million subscribers, many are capable of receiving the voice call over the packet switched networks. As per Nokia MBit Index Report 2019², at the end of calendar year 2018, in India, of the total LTE capable device base, 83% devices are VoLTE capable. A graph depicting the total wireless subscribers and 4G data subscribers over a period of last two years is given in Figure-4. This trend also indicates that the share of 4G data subscribers in total wireless subscribers has grown rapidly. It now stands at approximately 45% of total wireless subscription.

¹ <https://www.idc.com/getdoc.jsp?containerId=prAP45442419>

² http://bestmediainfo.in/mailler/nl/nl/Nokia_MBiT_2019_FINAL.pdf

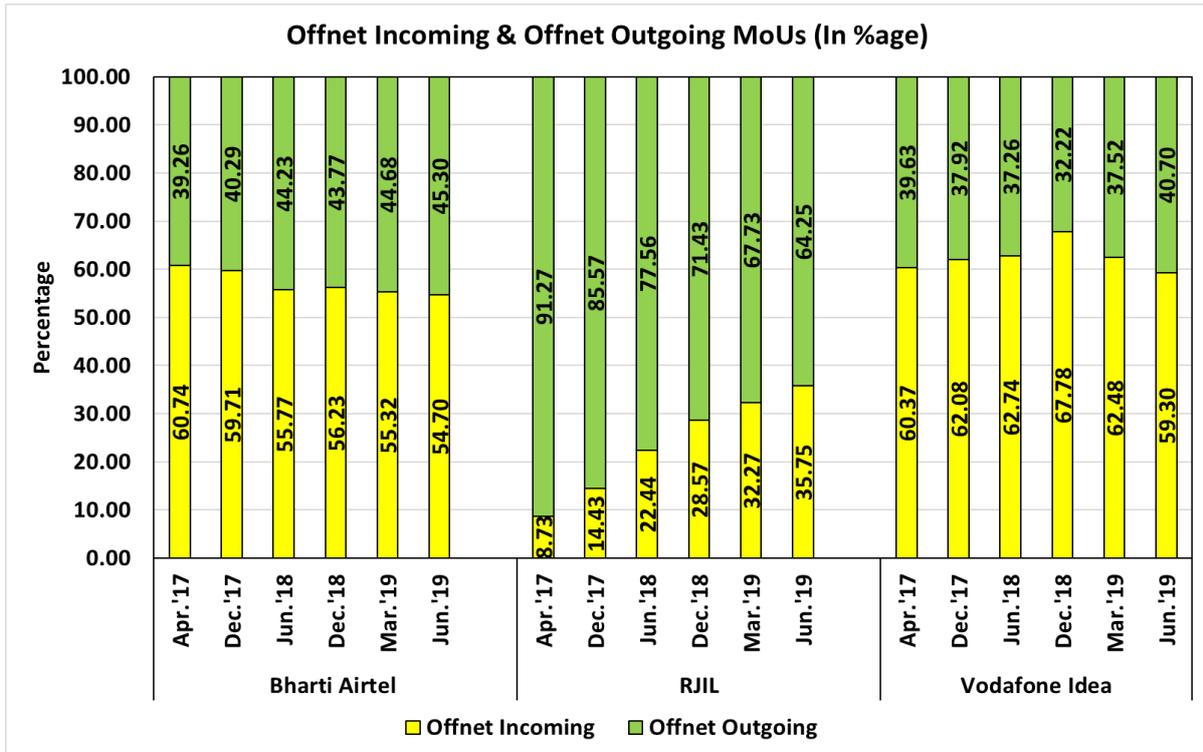


Source: TRAI

Figure- 4

2.18. For the purpose of termination charges, the adoption of new technologies by customers can also be assessed by monitoring the share of voice call traffic handled on various technologies i.e. 2G, 3G, and 4G RANs. While the voice call traffic in public sector TSPs networks is largely handled on 2G and 3G RANs, the voice call traffic for one private sector TSP is fully handled on 4G RANs as this TSP does not have 2G or 3G RANs. In case of remaining two private TSPs, as per data made available by them, in terms of voice minutes, only 5% and 18% of their total voice call traffic is being handled on 4G RANs, as of now.

2.19. While monitoring the imbalance in inter-operator off-net terminating voice call traffic, over a period of last two years, it has been observed that the imbalance is gradually reducing. A graph depicting the imbalance in incoming and outgoing off-net terminating voice call traffic, amongst the top three TSPs in terms of market share, is given in Figure-5:

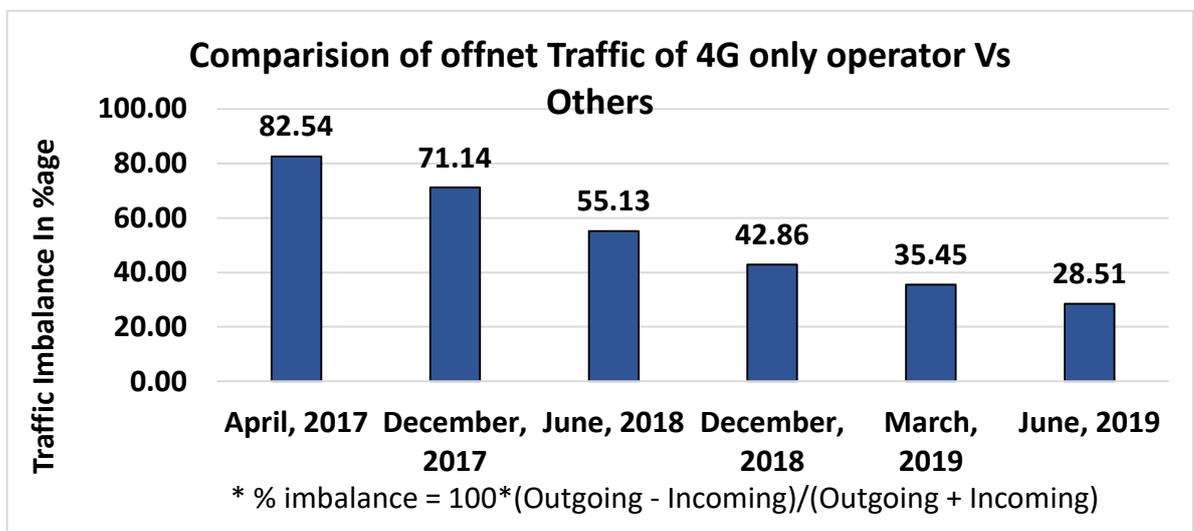


Source: As reported by TSPs to TRAI

Figure- 5

2.20. An analysis of the graph above reveals that the difference between incoming and outgoing off-net minutes of all the service providers is reducing.

2.21. The Authority has done further analysis of traffic imbalance and has noted that the large initial imbalance between the only 4G operator and other operators is reducing, as can be viewed in Figure- 6.



Source: As reported by TSPs to TRAI

Figure- 6

- 2.22. In fact, as per the data made available by TSPs, traffic imbalance in terms of absolute minutes between an only 4G operator and other operators has also reduced from peak of approximately 60 Billion minutes per month in December 2017 to 40 Billion minutes per month in June 2019.
- 2.23. In view of above-mentioned developments in the telecommunication services sector after the notification of IUC Regulations, 2017, the trends indicate that while the adoption of new technologies by service providers and customers is progressing, still many of the calls are getting terminated on the circuit switched networks. Further, over a period, though the imbalance in the inter-operator off-net traffic is reducing, it still exists. It is also pertinent to mention here that maximization of consumer welfare (i.e. adequate choice, affordable tariff, and good quality of service) in a sustainable manner and adoption of more efficient technologies are vital for orderly growth of the telecommunication services sector in the country.
- 2.24. Considering the facts mentioned above, the stakeholder's comments are invited about implementation of BAK regime i.e. zero termination charge from 1.1.2020.

Chapter-IV

Issues for Consultation

In view of the above-mentioned developments in the telecommunication services sector during the last two years, following is the list of issues for consultation. It may please be noted that comments to the issues given below should be supported with reasons, justification, and relevant data.

Q1: Is there a need to revise the applicable date for Bill And Keep (BAK) regime i.e. zero mobile termination charge from 01.01.2020? If yes, then what parameters should be adopted to decide the alternate date? Give your suggestions with justification.

Q2: Any other issue related with the domestic wireless termination charges.

Acronyms

S. No.	Acronym	Description
1	2G	2nd Generation
2	3G	3rd Generation
3	4G	4th Generation
4	BAK	Bill and Keep
5	CP	Consultation Paper
6	CPNP	Calling Party Network Pays
7	CPP	Calling Party Pays
8	CS	Circuit Switched
9	IUC	Interconnection Usage Charge
10	LTE	Long Term Evolution
11	MTC	Mobile Termination Charge
12	NLD	National Long Distance
13	PS	Packet Switched
14	RAN	Radio Access Network
15	RPP	Receiving Party Pays
16	TRAI	Telecom Regulatory Authority of India
17	TSP	Telecom Service Provider
18	VoLTE	Voice over LTE