

STATISTICS FROM THE TELECOMMUNICATIONS SECTOR COSTA RICA 2017

384.6

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PRESENTATION

The General Superintendence of Telecommunications (SUTEL) is pleased to present the sixth edition of its “Statistics from the telecommunications sector” for the year 2017. This publication is the result of the commitment of the regulating institution to the Costa Rican society regarding the monitoring of the performance of the telecommunications market.

The information compiled, year after year, from the data submitted by operators and sector providers (through the System of Indicators of Telecommunications, SITEL), the results of drive test type quality measurements and the surveys applied to samples of users, turn into a fundamental tool for regulatory decisions related to the telecommunications market, where quality, preferences and likings of the users are tracking variables. This information also becomes a parameter that determines the position of Costa Rican within the indicators of the sector at the international level.

This publication is divided in the following sections:

- 1. Methodology and scope of the report:** it describes how the data is compiled, reviewed and analyzed for the generator of indicators as well as their scope.
- 2. General evolution of the sector:** shows the behavior registered in the telecommunications market in 2017 with regards to income, investment, human resource and subscriptions to the different services and general statistics of the National Telecommunications Fund (FONATEL).
- 3. Fixed telephony:** addresses indicators related to subscription, penetration traffic and income to the subservices of traditional telephony and VoIP.
- 4. Mobile telephony:** analyzes indicators of subscriptions, penetration, traffic, income and portability in this market, segregating the information by modality of payment.
- 5. Data transfer:** describes the performance of the mobile Internet service, fixed and dedicated lines through the utilization of indicators related to subscriptions, traffic

and income, and it groups the information by type of technology and speed.

- 6. Paid television:** indicators of subscriptions and income associated by type of technology.
- 7. Commercial offers and prices:** it compares commercial offers for the services of mobile telephony and fixed Internet introduced in 2017. It includes an analysis of prices for the different services and includes a telecommunications price index created by SUTEL.
- 8. Quality and performance of networks:** it describes the results of the annual technical evaluations of quality service performed by SUTEL and it additionally introduces the results of the perception surveys and level of quality satisfaction of telecommunications services, as well as the results obtained in the performance of mobile networks through the tool OpenSignal.
- 9. FONATEL:** it describes the results of the operating indicators for each of the programmes of the fund, in addition to the perception of a sample of beneficiaries about use and utilization of the programme funds.
- 10. International:** it analyses the position of Costa Rica within the international context regarding the development of telecommunications; it analysis the behavior of the different services internationally and the possible trends in such behavior in the near future.
- 11. Statistical Annex:** compendium of statistical tables that complement the reading of data.
- 12. Acronyms:** it includes the definition of the different acronyms and technical terms found throughout the document.

With this publication SUTEL aims to provide relevant information which let users take appropriate decisions in the acquisition and consumption of telecommunications services in an era where the digital economy is predominant.



It is important to highlight the institutional effort, with the inclusion for the first time of data about the different programmes of FONATEL whose final objective is the reduction of the digital gap and the promotion of the access and universal service of telecommunications.

The data compiled this year shows that the services of mobile telephony and paid television in Costa Rica have reached their level of maturity from the perspective of subscription, penetration, and diversification of the technologies used and promotions.

On the other hand, data transfer continues being the service with continuous growth. This responds to the usage in the everyday life of the user (communications, entertainment, information, among others) and profiles the type of consumer in the country, while fixed telephony decreases as a result of the offer of substitute services.

As far as technologies via Internet, these increase their share in the market (VoIP telephony and paid subscription over IP and multichannel) as well as the usage of fiber optic for the case of fixed Internet services, evidencing the trend in the application of modern technologies.

There is no question about the evolution of the country since the signature of the General Law of Telecommunications N°8642 issued in 2008. The promulgation of this law has generated a market that is accessible, diverse and competitive, that contributes to the economic and social development of a country that is engaged in a globalized digital economy and, furthermore, allows the identification of a consumer profile more and more inclined to using Internet and thus, the consumption of data as their preferred choice.

We thank those who collaborated throughout the different states of this document. A special recognition to the employees at SUTEL for their commitment and dedication to completing a job that demanded high levels of coordination and effort in a short term.

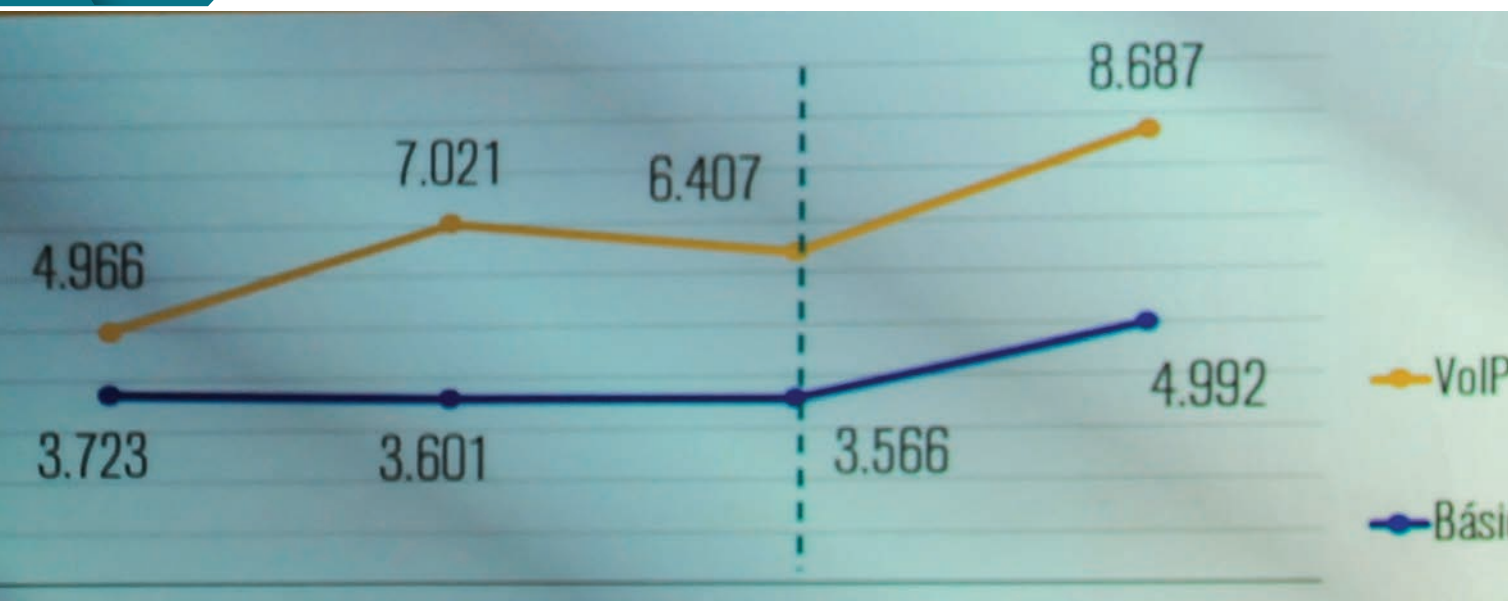
Today, SUTEL has the first edition of indicators in a comprehensive manner, so that readers may have data about the market and the quality of telecommunications services as well as data about the scope of FONATEL's projects.

Lastly, we dedicate this publication to the former congressmen, President of the Republic, Ministers and Vice Ministers of the Direction of Telecommunications, and to former regulators of SUTEL that promoted all those changes. All of them are part of this legacy. The results evidence that the country challenge has been largely outdone.

Hannia Vega,
President of the Council, SUTEL



METHODOLOGY AND SERVICES DESCRIPTION



METHODOLOGY AND SERVICES DESCRIPTIONS

This report, for the most part, is generated with information from a primary source, either through the collection of data sent to SUTEL by operators and service providers, or summarized in the field through surveys or direct measurements.

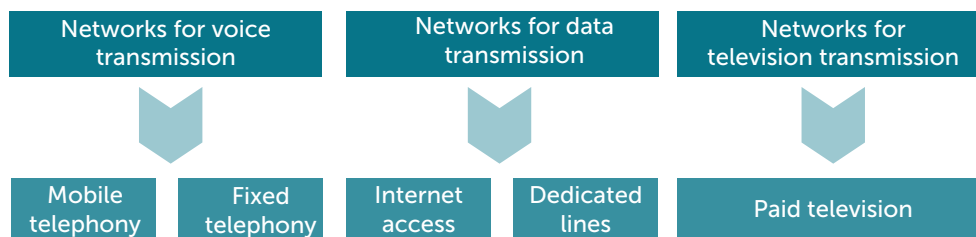
Description of the telecommunication services included in this report

In order to standardize and simplify the approaches to compile market information provided by service suppliers and network operators, we have divided telecommunications services available to the public into the network deployed and the type of signal they carry.

Considering the above, telecommunications services contemplated in this publication are

classified into three categories: voice, data transfer and paid television services, that are analyzed based on the information compiled, whether referring to the general performance of the sector, the quality of the services offered in the market or the level of provisioning and coverage reached by the different FONATEL projects. This classification and the sub-groups included in each case are illustrated in figure N° 1.

Figure N° 1
Costa Rica. General classification of services



Source: SUTEL, General Directorate for Markets.

The services provided via networks for voice transmission include the following:

- **Mobile telephony services:** offers the users two subscription modalities: pre-paid and post-paid.
- **Fixed telephony services:** this service is defined in article 3° of the Regulations on the Regime of Protection to the Final User of Telecommunications Services. For the purpose of this report, it is divided into three different types of service provision: traditional basic telephony, IP or VoIP telephony and public telephony. As provided by article 3 of the regulations mentioned above, the provision of fixed telephony services includes any means of access as long as the terminals associated do not allow for mobility. The follow up to these services is done by assessing the evolution of the income, the number of subscribers and voice traffic in the network.

Regarding data transfer services, it is defined in article 8o, section 75 of the Regulation for the Provision and Quality of the Services; and, for this publication, a sub analysis is performed by sub-dividing this service into two markets:

- **Service of internet access**

- **Service of dedicated lines**

Finally, though television content is not considered a telecommunications service, it includes networks for television transmission as some of this operate via the Internet. This chapter includes:

- **Paid television:** satellite t.v., cable t.v., IP television, and multipoint television.

Next, a detail of the types of commercialization and characteristics of the networks that support each one of the services comprised in these 3 groups:

Table N° 1
Costa Rica. Telecommunication services considered in the study

| Category of telecommunications service | Types of commercialization | Characteristics of the networks that support it |
|--|---|---|
| Mobile telephony | Instant messaging (SMS), Multimedia messaging (MMS), Voice post-paid, voice pre-paid | Facilitates communications of voice over wireless means in the access, allows sending and downloading data through the air interface. Its evolution is aiming towards an all-IP architecture |
| Fixed telephony | Traditional basic telephony, voice over IP (VoIP), RDSI. | Known as PSTN, it uses a set of exchange switches and panel links to establish temporary connections between two extremes, which is known as circuit commuting. Additionally, with the implementation of a soft switch and other active elements, the PSTN network can be interconnected with any data network and provide voice over IP. |
| Paid television | Satellite television, cable television, IP television and MMDS television | The service is provided through different technologies, it can be a satellite system or a cable system based on DOCSIS 2.0 or higher. It can transmit data and, because of this, although paid television is not a telecommunications service, it might be interesting to analyze its evolution. |
| Data transfer | Access to Internet, international carrier, mobile data, dedicated lines | Communications are achieved by generating packages of Information that are resent through the network, regardless of the propagation means or the network used. It is based on two techniques: datagram routing and virtual channels. |

Source: SUTEL, General Directorate for Markets.

Methodology

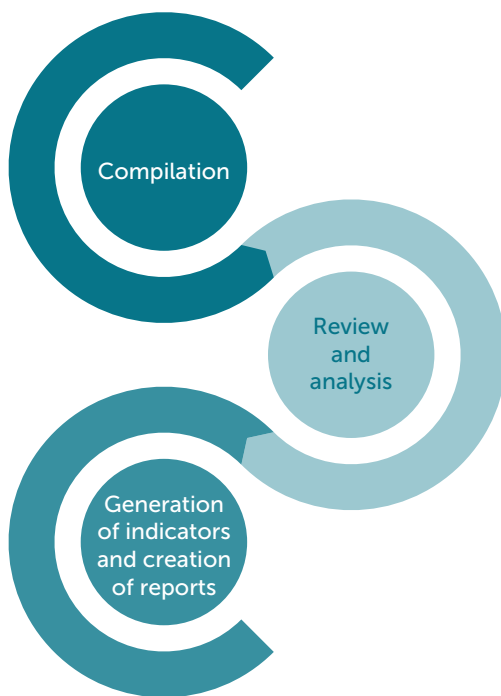
The tasks related to the General Directorates of Markets, Quality and FONATEL were consolidated into the methodologies applied to each area for the generation of 2017 performance indicators for the Costa Rican telecommunications sector from the perspectives of the indicators of general evolution of the market, quality of the services, execution of FONATEL's programs and projects, among others.

Methodology applies to the indicators of market behavior

In the case of the indicators of behavior of the telecommunications market (chapter General Evolution of the Sector, page 41), the following analysis of information was conducted in three different phases: compilation of information, its review and analysis and generation of results.

The following Tables synthesize the main tasks performed in each of these stages.

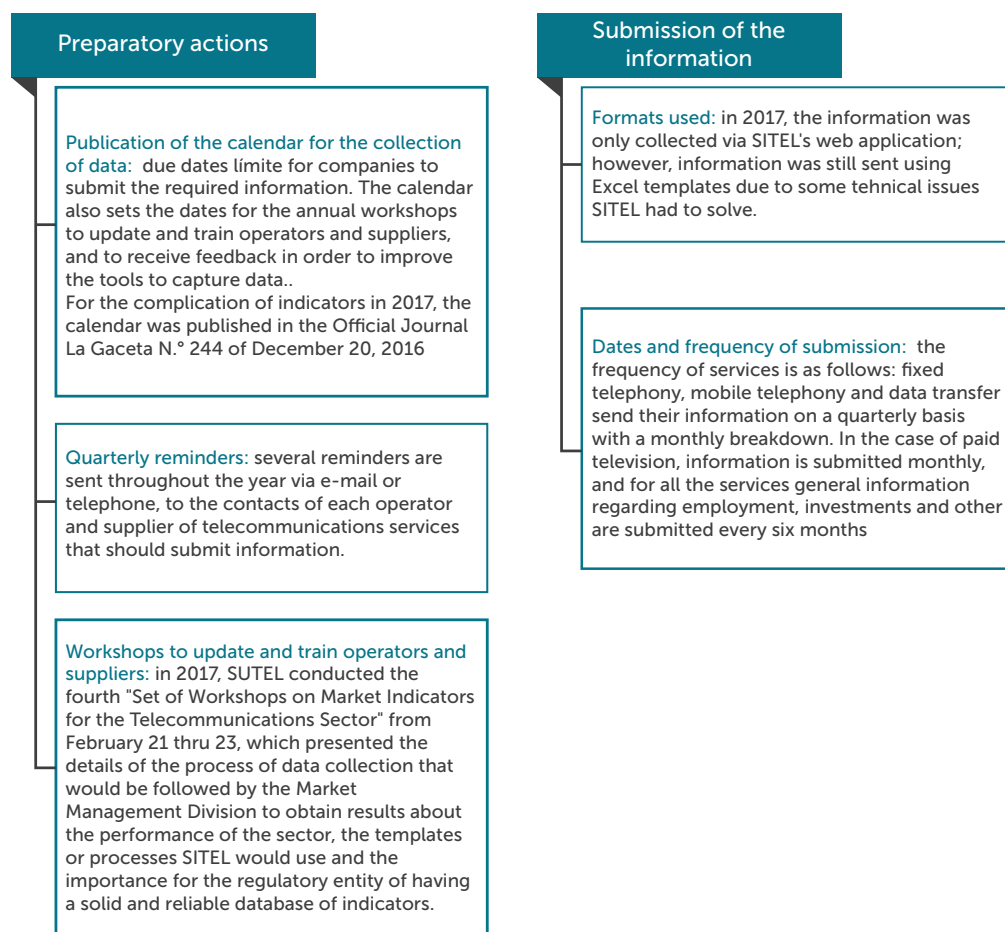
Figure N° 2
Costa Rica. Process of compilation, review and analysis and generation of the indicators of the telecommunications sector.



Source: SUTEL, General Directorate for Markets.

- **Compilation of information**

Figure N° 3
Costa Rica. Process of compilation of information for the construction of the indicators of the telecommunications sector



Source: SUTEL, General Directorate for Markets.

It is important to mention that in 2017, in the case of the indicator of monitoring or the market of telecommunications, these were collected only digitally thru the System of Indicators of the Telecommunications sector (SITEL) and this facilitated the process of data reporting for operators and data processing for reports.

Regarding the workshops to update and train operators and suppliers of telecommunications services, 82 representatives of operators and telecommunications service providers attended in 2017, corresponding to 57 operators with an active commercial offer.

Table N° 2
Costa Rica. Telecommunications Superintendence: Attendance to the
Workshops on Indicators for the Telecommunications Market, 2017

| Date | Service | Operator | Representative |
|-----------|--|---|----------------|
| 2/21/2017 | Fixed telephony (Basic tradicional and VoIP) | Instituto Costarricense de Electricidad | 3 |
| 2/21/2017 | Fixed telephony (VoIP) | American Data Networks | 1 |
| | | Call My Way S.A. | 1 |
| | | Claro CR Telecomunicaciones, S.A. | 2 |
| | | Conecta Developments Sociedad Anónima | 1 |
| | | E-diay S.A. | 1 |
| | | Interphone S.A. | 1 |
| | | P.R.D. Internacional, S.A. | 1 |
| | | Radiográfica Costarricense S.A. (RACSA) | 2 |
| | | Telecable Económico T.V.E. S.A. | 3 |
| | | Telefónica de Costa Rica TC S.A. (Movistar) | 2 |
| | | Televisora de Costa Rica S.A. (Cable Tica, Tuyo Mobile) | 1 |
| | | Servicios Integrados Corporativos Limitada | 2 |
| | | Millicom Cable Costa Rica, S.A. (TIGO) | 4 |
| | | Transdatelecom S.A. | 2 |
| Total | | | 27 |
| 2/22/2017 | Mobile telephony | Instituto Costarricense de Electricidad | 2 |
| | | Radiográfica Costarricense S.A. (RACSA) | 2 |
| | | Telefónica de Costa Rica TC S.A. (Movistar) | 1 |
| | | Televisora de Costa Rica S.A. (Cable Tica, Tuyo Mobile) | 1 |
| | | Claro CR Telecomunicaciones, S.A. | 2 |
| Total | | | 8 |
| 22/2/2017 | Paid television | Servicios Femaroca T.V. Sociedad Anónima | 1 |
| | | Cable Visión de Costa Rica CVCR, S.A. | 4 |
| | | Cable Zarcero S.A (Mega Cable) | 1 |
| | | Cable Talamanca S.A. | 1 |
| | | Cooperativa de Electrificación Rural de Guanacaste R.L. | 1 |
| | | Cooperativa de Electrificación Rural de San Carlos R.L. (Coopelesca R.L.) | 1 |
| | | P.R.D. Internacional, S.A. | 1 |
| | | Millicom Cable Costa Rica, S.A. (TIGO) | 2 |
| | | Transdatelecom S.A. | 1 |
| Total | | | 13 |

| Fecha | Servicio | Operador | Representante |
|---------------|--|--|---------------|
| 23/2/2017 | Data transfer (Internet access and dedicated lines) and general | American Data Networks | 1 |
| | | Holst Van Patten, S.A. | 1 |
| | | BT LATAM Costa Rica | 2 |
| | | Columbus Networks de Costa Rica S.R.L. | 1 |
| | | Televisora de Costa Rica S.A. (Cable Tica, Tuyo Móvil) | 1 |
| | | Cable Visión de Costa Rica CVCR, S.A. | 1 |
| | | Call My Way S.A. | 1 |
| | | Conecta Developments Sociedad Anónima | 1 |
| | | Cooperativa de Electrificación Rural de San Carlos R.L. (Coopelesca R.L.) | 1 |
| | | Empresa de Servicios Públicos de Heredia (ESPH) | 1 |
| | | Instituto Costarricense de Electricidad | 3 |
| | | Inasol Inalámbrica Soluciones S.A. | 1 |
| | | Junta Administrativa del Servicio Eléctrico de Cartago (JASEC) | 3 |
| | | LUMINET CR | 1 |
| | | Radiográfica Costarricense S.A. (RACSA) | 1 |
| | | Redes Integradas Corporativas Limitada | 1 |
| | | RSL TELECOM (PANAMA) S.A. | 2 |
| | | Sistemas de RED CMM E.I.R.L. | 2 |
| | | Telecable Económico T.V.E. S.A. | 2 |
| | | Servicios Integrados Corporativos Limitada | 2 |
| | | Millicom Cable Costa Rica, S.A. (TIGO) | 2 |
| | | Ufinet Costa Rica S.A. | 2 |
| | | Wizard Communications S.A. | 1 |
| Total | | | 34 |
| Overall Total | | | 82 |

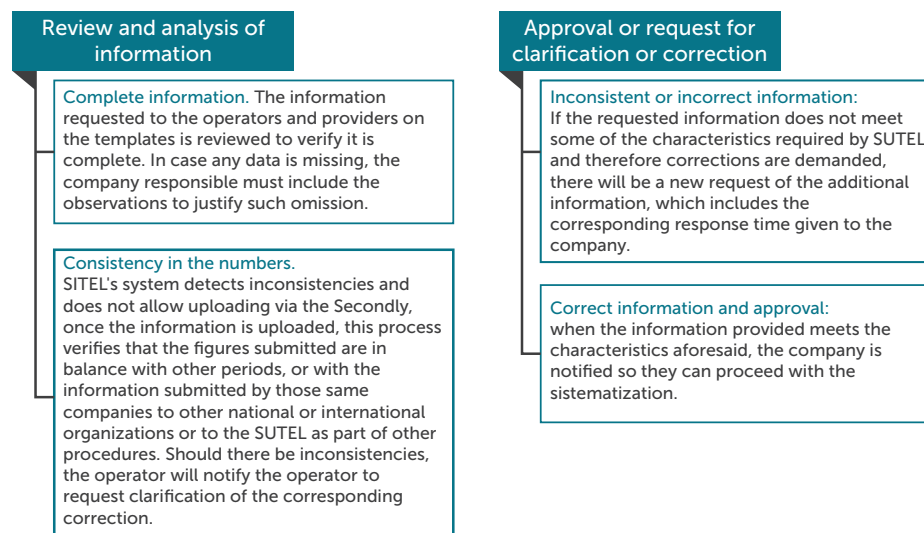
Source: SUTEL, General Directorate for Markets.

• Review and analysis of information

Once the information is received, it is reviewed and carefully analyzed by the professionals of the team of the Market Management Division (MMD). The actions carried out as a result of this general verification include the determination of the consistency in the time of the information and the reporting of complete data; if needed, clarifications or corrections are required from those involved.

It is important to mention that since a new method to report and upload the information was used in 2017, an additional filter was added to the process of review; this includes rules of validation embedded that will avoid including information that is not consistent with what has been historically reported. For example, these rules avoid uploading to the information system different units to those reported previously (thousands or millions of Colones, Kbps or MB), among others.

Figure N° 4
Costa Rica. Process to review and analyze the information for the construction of indicators for the telecommunications sector



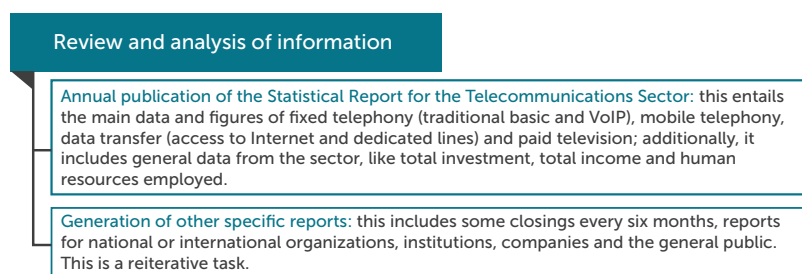
Source: SUTEL, General Directorate for Markets.

It is important to note that in addition to the tasks of review, there are meetings with different operators throughout the year to clarify indicators required on the templates and share the observations provided by this Superintendence regarding the data they provided.

• Generation of results

This activity corresponds to the stage of generation of reports with the information provided by the operators of networks and the suppliers of telecommunication services, as well as with the information compiled from secondary national or international sources (INEC, UTI, World Economic Forum, etc.)

Figure N° 5
Costa Rica. Process of generation of results and final creation of the indicators of the telecommunications sector



Source: SUTEL, General Directorate for Markets.

Summary of Indicators of Market Behavior Presented.

The general definitions for each indicator of market behaviors are presented with the purpose of bringing clarity to the reader about the information processed.

Table N° 3
Costa Rica. Indicators of the service of fixed telephony, 2017

| Indicator | Definition |
|--|---|
| Total active fixed telephony lines | Total number of lines in service and duly allocated to a customer, which are not in definite suspension of the service (articles 12 and 34 of the RPUF) and which present at least one ratable event during the last rating month or that has a valid service provision contract with the operator. |
| Subscriptions/active VoIP lines | Number of active subscriptions to fixed lines that use the protocol of voice over Internet transmission (VoIP). It only includes the total number of subscriptions to the VoIP service that have generated inbound and outbound traffic during the last Three months. It excludes VoIP applications software (for example, VoIP from Skype between computers and from a computer to a telephone). |
| Subscription to RDSI, BRI and PRI services | Total number of subscriptions of the Digital Network of Integrated Services (DNIS) that may be separated into service of basic speed interface (BRI) and primary speed (PRI) |
| Total traffic in traditional basic telephony | Traffic that corresponds to the calls made through the analogue lines, digital or both. |
| Total VoIP traffic | Traffic that corresponds to the calls made through fixed managed VoIP telephony (protocol of voice transmission over Internet). |
| Inbound international telephone traffic | Traffic total with international origin and fixed on net destination. |
| Outbound international telephone traffic | Total traffic with fixed on net origin and international destination. |
| Total income in basic traditional telephony (retail) | This refers to the income from basic rate + excess + other line items associated to the provision of the fixed telephony service. |
| Total income VoIP (retail) | This indicator is equivalent to the income associated to basic rate + excess + other line items associated to the provision of the VoIP. |

Source: SUTEL, General Directorate for Markets.

Table N° 4
Costa Rica. Indicators of the data transfer service, 2017

| Indicator | Definition |
|--|--|
| Active Internet Subscriptions fixed wired | Sum of the active subscriptions to the service that provides access to fixed wired Internet (cable modem, xDSL, fiber, home or building and other fixed wired technologies) |
| Active subscriptions to fixed wired internet | Sum of the active subscriptions to the service that provides access to fixed wireless Internet (Satellite, fixed WiMax and other fixed wireless technologies). |
| Active subscriptions to mobile internet. | Sum of active subscriptions to the service that provides mobile Internet (pre-paid and post-paid cellular, Data Card, mobile WiMax and other mobile technologies). |
| Active subscriptions to telephone dial-up Internet. | Number of active subscriptions to telephone dial-up Internet. This service includes Internet connection via a modem and a fixed telephone line, where the modem dials a phone number when Internet Access is required. |
| Number of dedicated lines (dedicated links) | Number of dedicated private connections. A dedicated line connects two locations of the telecommunications service for voice or private data. These lines do not have a special cable, but a reserved circuit between two points. Usually, the enterprises rent these lines for the connection of their offices because they guarantee the necessary bandwidth for the traffic of the network. |
| Internet Traffic | Refers to the number of data transmitted and downloaded (in Gigabytes) by all the users of the Internet access service. Total income for the provision of dedicated lines Total amount of income billed for the provision of the dedicated |
| Total income for the provision of dedicated lines | Total amount of income invoiced for the provision of the dedicated lines service. |
| Maximum downloading speed offered | Maximum Internet speed offered to download data in the Internet access service. |
| Minimum downloading speed offered | Minimum Internet speed offered to download data in the Internet access service. |
| Total income invoiced for Access to fixed wired Internet | This corresponds to the total amount of income billed in association with the provision of fixed wired Internet services. |
| Total income billed for access to fixed wired Internet | This corresponds to the total amount of income billed in association with the provision of fixed wireless Internet services. |
| Total income invoiced for access to mobile Internet | This corresponds to the total amount of income invoiced in association with the provision of mobile Internet access services. |

Source: SUTEL, General Directorate for Markets.

Table N° 5
Costa Rica. Indicators of the mobile service, 2017

| Indicator | Definition |
|---|---|
| Active post-pay mobile subscription | Total number of subscriptions to post-paid mobile telephones that pay a monthly subscription rate and that present at least one ratable event during the rating month and are not in definite service suspension pursuant to articles 12 and 34 of the RPUF. |
| Active pre-pay mobile subscriptions | Total number of subscriptions to pre-paid mobile telephones that have at least one ratable event to the balance of the service within ninety calendars day before the last rating and that belong to the pre-pay platform. |
| Total capacity of mobile lines installed | Corresponds to the maximum number of mobile lines that can be connected. This number includes mobile lines already connected and mobile lines available for later connections, including those for technical use of the switch (test numbers). |
| Mobile traffic (voice, SMS and MMS) | Refers to the total traffic of the mobile telephony service. |
| Mobile traffic – fixed owned | Traffic originating in own mobile network (on net mobile) with destination on own fixed network (fixed network of the same operator). |
| <i>Mobile traffic on net</i> | Traffic with origin in mobile network with destination on the same mobile network (traffic on net). |
| Mobile traffic – other mobile networks | Traffic with origin in own mobile network (on net mobile) with destination on other mobile networks (mobile networks of other operators) |
| Traffic other mobile networks – own mobile | Traffic with origin in the mobile networks of other operators (off net mobile) with destination on own mobile network (on net mobile). |
| Traffic fixed own – mobile own | Traffic with origin in the own fixed network with destination own mobile network (on net mobile). |
| Traffic mobile – other fixed networks | Traffic with origin on the own mobile network (on net mobile) with other fixed networks (off net fixed) as destination |
| Traffic other fixed networks- own mobile | Traffic originated in fixed networks of other operations (fixed off net) with destination own mobile network (on net mobile). |
| Mobile traffic - international | Traffic originated in own mobile network (on net mobile) with international destination (off net international). |
| Traffic international networks – own mobile | Traffic with origin in international networks (off net international) with destination of own mobile network (on net mobile) |
| Mobile traffic in transit | Traffic with off net origin (other fixed network, mobile and international long distance,) with off net destination (other fixed networks, mobile and international long distance that transit thru one own mobile network. |
| Total mobile voice traffic per payment modality | This corresponds to the sum of mobile voice traffic according to payment modality (pre-paid and post-paid). To construct this indicator, it is necessary to add on net traffic plus outbound off net traffic. Total mobile voice traffic: Mobile voice traffic on net + mobile voice traffic off net total (mobile voice traffic outbound to other mobile networks, to own fixed network, to other fixed networks and to international networks) |
| SMS traffic on net postpaid | Brief messaging traffic (SMS) exchanged between subscriptions to the same mobile network, under the post-paid modality. |

| Indicator | Definition |
|---|---|
| SMS traffic on net prepaid | Brief messaging traffic (SMS) exchanged between subscriptions to the same mobile network, under the pre-paid modality. |
| Postpaid SMS traffic off net | Brief messaging traffic (SMS) sent and received by subscriptions to the mobile telephony service under the post-paid modality. |
| Prepaid SMS traffic off net | Brief messaging traffic (SMS) sent and received by subscriptions to the mobile telephony service under the pre-paid modality. |
| Prepaid or postpaid national SMS traffic | Brief messaging traffic (SMS) sent to national destinations from mobile telephones under the post-paid or pre-paid modality. |
| Postpaid or prepaid international SMS traffic | Brief messaging traffic (SMS) sent to international destinations from mobile telephones under the post-paid or pre-paid modality. |
| Postpaid MMS traffic on net | Traffic of Multimedia (MMS) messages exchanged between subscriptions of the same mobile network under the post-paid modality. |
| Prepaid MMS traffic on net | Traffic of Multimedia (MMS) messages exchanged between subscriptions of the same mobile network under the pre-paid modality. |
| Post-paid MMS traffic off net | Traffic of Multimedia messages (SMS) sent and received by subscriptions to the mobile telephony service under the post-paid modality. |
| Prepaid MMS off net traffic | Traffic of Multimedia (MMS) messages sent and received by subscriptions to the mobile telephony service under the pre-paid modality. Excludes: MMS on net traffic. |
| Post-paid or pre-paid national MMS | Traffic of Multimedia (MMS) messages sent to national destinations from mobile telephones under the post-paid or the pre-paid modality. |
| Postpaid or prepaid international MMS | Traffic of Multimedia (MMS) messages sent to international destinations from mobile telephones under the post-paid or the pre-paid modality. |
| Outbound roaming telephone Traffic | Total number of minutes of communication traffic made by own customers through local networks in roaming with foreign networks, when they are out of the zone of services of the local network (outbound roaming) |
| Inbound roaming telephone Traffic | Total number of minutes of communication traffic received by own customers through local networks in roaming with foreign networks, when they are out of the zone of services of the local network (outbound roaming) |
| SMS and MMS traffic in international outbound roaming | Traffic generated by resident mobile subscribers when sending SMS and MMS when they are out of the zone of service of the local network. |
| SMS and MMS traffic in international inbound roaming | Traffic generated by resident mobile subscribers when receiving SMS and MMS when they are out of the zone of service of the local network (inbound roaming). |
| Data traffic in inbound roaming (TB) | Traffic transmitted (in TB) by resident subscribers in accessing Internet services when they are located out of the zone of services of the local network (inbound roaming). |
| Data traffic in outbound roaming (TB) | Traffic received (in TB) by resident subscribers in accessing Internet services when they are located out of the zone of services of the local network (outbound roaming). |
| Average prices | Average prices of a call from a mobile telephone (prepaid or postpaid). |

| Indicator | Definition |
|--|---|
| Average price of a local one minute call (peak hours, on net) for mobile cellular telephony | Price of a local call for one minute, made during peak hours from a mobile telephone line. The calculation of this indicator can be made based on the distribution of the income generated from mobile calls (pre-paid or post-paid) on net, made during the time window considered as “peak” or high consumption hours, divided by the number of minutes consumed (traffic) in these calls. It includes taxes. |
| Average price of a local call per minute (out of peak hours, on net) for mobile telephones | Price of a local call per minute carried out during peak hours from a mobile cellular phone (Prepaid or postpaid) to another cell phone from the same network. Calculation for this indicator may start with the distribution of the income generated by prepaid on net mobile calls done during “non-peak” hours or low consumption, by the number of minutes consumed (traffic) in these calls. Includes taxes. |
| Average price for a local call per minute (out of peak hours, on net) for mobile cellular telephony | Price of a local call for one minute, made out during peak hours from a mobile cellular telephone (pre-paid or post-paid) to another mobile cellular telephone of the same network. The calculation of this indicator can be done based on the distribution of the income generated under the concept of pre-paid mobile calls on net made during the “non-peak” hours or low consumption hours, divided by the number of minutes consumed (traffic) in these calls. It includes taxes. |
| Average price of a local call per minute (out of peak hours, off net) for mobile cellular telephony | Price of a local call per minute made out during peak hours from a mobile cellular telephone (pre-paid or post-paid) to the mobile cellular telephony of another network. The calculation of this indicator can be made based on the distribution of the income generated under the concept of pre-paid or post-paid mobile calls off net made during “non-peak” or low consumption hours, divided by the number of minutes consumed (traffic) in these calls. It includes taxes. |
| Average price of a local call per minute (peak hours to a fixed network) for mobile cellular telephony | Price of a local call per minute made out during peak hours from a mobile cellular telephone (prepaid or postpaid) to the fixed telephone network. Calculation may start with the distribution of the income generated by prepaid mobile called done to a fixed network during “non-peak” or low consumption hours by the number of minutes consumed (traffic) during these calls. It includes taxes. |
| Average price of a local call per minute (peak hours, off net) for mobile cellular telephony | Price of a local call per minute made in peak hours from a mobile cellular telephone (pre-paid or post-paid) to the fixed telephone network. The calculation of this indicator can be made based on the distribution of income generated for pre-paid or port-paid mobile calls made to a fixed network during the peak hours or high consumption hours, divided by the number of minutes consumed (traffic) in these calls. It includes taxes. |

| Indicator | Definition |
|--|--|
| Average Price of a local call per minute (weekend/at night, on net) for mobile telephony | Price of a local call per minute made during the weekend, at night from a (pre-paid or post-paid) mobile cellular phone to a mobile telephone from the same network. Must include taxes; otherwise, include a note with the taxable rate. Calculation of this indicator may be done based on the distribution of income generated by pre-paid on net mobile calls during the weekend, at night, divided by the number of minutes (traffic) including taxes. |
| Average Price of a local call per minute (weekend, at night, off net) for mobile cellular telephony. | Price of a local call per minute made during the weekend, at night, from a mobile cellular telephone (pre-paid or post-paid) to a mobile telephone service from another network... The calculation of this indicator can be made based on the distribution of the income generated by pre-paid off net mobile calls made during the weekend, at night, divided by the number of minutes (traffic). It includes taxes. |
| Average price of a local call per minute (weekend, night, to a fixed network) for mobile Cellular telephony. | Price of a local call per minute made during the weekend, at night, from a mobile cellular telephone (pre-paid or post-paid) to the fixed telephone network. The calculation of this indicator can be made based on the distribution of the income generated by pre-paid or post-paid mobile calls to a fixed network made during the weekend, at night, divided by the number of minutes (traffic). It includes taxes. |
| Average SMS (on net) price for pre-paid and post-paid mobile cellular telephony | Average price of sending a brief message (SMS) from a mobile cellular telephone (pre-paid or post-paid) to the mobile cellular telephony of the same network. The calculation of this indicator can be made based on the distribution of the income generated divided by the number of SMS on net. It includes taxes. |
| Average SMS (off net) price for pre-paid and post-paid mobile cellular telephony | Average price of sending a brief message (SMS) from a mobile cellular telephone (pre-paid or post-paid) to the mobile cellular telephony of another network. The calculation of this indicator can be made based on the distribution of the income generated divided by the number of SMS off net. It includes taxes. |
| Income for pre-paid or postpaid mobile telephone service | Income associated to the pre-paid or post-paid mobile telephony service. This is constructed from the aggregation of the income for the monthly rate, the income for excess minutes and the income that corresponds to other charges generated as part of the provision of the mobile telephony service; they are not part of the monthly rate or of the inherent rate for excess minutes, as the fines for suspension or reconnection. |
| Income for mobile voice traffic on net pre-paid or post-paid | Income associated to the mobile voice traffic originated in own mobile network (on net mobile) with destination to the same mobile network (on net mobile). |
| Income for outbound mobile voice traffic pre-paid or post-paid | Income associated to the mobile voice traffic originated in own mobile network (on net mobile) with off net destination (own fixed network, other fixed networks, other mobile networks, international networks). |
| Income for monthly subscription or minimal rate pre-paid or post-paid | Income obtained from the collection of recurrent taxable rates in the subscription of the pre-paid or post-paid mobile telephony service. |

| Indicator | Definition |
|--|--|
| Income for excess in fixed mobile telephone service prepaid or post-paid | Income associated to the excess minutes or minutes not contemplated in the minimal rate of the pre-paid or post-paid service. This includes excess minutes for local and international calls. |
| Income for inbound mobile voice traffic pre-paid or post-paid | Income associated to the traffic with off net origin (own mobile network, other fixed networks, other mobile networks, international networks) and on net destination (own fixed network). |
| Inbound mobile voice traffic pre-paid or post-paid | Income associated to the mobile voice traffic originated in own mobile network (on net mobile) with international off net destination. |
| Income for number of on net SMS post-paid or pre-paid | Income associated to the traffic of brief messages (SMS) exchanged between users of the same mobile network under the post-paid or pre-paid modality, |
| Income for number of off net SMS post-paid or pre-paid | Income associated to the traffic of brief messages (SMS sent to national and international destinations from mobile telephones, under the post-paid or pre-paid modality. |
| Income for the number of on net MMS post-paid or pre-paid | Income associated to the traffic of multimedia messaging service (MMS) exchanged between users of the same mobile network, under the post-paid or pre-paid modality. |
| Income for the number of on net MMS post-paid or pre-paid | Income associated to the traffic of multimedia messaging service (MMS) sent to national and international destinations from mobile telephones, under the post-paid or pre-paid modality. |
| Income for MMS sent to national destinations post-paid or pre-paid | Income associated to the total traffic of multimedia messages (MMS) sent to national destinations. It does not include messages sent from a computer to other computers or to mobile telephones. |
| Income for MMS sent to international destinations postpaid or pre-paid | Income associated to the total traffic of multimedia messages (MMS) sent to international destinations. It does not include messages sent from a computer to other computers or to mobile telephones. |
| Income for SMS sent to national destinations post-paid or pre-paid | Income associated to the traffic of brief messages (SMS) sent to national destinations from mobile telephones. |
| Income for the number of SMS sent to international destinations post | Income associated to the traffic of brief messages (SMS) sent to international destinations from mobile telephones. |
| Income for the total number of MMS | Income associated to the total traffic of multimedia messages (MMS) sent to national and international destinations. It does not include messages sent from a computer to other computers or to mobile telephones. |
| Income for outbound roaming telephone traffic (minutes) | Income generated by the subscribers to mobile telephony in making and receiving calls when they are out of the zone of service of the network from their country; for example, when they travel overseas. |
| Income for inbound roaming telephone traffic (minutes) | Income generated by the visiting subscribers (foreigners) in making or receiving calls in a country. This income is obtained by the operators of the network in the country of the visiting subscribers. |

| Indicator | Definition |
|--|---|
| Income for outbound roaming in SMS and MMS | Income generated by the subscribers to mobile telephony in sending SMS and MMS when they are out of the zone of service of the network from their country. |
| Income for inbound roaming in SMS and MMS | Income for the traffic generated by the visiting subscribers (foreigners) in receiving SMS and MMS. This income is obtained by the o |
| Inbound roaming in data traffic (TB)) | Income for the traffic generated by the visiting subscribers (foreigners) in accessing the Internet. This income is obtained by the operators of the network in the country of the visiting subscribers. |
| Outbound roaming in data traffic (TB) | Income generated by the subscribers to mobile telephony in accessing the Internet when they are out of the zone of service of the network from their country. |
| Wholesale income for the mobile telephony service | Wholesale income associated to the provision of the mobile telephone service. This refers specifically to the income from the charges of termination of calls in own network. This indicator is estimated based on the sum of the income received from the incoming traffic in own mobile networks. |
| Ingreso mayorista por concepto del servicio de telefonía móvil | Ingreso mayorista asociado a la prestación del servicio telefónico móvil. Específicamente, se refiere a los ingresos obtenidos a partir de los cargos de terminación de las llamadas en la red móvil propia. Este Indicador se estima a partir de la suma de los ingresos percibidos por el tráfico entrante a la red móvil propia. |

Source: SUTEL, General Directorate for Markets.

Table N° 6
Costa Rica. Indicators of paid television service, 2017

| Indicator | Definition |
|--|---|
| Total number of subscriptions to multi-channel television via Cable TV services. | Number of subscriptions to multi-channel television, transmitted via ground means through hybrid fiber optic and coaxial wire (HFC) networks. These networks allow for the provision of other telecommunications services. |
| Total number of subscriptions to multi-channel television via direct household antennas (DTH). | Number of subscriptions to multi-channel television that correspond to television signals received from a communications satellite and that are transmitted from the operator to the receiving device of the final user. |
| Total number of subscriptions to multi-channel television via IPTV. | Number of subscriptions to multi-channel television through broadband connections over the IP protocol. |
| Total number of subscriptions to multi-channel television through Microwave Multipoint Distribution Service (MMDS) | Number of subscriptions to multi-channel television using the Microwave Multipoint Distribution Service which transmits wireless signals to the final user. This service allows for the provision of other telecommunications services. |
| Income for paid television service (income for subscriptions, connection, basic plan and value added) | Total income invoiced for paid television service, without deductions (taxes, returns, discounts, bonuses, offers, cancelled sales, and other), obtained in the country by the paid TV service providers. |

Source: SUTEL, General Directorate for Markets.

Methodology applied to the system of monitoring and evaluation of FONATEL's programs and projects (Chapter FONATEL page 159)

Articles 32, 33 and 34 of the TGL authorize the SUTEL to develop projects that guarantee the access and use of telecommunications services to populations under economic, social and cultural risks. This is carried out with funds coming from the National Fund of Telecommunications (FONATEL) according to the objectives set in such law, and the goals and priorities defined in the current National Plan of Development of Telecommunications (NPDT).

Based on the above, we will explain the methodology used to measure the programs and projects currently managed by this Superintendence thru FONATEL.

To determine the reach of the programs managed by FONATEL, SUTEL Works with an Annual Plan of Project and Programs, from here on known as PAP&P, a tool that

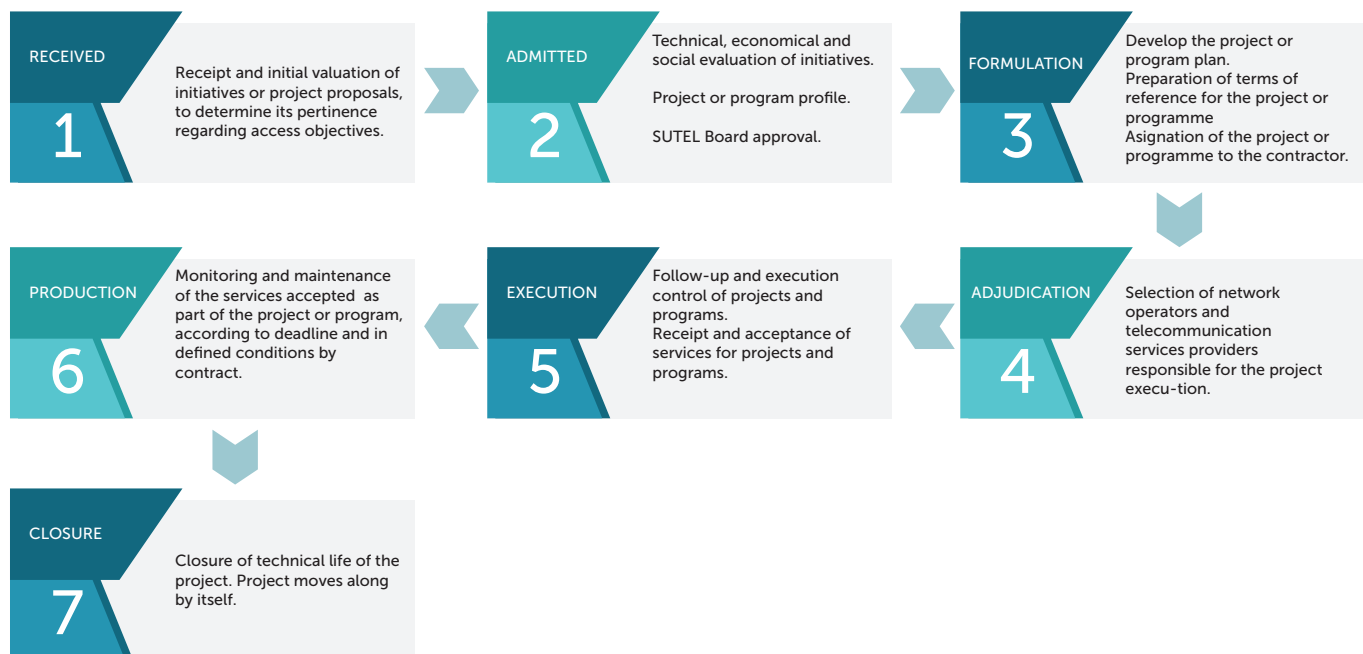
communicates, organizes and allows the monitoring and evaluation of the projects and programs of Access, universal service and solidarity during the current period.

Nowadays, SUTEL/FONATEL has a portfolio that includes 6 programs, namely:

- Connected Communities Program
- Connected Households Program
- Connected Public Centers Program
- Connected Public Spaces Program
- Solidarity Red Broadband Program
- Connected Citizen Program

Throughout the project's management (creation, execution and conclusion) these follow a seven step procedure (see figure N° 6):

Figure N° 6
Costa Rica. Lifecycle of the portfolio of projects financed thru FONATEL



Source: SUTEL, General Directorate for FONATEL.

As part of the controlling, monitoring and evaluation functions of the projects developed and approved by SUTEL to FONATEL, results are collected, analyzed and generated considering two types of indicators: Operating and of perception.

Operating Indicators

Operating indicators measure the progress in the compliance of product goals contemplated in each program and project. That is, they provide information about the performance of the actions relative to the provision of services, infrastructure and devices, starting with each intervention. The collection and analysis of these indicators is performed on a monthly basis via the monthly execution reports prepared by the Fiduciary of the Trust (Banco Nacional de Costa Rica) jointly with the units of administracion¹ of the respective programs and projects.

The methodology based on the “Method of Logic Framework”² and the “Chain of Results”³ is used for the collection of operating indicators to guarantee that the programs, Projects and actions associated to these are aligned to the objectives and goals of Access and universal services and solidarity included in Law 8642 and regulations, the Rules of Access and Universal Service and Solidarity (RAUSUS) and the National Plan of Development (PND) and the National Plan of Development of Telecommunications (PNDT) currently active. This methodology includes templates for the registration of the information and a catalog of indicators developed jointly with the corresponding offices of administration. The Fiduciary of the Trust completes and submits the templates of indicators to the DGS according to the calendar previously defined.

To facilitate presentation and understanding, operating indicators are sub divided into two groups, namely:

- **Cross-check Indicators:** it groups the indicators that measure results in a general way thru the development of FONATEL's programs and projects.
- **Indicators per program:** it measures the indicators that measure results in a specific form thru the development of FONATEL's programs and projects.

Indicators of Perception

Indicators of perception measure the short and midterm results achieved by the products of an intervention (impact indicators), as well as the way in which the target population receives, uses and takes advantage of the goods and services available to them (success indicators). The compilation and analysis of these indicators is performed annually using perception surveys, ethnographic tests, interviews and other statistical instruments focused on the demand or beneficiaries of the programs and projects managed by FONATEL.

In the case of the indicators of perception, the SUTEL applies a process of exploration based on the opinion of the populations that benefit from FONATEL. A sample, representing the populations served by each program is selected and used as the basis to develop the statistical instruments that best fit each program. In the case of specific populations such as people with disabilities, indigenous populations and senior citizens, the institutions leading each population provides technical support and helps validate the instruments that will be applied.

The evolution corresponding to 2017 was made in first quarter 2018 through the following statistical instruments:

¹ Unit administracion: auxiliary body of the Trust, formed by a team of professionals or specialists hired by the Trustee to support it in the required technical areas, related to the projects and programs to be carried out under the resources of the Trust.

² The logical framework matrix is a four-row by four-column instrument that summarizes the most important aspects of the project. Columns: narrative summary of objectives and activities, indicators (specific results to be achieved, means of verification and assumptions (external factors that imply risks) Rows: components of the EAP: purpose, purpose, components / results and activities required to produce the Components / Results For more information, refer to the Theory of the Impact Monitoring and Evaluation System of FONATEL.

³ The results chain provides a clear and logical definition of how the sequence of inputs, activities and products, directly related to the intervention, interact and allow the achievement of the effects and impacts. For more information, refer to the Theory of the Monitoring and Impact Evaluation System of FONATEL.

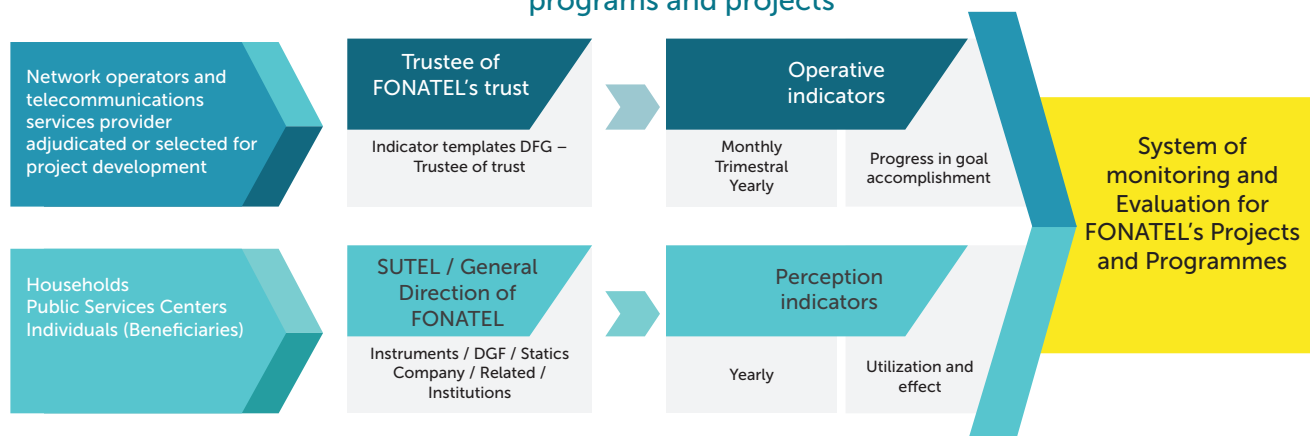
Table N° 7
Costa Rica. Description of the statistical instruments used for the
statistic assessment of FONATEL's programs and projects.

| Program | Tool | Sample | Application Mechanism | Reach Scope |
|-----------------------|-------------------|-----------------------------|--|--|
| Communities connected | Survey | 2,000 homes | 1,760 face to face 440 over the phone | Regional: regions covered through the Program (Atlantic Huetar, North Huetar and Brunca) |
| | | 200 Public Services Centers | 150 over the telephone 50 face to face | |
| Homes connected | Survey | 2,000 homes | 1,600 over the telephone 400 face to face | National coverage: homes from income quintiles 1, 2 and 3, selected by the IMAS |
| | Ethnographic Test | 45 homes | 4 visits to each home, 1 per week (Observation and conversation) | |

Source: SUTEL, General Directorate for FONATEL.

Once the indicators are collected (both operating and of perception) these are reviewed, analyzed, systematized and presented by representatives of the DGF into the System of Monitoring and Impact Evaluation (SME), a system that registers and facilitates the analysis of information relative to the progress in the development of the projects in the phases of execution and production, as well as their effect and impact they have over target populations.

Figure N° 7
Costa Rica. Summary of the system of monitoring and assessment of FONATEL's
programs and projects



Source: SUTEL, General Directorate for FONATEL.

Table N° 8 shows a sample of the catalog of cross-check indicators and by program.

Table N° 8
Costa Rica. FONATEL: Catalog for monitoring and assessment of FONATEL's programs and projects

| Indicator | Definition |
|---|---|
| Indicadores Transversales | |
| Income from FONATEL's trust according to expense item | Amount of income of FONATEL's Trust added and broken down by account (interests over securities, CEPF, expiration of securities, effective date on previous periods, etc.) The figures must be indicated in Colones. |
| Percentage breakdown of the Total Income accounts of FONATEL's Trust. | Percentage of participation of the accounts in the total income of FONATEL's trust. |
| Expense of FONATEL's trust based on Concept. | Amount of the expense of FONATEL's Trust added and broken down by account (supervisory committee, administration units, Budget of the General Directorate of FONATEL, financial administration, administration, plan of projects and programs, etc.) |
| Percentage breakdown of the accounts of Total Expense of FONATEL's trust. | Percentage of participation of the accounts in the total expense of FONATEL's Trust. |
| Total number of FONATEL's projects in progress. | Total number of projects developed with FONATEL's resources. It includes all the projects in the phase of design, formulation, execution, production or closing. |
| Total number of FONATEL's projects in the phase of execution. | Total number of projects developed by FONATEL that are in the phase of execution or that have the letter of acceptance of the services provided by the program or Project. |
| Total number of FONATEL's projects in the phase of production. | Total number of FONATEL's projects in the phase of production or that are providing services to the target population. |
| Geographic coverage of FONATEL's programs and projects | Graphic representation of the districts and territories intervened with resources of FONATEL thru at least one program or Project. The representation uses color spots over a map of Costa Rica. |
| Number of districts covered thru FONATEL | Number of districts intervened with resources of FONATEL thru at least one program or project. |
| Number of households with Access to telecommunications services provided by FONATEL | Number of households that have Access to at least one of the services of telecommunications provided by some of the programs or projects financed by FONATEL. In the case of the Households Connected Program, it considers the total number of households intervened according to the administrative records of the implementation office. In the case of the Communities Connected Program, it considers the total number of households in the districts intervened by Project, using the figures of homes published by the INEC. |

| Indicator | Definition |
|--|---|
| Number of people with Access to telecommunications services provided thru FONATEL | <p>Number of inhabitants that have Access to at least of one the services of telecommunications provided by some of the programs or projects financed by FONATEL.</p> <p>In the case of the Households Connected Program, it is calculated multiplying the total number of households intervened according to the administrative records of the implementation office by the average number of persons per home estimated by the INEC.</p> <p>In the case of the Communities Connected Program, it considers the total number of households in the districts intervened by Project, using the number of homes published by the INEC and multiplied by the average number of people per home provided by this institute.</p> |
| Total number of devices provided thru FONATEL | Number of devices of telecommunications for the Access and use of the telecommunications provided via the programs and projects of FONATEL. |
| Investment in the annual plan of projects and programs (PAPyP) of FONATEL | <p>Sum of the amounts of FONATEL that have been executed for the development of programs and projects included in the Annual Plan of Projects and Programs (PAP&P).</p> <p>The figures must be indicated in Colones.</p> |
| FONATEL investment according to program | <p>Sum of the amounts of FONATEL that have been executed for the development of each one of the programs within the Annual Plan of Projects and Programs. (PAP&P).</p> <p>The figures must be indicated in colones.</p> |
| Percentage of FONATEL's investment by network operator and telecommunications service provider. | <p>Percentage of the amount of FONATEL that has been executed for the development of the programs and projects included in the Annual Plan of Projects and Programs (PAPyP) by network operator and telecommunications service provider.</p> <p>The calculation is done dividing the amount executed by network operator by the total amount of FONATEL's investment.</p> <p>The figures must be indicated in colones.</p> |
| Indicators by Program | |
| Program 1: Communities Connected | |
| Number of Projects of the Communities Connected Program in the phase of development | Total number of projects of the Communities Connected Program that are in the phase of design, formulation, execution, production or closing. |
| Number of Projects of the Communities Connected Program in the phase of execution | Total number of projects in the Communities Connected Program that are in the phase of execution or that have a letter of acceptance for the services of the program or Project. |
| Geographic coverage of the Communities Connected Program | <p>Graphic representation of the districts and territories intervened thru the Communities Connected Program.</p> <p>Represented with color spots over a map of Costa Rica.</p> |
| Number of households with access to telecommunications services provided by the program of Communities Connected | <p>Number of households with Access to at least one telecommunications service provided by some of the programs or projects financed by Sutel.</p> <p>Calculated based on the total number of households from the districts intervened by Project, according to the number of homes published by INEC.</p> |

| Indicator | Definition |
|---|--|
| Number of people with Access to the telecommunications service provided by the Program of Communities Connected | Number of households with access to at least one telecommunications service provided by some of the programs or projects financed by Sutel. The calculation takes the number of households in the districts intervened by Project, according to the number of homes published by the INEC and multiplies them by the average number of people estimated by this institute per home. |
| Total number of CPSP connected | Number of Public Services Centers (CPSP) with telecommunications services provided by the Communities Connected Program. |
| Percentage of progress in the connection of the CPSP | Proportion of Public Services Centers (CPSP) interconnected thru the Communities Connected program in regard to the total number of CPSP forecasted. |
| Number of public services centers connected by the Communities Connected Program | Number of Public Services Centers or State institutions that provide public services and have telecommunications services provided by the Communities Connected Program. |
| Percentage of public centers connected by the Communities Connected Program | Number of Public Services Centers or State institutions that provide public services and have telecommunications services provided by the Communities Connected Program. To calculate, divide the total number of CPSP covered per project by the total CPSP intervened thru the Communities Connected Program. |
| Number of Public Centers pending coverage by the Communities Connected Program | Number of Public Services Centers (CPSP) or State institutions that provide services to the public, pending of coverage thru the Communities Connected Program, as per the goals set in the formulation of each Project. |
| Number of Public Centers included in the Communities Connected Program that were received and are operating | Number of Public Services Centers (CPSP) or State Institutions that have telecommunications services provided by the Communities Connected Program and that are making use of them. |
| Total number of subscriptions of the Communities Connected Program by telecommunications service | Número total de personas que han suscrito un contrato para el suministro de, al menos, un servicio de telecomunicaciones provisto por el Programa Comunidades Conectadas. |
| Percentage of subscriptions to the mobile telephony service provided by the Communities Connected program, by project | Percentage of subscriptions to the mobile telephone service offered thru the Communities Connected Program, by Project. To calculate, divide the total number of subscriptions to mobile telephony per Project by the total number of subscriptions to this service in the Community Connected Program. |

| Indicator | Definition |
|--|---|
| Percentage of subscriptions to the fixed telephony service provided by the Communities Connected Program, by Project | Percentage of subscriptions to the fixed telephony service offered thru the Communities Connected Program To calculate, divide the total number of subscriptions to the fixed telephony service per Project by the total number of subscriptions to this service of the Communities Connected Program. |
| Percentage of subscriptions to the service of Access to fixed Internet provided by the Communities Connected Program, by project | Percentage of subscriptions to the service of fixed Internet Access offered thru the Communities Connected Program, by Project. |
| FONATEL investment executed by the Communities Connected Program | Sum of all the amounts executed by FONATEL for the development of the Communities Connected Program. The figures must be indicated in Colones. |
| Percentage of FONATEL's investment that has been executed by the Communities Connected Program, by operator | Percentage of the amount of FONATEL used for the development of the Communities Connected Program, by operator of telecommunications network. To calculate divide the amount executed by network operators by the total amount of investment of the Program. |
| Program 2: Households connected | |
| Number of households benefitting by the Households Connected program | Number of households with, at least one portable computer provided by the Household Connected Program. It includes: Households who signed a contract with some telecommunications service provided of the Program and who received the services offered therein (computer and Internet), including those that cancelled or left due to a specific situation (computer stolen, death of the holder, move to an area without coverage, etc.). This data is catalogued as the real record of monthly beneficiaries, since they received the services at some point in time but no longer receive the services (partially or fully) due to an external cause or associated risk. It excludes "assigned" households or those contacted by some telecommunications service provider of the Program but that, up to the cut-off date had not subscribed a contract with any. The data comes from the administrative records of the implementation office. |
| Number of active subscriptions to the Households Connected Program | Total number of households who have Internet Access and a portable computer provided by the Connected Households Program. Excludes: <ul style="list-style-type: none"> Households that had internet connection but were disconnected when they moved to a zone with no coverage, the computer was stolen, payment was late, among others. "Assigned" home or those that had expressed their desire to join the Program but that to the cut-off date had not signed a contract with any telecommunications service provider. |

| Indicator | Definition |
|--|--|
| Number of households contacted by the Connected Households Program | Number of households that were contacted by some telecommunications service provided but that up to the cut-off date had not subscribed a contract with any and, therefore, had not received any of the services offered by the Program. It is calculating adding the total number of assigns to the total number of households that have benefitted from the program (Active subscriptions plus canceled). |
| Number of people who have received benefits from the Households Connected Program | Number of inhabitants who have computer access thanks to the Connected Households Program. To calculate, multiply the total number of households intervened with portable computer according to administrative records of the implementation office by the average number of people per home estimated by INEC. |
| Number of beneficiaries of the Connected Households Program by province | Number of homes with at least a portable computer provided by the Connected Households Program, by province. The data comes from the administrative records of the implementation office. |
| Percentage of beneficiaries of the Connected Households Program by Province | Number of homes with at least a portable computer provided by the Connected Households Program, by province. To calculate, divide the total number of homes that benefit from the Program by province by the total number of beneficiaries. The data comes from the administrative records of the implementation office |
| Concentration by district of households covered by the Households Connected Program | Graphic representation of the districts intervened by the Households Connected Program according to the concentration of homes benefitted by district. Represented using color spots over a map of Costa Rica. |
| Percentage of beneficiaries of the Households Connected Program by quintile of income | Percentage of households with at least a portable computer provided by the Households Connected Program according to the quintile of income, according to the parameters set by INEC. Calculated dividing the total number of household benefitted by the Program by supplier of telecommunications service by the total number of beneficiaries. The data comes from the administrative records of the implementation office. |
| Percentage of beneficiaries of the Households Connected Program by telecommunications service provider | Percentage of homes with at least a portable computer provided by the Households Connected Programs by telecommunications service provider. Calculated dividing the total number of households benefitted by the Program by telecommunications service provider by the total number of beneficiaries. The data comes from the administrative records of the implementation office. |
| Investment of FONATEL Executed by the Households Connected Program | Sum of the amounts of FONATEL executed by the development of the Households Connected Program. The figures must be indicated in colones. |
| Investment of FONATEL Executed by the Households Connected Operator | Percentage of the amounts of FONATEL executed by the development of the Households Connected Program, by telecommunications service provider. Calculated dividing the amount executed by telecommunications service provider by the total amount of investment of the Program. |

| Indicator | Definition |
|--|--|
| Program 3: Public Centers Equipped | |
| Amount of equipment required by the Public Centers Equipped Program | Number of devices required by the Centros de Prestación de Servicios Públicos (CPSP) or State Institutions that provide services to the public available by the Public Centers Equipped Program. |
| Percentage of equipment required by the Public Centers Equipped Program | Percentage of devices required by the Centros de Prestación de Servicios Públicos (CPSP) or institutions that provide the public with services available by the Public Centers Equipped Program. It is calculated dividing the total number of devices required by the CPSP by the total number of devices required by the Program. |
| Amount of equipment delivered and installed by the Public Centers Equipped Program | Number of devices delivered and installed in the Centros de Prestación de Servicios Públicos (CPSP) or institutions that provide the public with services available by the Public Centers Equipped Program |
| Percentage of equipment delivered and installed by the Public Centers Equipped Program | Percentage of devices delivered and installed at the Centros de Prestación de Servicios Públicos (CPSP) or institutions that provide the public with the services available by the Public Centers Equipped Program It is calculated dividing the total number of devices delivered and installed by the CPSP by the total number of devices provided thru the Program. |
| Number of devices pending for delivery according to the goals set by the Public Centers Equipped Program | Number of devices pending for delivery to the Centros de Prestación de Servicios Públicos (CPSP) or institutions that provide the public with the services available, as per the goals set in the formulation of the Public Centers Equipped Program. |
| Percentage of Public Services Centers covered by the Equipped Public Centers Program | Percentage of Public Services Centers or institutions that provide the public with the services available, and that have been intervened by the Equipped Public Centers Program. It is calculated dividing the total number of CPSP intervened by the Equipped Public Centers Program by the total number of set as goal in the formulation of this Program. |
| Number of Public Services Centers covered and pending as per the goal of the Project Equipped Public Centers Program | Amount of Public Services Centers or institutions that provide the public with services available, and that have been intervened by the Equipped Public Centers Program. |
| Percentage of Public Services Centers pending to cover by the Equipped Public Centers Program. | Percentage of Public Services Centers or institutions that provide the public with services available pending of intervention by the Equipped Public Centers Program, as per the goals set in this Program. It is calculated dividing the total number of CPSP intervened by the Equipped Public Center Program by the total number of CPSP set as goal during the formulation of this Program. |

Source: SUTEL, General Directorate for FONATEL.

Methodology applied to Quality Indicators (Chapter Network quality, page 141)

There are two types of quality indicators associated to this publication: 1) perception and level of user satisfaction and 2) associated to the specific measurements of the provision of mobile services (quality measures of the drive test type for mobile networks)

Next, a detail of the methodological aspects applied in both cases.

Methodology applied in the studies of perception and level of satisfaction of the quality of services

The study of perception and level of satisfaction of quality of the services included the application of surveys to final users that were contracted by SUTEL on a multiannual basis. The company Excelencia Técnica en Informática S.A. won public bid 2016LN-000001-SUTEL of 2016. This contract is renewable for up to 4 years after the first year of execution.

Operators evaluated by the study of perception are defined in the solicitation and correspond to:

1. Service of fixed telephony:
 - a. Cabletica
 - b. CallMyWay
 - c. ICE
 - d. Telecable
 - e. Tigo
2. Services of mobile telephony and mobile internet:
 - a. Claro
 - b. Fullmobile
 - c. ICE
 - d. Telefónica
 - e. Tuyo Mobile
3. Service of fixed internet:
 - a. Cabletica
 - b. ICE
 - c. Telecable
 - d. Tigo
4. Service of paid television
 - a. Cabletica
 - b. Claro

- c. Telecable
- d. Tigo
- e. Sky

The sample included 600 users per operator that are taken from a numerical database supplied by the operators or service providers, with a margin of error of 4 % and a level of confidence of 95 %.

It is important to note that the samples maintain the same level of confidence and margin of error, and the instrument is the same so when samples vary these are compensated by the element of randomness of the response of users, making the data comparable with previous years.

The initial stage of the study including an update of the tools to apply (surveys), a process that was done by the teams of the polling firm and SUTEL. The elements considered in these surveys are explained in table N° 9 and are defined in the Rules for the Provision and Quality of Service that were valid up until February 16, 2018.

The execution state included the application to final users (male and female over 18 years old) of the services provided by the operators/suppliers with a significant quota in the market. Likewise, the study was applied to active users of the difference services, including the different modalities of post-paid and pre-paid according to the service acquired.

This stage included a total of 5 months. One full month (between April 18 and September 8, 2017) was dedicated to the evaluation of each service.

At the end of each one of the cycles of the surveys by service, the company Excelencia Técnica en Informática S.A., put together a report with the results obtained per item. This report was endorsed by the technical team of SUTEL. After the approval of SUTEL's technical team, the company submitted the data that helped generate the annual report of perception and level of satisfaction of the quality of services.

Summary of the indicators of perception and level of satisfaction of quality

The following table shows the definitions of the indicators compiled in this subject.

Table N° 9
Costa Rica. Breakdown of the indicators and aspects included in the tools (survey)

| Factors | Service of Fixed Telephony (traditional basic and VoIP) | Service of mobile telephony and mobile internet | Service of Fixed Internet | Service of paid television |
|-----------------------------|--|---|---|-------------------------------|
| Personalized attention | -Time person waited on hold until served -The attention received by the person who responded -The solution to the problem or question asked | | | |
| Telephone attention | -Time person waited on hold until served -The attention received by the person who responded -The solution to the problem or question asked | | | |
| Delivery of the Service | -Wait time between the moment the service was contracted until it was installed. -Attention of the people who installed the service -Correct and functional installation of the service. | -Wait time until the service was activated. -Correct and functional activation of the Service. | -Wait time between contracting of the service and installation. -Attention of the personnel who arrived to installed the service. - Correct and functional activation of the Service. | |
| Repairs | -Attention received at time the issue was reported -Promptness in the solution of the issue reported. -Solution to the issue reported. | | | |
| Invoicing of the service | Only for post-paid clients: -Delivery of the invoice before the due date. -Clarity and detail on the invoice -Accurateness of the amount invoiced. Only for clients of Pre-paid lines: -Easiness to recharge -Number of locations available for recharge -Time elapsed until the recharge is confirmed -Adequate reduction of balances as these are consumed. | Only for post-paid clients: -Delivery of the invoice before the due date Clarity and detail on the invoice -Accurateness of the amount invoiced. Only for clients of Prepaid lines: -Easiness to recharge -Number of locations available for recharge -Time elapsed until the recharge is confirmed -Adequate reduction of balances as these are consumed. | -Delivery of the invoice before the due date Clarity and detail on the invoice -Accurateness of the amount invoiced | |

| Factors | Service of Fixed Telephony (traditional basic and VoIP) | Service of mobile telephony and mobile internet | Service of Fixed Internet | Service of paid television |
|--------------------------|--|--|---|---|
| Operation of the service | <ul style="list-style-type: none"> - Quality of the call -The possibility to use the service all times. -Time elapsed between dialing and hearing the tone -The service regarding calls without interruptions -The quality of the call on international calls. -Calls to telephone numbers that do not belong to the operator providing the service. | <ul style="list-style-type: none"> -Areas of coverage -The possibility to use the service all times, when there is coverage -Quality of the communication once the call starts. - The service regarding calls without interruptions -Duration of delivery of text messages. -Possibility call telephone numbers that do not belong to the operator. -The areas of coverage/maps of speed published by the operator -The quality of the Mobile Data Transfer service once the communication starts. -Mobile Data Transfer service without interruptions once the connection starts. -Speed of the service of Mobile Data Transfer contracted. | <ul style="list-style-type: none"> Possibility to use the Fixed Data Transfer Service all times. -Quality of the data transfer service ones the communication s starts. -Fixed data transfer service without interruptions once the connection starts -Speed of the Fixed Data Transfer service contracted. | <ul style="list-style-type: none"> Clarity of the sound -Clarity of the image -Possibility to use the service at all times -Quality of the signal -Quality of the High Definition (HD) format when applicable. |

Source: SUTEL, General Directorate for Quality.

Methodology applied to “drive test” quality measurements for mobile networks

The quality of mobile networks –for both call service and mobile Internet service-- is assessed nation-wide once a year by the SUTEL, using field tests type drive test that includes several stages, namely:

1. Compilation of inputs and definitions of areas to asses.
2. Delimitation of the annual plan and chronogram of the quality measurements for the mobile service.
3. Execution of field test type “drive test”
4. Processing of compiled data

• Collection of inputs and definition of areas to assess

The main input of national quality measurements for the quality of the mobile service are the layers or coverage

data provided by operators that publish these in their respective Websites.

SUTEL uses these layers or data as the basis to define the areas to evaluate at a national level, and demarcates those towns and roads that have, at least, exterior coverage (yellow coverage⁴).

Within these zones, the following indicators are compiled simultaneously and per operator:

- Coverage (intensity of the signal)
- Status of the call (completed calls, calls blocked, missed calls, calls with no service)
- Time to reestablish a call.
- Quality of voice (quality of calls)
- Performance of the speed measured in regards with the speed contracted (compliance of speed)

⁴ The Rules for the provision and quality of services published in La Gaceta N.º 82 of April 29, 2009 valid until February 16, 2018, defined four types of coverage: coverage inside buildings or coverage in interiors with a level of intensity higher than -75dBm and marked in blue; coverage inside cars or coverage between -75dB y -85dBm and marked in green; coverage only in exteriors or coverage in exteriors with a level of intensity -85dBm and -95dBm y and noted in yellow; and out of coverage with a level of intensity -95dBm and noted in red.

• Definition of the annual plan and chronogram

Once the zones to evaluate are defined, a plan of measurements is implemented. This plan includes the schedule of the evaluations that will be done to collect the samples in the zones already defined, including in a sequential and continuous way the totality of towns and national roads. This measurement plan ends with the formulation of the annual chronogram of measurements that requires, to be very least, 9 months to be completed.

• Execution of field tests of the “drive test” type

Once the plan and the chronogram of measurements are approved, SUTEL's technical team starts the process of compilation of data for 2G, 3G and 4G mobile networks for the operators ICE, Claro and Telefonica (need to note that Fullmovil and Tuyo mobile are virtual mobile operators whose service are provided using ICE networks, and this is why these are not included.)

This process of compilation of data is done with specialized equipment of the “drive test” type located in a vehicle created especially for this purpose, and that runs thru the routes of towns and national roads, compiling jointly and simultaneously the quality conditions offered by the three network operators of mobile telephony and mobile Internet, according to the methodologies stated

In the Procedures for evaluation of the parameters and the quality of the service of mobile telephony in field tests of the drive test type and Procedure for measuring the Performance of the Data Transfer service

in mobile networks commercially known as Mobile Internet, created by this Superintendence, approved and published by the Council via resolutions RCS-260-2012 and RCS-061-2014, accordingly.

Measurements performed in 2017 started on February 6 and ended on November 28, with a schedule of 8:00 a. m. to 7:00 p. m. in towns, and 6:00 a. m. to 10:00 p. m. in roadways.

The trips for measurements conducted in 2017 included a total of 47 195 km of roadways, in 471 districts in the country. These allowed the compilation of an average per operator of 23 million data samples.

• Processing of compiled data

Data processing of the data requires at least 3 months and utilize a tool called Geographic Information System (GIS). This tool makes the filtering of data possible. Filtering consists in keeping only the points of measurements that are found inside each type of coverage layer corresponding to each operator for the indicator included in the study, and according to the classification of the respective technology, excluding all those samples that are out of the reported layers of coverage.

Once valid samples are selected, there is a comparison with the minimum limits of quality defined in the Rules for the provision and quality of services valid at the time of the corresponding evaluation.

The percentage of compliance for each one of the indicators analyses is estimated thanks to this process of comparison.

Summary of quality indicators thru “drive test” for mobile networks

The following table shows the definitions for the indicators of quality of service that compile data using field tests of the “drive test” type annually

Table N° 10
Costa Rica. Definitions of the indicators of quality of the service according to the Rules for the provision and quality of services⁵ valid until February 16, 2018

| Indicator | Definition | | |
|---|--|---|-------------|
| Completion of traffic calls ending at the communications centrals | Corresponds to the perceptual relation between the amount of communication attempts ended at the central that are effectively established, and the total number of communication attempts ended in this communications central. | | |
| Total communication attempts ending at the central effectively established. | Understand as a communication attempt ended at the communications central those that are detected and registered by the respective communications central and whose destination is the own communications central; it includes incoming calls registered by the backbones and internal or local calls. | | |
| Total of communication attempts ending at the central | Effective communication attempt that is terminated; corresponds to every communication attempt that is able to communicate with the destination or corresponding voicemail. | | |
| Delay in the tone of connection of the (DTCLL) | It refers to the time the mobile network takes to respond to a communication request, measured from the moment the client or user sends the information of the request for communication from the terminal to the moment when the mobile network indicates the client or user thru tone or message the status of the communication attempt. | | |
| Areas of coverage or the mobile service. | It refers to the geographic area where the client or user may originate or receive communications with the technical conditions required to establish and continue the communication. | | |
| | The threshold level of signal, measured in exteriors, to consider the different geographical spaces (inside buildings, inside vehicles and in exteriors) is found within the area of coverage of the mobile service of an operator or supplier, and are defined as follows: | | |
| | Type of coverage | Level of Signal (dBm) measured in exteriors | Color Scale |
| | Coverage inside facilities (interiors) | ≥ -75 | Blue |
| | Coverage inside motorized vehicles (vehicles) | $-75 > \text{level of signal} \geq -85$ | Green |
| | Only exteriors (exteriors) | $-85 > \text{level of signal} > -95$ | Yellow |
| | Out of the area of coverage | ≥ -95 | Red |
| Quality of voice in mobile services | It refers to the comparison of the characteristics of the signals (sound and voice) issues in regard to the signals received in the communication between mobile telephony networks, for all technologies of access. Such comparison must be carried out according to the recommendations UIT-T P.800, P.862 and G.107 and the thresholds of compliance will be MOS (Mean Opinion Score) higher or equal to 4, PESQ (Perceptual Evaluation of Speech Quality) higher or equal to 4 accordingly and a value of (R value) above 85 for the E-Model (UIT-T G.107). | | |
| Compliance of the performance of the local and international transfer speed compared to the speed contracted. | It refers to the relation between the speed contracted (line speed) between the client and the operator or supplier and the real transfer speed (throughput) that clients experience for both local and international communications. | | |

Source: SUTEL, General Directorate for Quality.

⁵ Rules for the provision and quality of services published in La Gaceta N.° 82 of April 29, 2009, valid until February 16, 2018.

Methodology for Mobile Telecommunications Price Index

In 2016 and part of 2017, SUTEL designed a price index for the mobile telecommunications market with the collaboration of international institutions such as the National Institute of Statistics and Geography of Mexico; and locally, with the Central Bank of Costa Rica and the National Institute of Statistics and Census.

Such index enables the monitoring of the trends in the prices of the services acquired by mobile telecommunications users whose construction is based on a series of technical criteria, statistical and economic, described below.

The index constructed allow the monitoring of mobile telecommunications services from different angles or perspectives: General index or national, indexes according to modality of pay or indexes by components (voice, data, SMS).

It is important to clarify that, there are no adjustments in the quality of mobile data in the calculation of this index and its different levels and, in the case of the service of voice and SMS, and these consider homogeneous services.

- Mobile Internet services provided via Datacards are not included
- Prepaid promotions targeting specific segments such as, double recharges to numbers ending in 1, are excluded.
- Does not include bundled mobile telecommunications ("packages") with other services.
- Within telecommunications services, mobile is the most dynamic group. This is why this methodology will be updated and enhanced continuously.

Methodological description is as follows:

• Methodology post-paid modality:

The following prices are analyzed monthly for each operator (*i*) as follows:

- $plPT_{i,c,pl,m_1}$ → Unit prices⁶ per component (voice on net, voice off net, SMS on net and SMS off net and mobile data) starting with the selected plan. Each of the plans selected (**(pl),**) that represent at least 80% of the post-paid income per month per operator. Includes plans included in the commercial offer such as those that are not valid to new users, but maintained subscribers affiliated.
- $pePT_{i,c,m_1}$ → Exceeding prices by component.

Operator level (*i*) and during the month of analysis (m_1), there is a unit price for each component for each post-paid plan selected (c) → ($plPT_{i,c,pl,m_1}$). There are mathematically averaged to obtain a middle unit price by component coming from the information of each operator's → ($PMedplPT_{i,c,m_1}$).

Afterwards, to obtain a unique price per component for each operator at m_1 that includes the price for surplus ($pePT$), an average is calculated that includes: (a) the middle unit price of each component ($PMedplPT_{i,c,m_1}$) averaged by the relative weight of the income received from the plans within the total income⁷ of each operator (α_{i,m_1}) and (b) the surplus price of each component ($pePT_{i,c,m_1}$) averaged by the relative weight of the income coming for the surplus within the total post-paid income (β_{i,m_1}). Based on the aforesaid we obtain for each operator at m_1 a unique price per component (PPT_{i,c,m_1}).

Once we figure out the above data at m_1 it is time to calculate the relative change of the unique prices per component at the operator level with regards to July of 2017 ($\Delta PPT_{i,c,m_1}$). These, at the same time, will be weighed based on to the monthly share of each component within the post-paid income of the (uPT_{i,c,m_1}) obtaining a postpaid price index for each offer in the market ($\mu PT_{i,m_1}$).

⁶ Unit prices: to obtain unit prices, distribute the value of each line between voice (on and off net), data and SMS (on y off net), according to the average at the operator level of these components, within the post-paid income of July of 2017 (month of reference); then each one of this amounts id divided by the number of minutes, messages and GB contracted at the maximum speed available for each plan, obtaining a price per unit of measurement.

⁷ Total income post-paid = minimum income (Income from the monthly cost of packages) + income from excess

To conclude, take the index per operator ($\mu PT_{i,m_1}$) and weigh with the monthly share of each operator within the total post-paid income ($\mathfrak{p}PT_{i,m_1}$), with this, obtain the monthly post-paid index at the national level (\tilde{IPT}_{m_1}).

Additionally, to obtain the monthly index per component at the national level (\tilde{IPT}_{c,m_1}) use ($\Delta PPT_{i,c,m_1}$) and weigh by ($\mathfrak{p}PT_{i,m_1}$).

Formulas for the post-paid index:

$$(1) PMedplPT_{i,c,m_1} = \frac{\sum_{npl=1}^{npl} pLPT_{i,c,pl,m_1}}{npl_{i,c,m_1}}$$

$$(2) PPT_{i,c,m_1} = \alpha_{i,m_1} * PMedplPT_{i,c,m_1} + \beta_{i,m_1} * pePT_{i,c,m_1}$$

$$(3) \Delta PPT_{i,c,m_1} = \frac{PPT_{i,c,m_1}}{PPT_{i,c,m_0}}$$

$$(4) \mu PT_{i,m_1} = \sum_{c=1}^5 \Delta PPT_{i,c,m_1} * \mathfrak{O}PT_{i,c,m_1}$$

$$(5) \tilde{IPT}_{m_1} = \sum_{i=1}^3 \mu PT_{i,m_1} * \mathfrak{p}PT_{i,m_1}$$

$$(6) \tilde{IPT}_{c,m_1} = \Delta PPT_{i,c,m_1} * \mathfrak{p}PT_{i,m_1}$$

Nomenclature

i= Market offers where 1= Kolbi, 2= Movistar and 3= Claro

m₀= Base month, July 2017

m₁= Month of analysis

c= Components, 1= voz on net, 2= voz off net, 3= SMS on net, 4= SMS off net and 5 = mobile data.

PT= Post-payment

pl= It is the plan selected by each operator, that goes from 1 thru z.

z= Totality of plans selected by each operator at **m₁**

npl_{i,c,m₁}=Number of operator i plans that were selected and include the component that is being analyzed in **m₁**

• Methodology for pre-paid modality

Pre-paid user faces three types of prices for each component: Prices in Package Price (**paqPR_{i,c,paq,m₁}**), proportioned prices (**prPR_{i,c,pr,m₁}**) and prices of recharge (**recPR_{i,c,m₁}**).

With the objective of consolidating these prices we will explain the approach for each one of them:

1. For monthly middle unit prices, per operator package (**paqPR_{i,c,paq,m₁}**), use the same methodology applies to the unit prices of post-paid plans with the exception that these use the totality of offered pre-paid packages at **m₁**, obtaining (**PMedprPR_{i,c,m₁}**).
2. Market prices for each component per operator at **m₁** (**recPR_{i,c,m₁}**), are set by the operator.
3. In the case of promotions per operator at **m₁** (**prPR_{i,c,pr,m₁}**), analyze the details of the commercial offer to estimate a price per component in each promotion as well as the information coming as international reference such as, for example, the consumption of data for mobile applications⁸ (Facebook, Whatsapp, Waze, Youtube among others), and based on the information requested to operators, such as the average consumption per user of minutes, data, and unlimited messages. Once the prices per component per operator are available, calculate them arithmetically to obtain a unique middle price for promotions per component and operator. (**PMedprPR_{i,c,m₁}**).

Once the above is ready, weight in **m₁** the prices of the three previous sources, based on their share within the pre-paid income of the month of reference⁹ at operator level, **wrec_i** (weigh of income received from operator recharges i), **wpaq_i** (weigh of income from operator packages i) and **wpr_i** (weigh of income from operator's promotions i), thus obtaining a unique price per component for each operator for the month of analysis (**PPR_{i,c,m₁}**).

⁸ Telecommunications Company of Chile, ENTEL. www.entel.cl/calculadora-datos/

⁹ Information for this indicator only available for the base month. (SITEL)

Taking that information, calculate the relative perceptual change of unique prices per component for the month under study with regards to July 2017 ($\Delta PPR_{i,c,m_1}$). These, at the same time, will be weighed by the monthly share of each component within the pre-paid income of the ($\mu PR_{i,c,m_1}$)¹⁰, thus resulting in a pre-paid price index for each offeror of this market in the month ($\mu PR_{i,m_1}$).

To conclude, takes the index by operator ($\mu PR_{i,m_1}$) and weigh it by the monthly share of each operator within the total pre-paid income of the month in study ($\mu PR_{i,m_1}$), and with this we obtain the national monthly pre-paid index (\tilde{IPR}_{m_1}).

Additionally, calculate the monthly index per component at the national level (\tilde{IPR}_{c,m_1}). to calculate, use ($\Delta PPR_{i,c,m_1}$) and weigh by ($\mu PR_{i,m_1}$).

Formulas for the prepaid index:

$$(7) PMedprPR_{i,c,m_1} = \frac{\sum_{npr=1}^{npr} prPR_{i,c,pr,m_1}}{npr_{i,c,m_1}}$$

$$(8) PPR_{i,c,m_1} = wrec_i * recPR_{i,c,m_1} + wpaq_i * PMedpaqPR_{i,c,m_1} + wpr_i * PMedprPR_{i,c,m_1}$$

$$(9) \Delta PPR_{i,c,m_1} = \frac{PPR_{i,c,m_1}}{PPR_{i,c,m_0}}$$

$$(10) \mu PR_{i,m_1} = \sum_{c=1}^5 \Delta PPR_{i,c,m_1} * \mu PR_{i,c,m_1}$$

$$(11) \tilde{IPR}_{m_1} = \sum_{i=1}^5 \mu PR_{i,m_1} * \mu PR_{i,m_1}$$

$$(12) \tilde{IPR}_{c,m_1} = \Delta PPR_{i,c,m_1} * \mu PR_{i,m_1}$$

Nomenclature

i= Market offerors: 1= Kolbi, 2= Movistar, 3= Claro, 4= Automobily 5= Full mobile

m₀= Base month, July 2017

m₁= Month of analysis

c= Components, 1= voz on net, 2= voz off net, 3= SMS on net, 4= SMS off net y 5 = mobile data

PR= Pre-paid

npr_{i,c,m₁}=Number of promotions of operator **i** that include the component analyzed under **m₁**

pr= Each pre-paid promotion for operator **i** for **m₁** starting at 1 until ϵ

ϵ = Totality of promotions from **i** to **m₁**

paq= Each operator's package **i** for **m₁** starts at 1 until **η**

η = Totality of packages for **i** for **m₁**

¹⁰ Where each **i** at **m₁** meets that $\sum_{c=1}^5 \mu PR_c = 1$

rec= Amount of prices of recharge per unit of consumption for each component (one minute for voice, one SMS or one Gb) of operator **i** for **m₁**

• National Index ($\tilde{I}NAL_{m_1}$):

For **m₁** post-paid ($\tilde{I}PT_{m_1}$) and pre-paid indexes ($\tilde{I}PR_{m_1}$) are averaged according to the relative weigh of each modality within the total income of mobile communications¹¹ πPT_{m_1} (weigh of the post-paid modality) and πPR_{m_1} * (weigh pre-paid modality)¹².

Fórmulas Índice nacional:

$$\tilde{I}NAL_{m_1} = \pi PT_{m_1} * \tilde{I}PT_{m_1} + \pi PR_{m_1} * \tilde{I}PR_{m_1}$$

Nomenclature

m₁= Month of Analysis

¹¹ Sum of pre-paid plus post-paid income for the month under study.

¹² Where $\pi PT_{m_1} + \pi PR_{m_1} = 1$



GENERAL EVOLUTION OF THE SECTOR





GENERAL EVOLUTION OF THE SECTOR

The telecommunications market registered incomes of 807,296 millions of colones in 2017, 4 % more than the previous year. Between 2013 and 2017 the trend is growing at an average annual rate of 7 %. These incomes represented 2.4 % of GDP in 2017.

The following section aims to show the observed behavior of the telecommunications market in 2017, in relation to income, investment, human resources and subscriptions for the different telecommunications services. Additionally, considering that 10 years have passed since the promulgation of the General Telecommunications Law, an analysis of the main changes recorded in the industry in that period is included. This analysis can be accounted for through the indicators of the sector.

Evolution of the Telecommunications Market 10 Years after the Enactment of the General Telecommunications Law (LGT)

In general, the Costa Rican telecommunications market has presented a satisfactory performance in the last decade, which is reflected in the behavior of variables such as coverage, income generated, human resources absorbed and investment materialized in the sector. The figures presented here contrast with the information available generated by SUTEL in 2017: For 2008, it used the data recorded by the International

Telecommunications Union, and the National Institute of Statistics and Census.

In the case of income, it can be concluded that it doubled in the last decade, from ₡326,629 million colones in 2008 to ₡807,296 million colones during 2017. This represents an increase of ₡480,667 million colones and an accumulated growth rate of 106 %. This results in a higher contribution to the national production or Gross Domestic Product (GDP), since the proportion of income to GDP goes from 2.08 % in 2008 to 2.5 % in 2017.

In relation to human resources, the personnel hired and directly related to the activity of telecommunications, went from 6,694 in 2008 to 12,186, which represents a cumulative growth rate of 69 %. It is worth noting that the female staff working in telecommunications has gone from 1,541 women, according to the records of 2008, to 3,344 women in the year 2017, which represents a cumulative growth rate of 90 %.

Another important variable that shows the growth of the telecommunications market is the investment made by the operators. In 2008 there were only 2 operators, the Costa Rican Electricity Institute (ICE)



and the Costa Rican Radiographic Company S.A. (RACSA, which, in fact, belongs to the same economic group), which recorded direct investments in the sector of \$160,440 million colones, at the end of the year 2017, with 143 operators authorized to provide services. The reported annual investment amounted to \$280,562 million colones, with a cumulative growth rate of 64 % in the annual investment. This growth is related to the availability of a greater commercial offer, from custom made plans, to bundled services.

Mobile telephony

10 years after the LGT was enacted, the market of mobile telephony in Costa Rica is very different compared to the year 2008, when the commercial offer to Costa Ricans was limited to a single operator. This, added to the existing coverage of the service in a monopoly environment, allowed that on average only 69 of every 100 inhabitants had access to mobile telephony services. However, 10 years later, Costa Rica has five providers (three operator owners of the network and two virtual mobile operators), which has resulted in an average of 179 out of every 100 inhabitants accessing this service. Thus, the annual growth composed of subscriptions from 2008 to 2017 is 19 % per year, reaching 8,840,342 subscriptions (see [graph N° 1](#)).

The above is a very important aspect for Costa Rica, because it guarantees a substantial reduction of the access gap to this service. The data allows us to infer that mobile telephony today is present in any social, economic and geographical stratum, and this is seen in the fact that, for 2008, 69 % of homes had at least one mobile phone, while for 2017 this number is around 96 %.

In terms of consumption, the total traffic of voice minutes increased, on average, by 7 % per year, and went from 3,533 million minutes to 6,579 million. This growth occurs despite the telecom boom via OTT applications that, in general, have led to a substitution of the use of voice for data ([see graph N° 2](#)).

As conclusion, Costa Rica now has a mature market in terms of mobile telephony, which has given rise to the fact that, on average, all the inhabitants and households have mobile telephony and, furthermore, it is a competitive market that benefits in terms of

quality, coverage, offer, promotions, access and prices to consumers.

Fixed Telephony

The opening of the telecommunications market has resulted in two effects on the behavior of the fixed telephony service. In the first place, there is a substantial reduction in the number of subscribers of the mobile telephony service by circuit switching (traditional basic telephony), explained by the availability of other telecommunications services, in particular mobile telephony and fixed telephony over the Internet protocol (VoIP). The effect of this substitution is evident if we consider the number of subscribers of the traditional basic telephony service, which decreased from 1,038,428 in 2008 to 74,728 in 2017. In this regard, see [table N° 11](#).

Ten years after the promulgation of the LGT, the Costa Rican market has reached an important level of maturity as a result of greater dynamism in the offer and the change in likings and preferences of users.

The second noteworthy effect in this decade in fixed telephony has to do with the appearance of the VoIP service, a consequence not only of the opening of the market that allows the participation of new operators in the provision of telecommunications services, but also of technological advances that facilitate the provision of telephony service through the Internet protocol. The number of fixed VoIP connections was null in 2008; by 2014, it had already reached 41,249 subscriptions, and in 2017 amounted to 82,230.

The variations in the telephone traffic of the service have been consistent with the behavior of the subscriptions of the service, according to the type of connection (traditional basic and VoIP). In this sense, while for traditional basic telephony there is a decrease in the number of minutes sent through the network, the VoIP service has seen its demand increase, reaching 296 million minutes in 2017, as it can be seen on [table N° 12](#).



The reduction of minutes in traditional basic telephony is 44.6 % in the period 2008-2017.

Data Transfer

The data transfer service has grown due to the commercial opening and the consequent expansion of the service offer. In particular, network operators and fixed Internet service providers improved their platforms and promotional packages, in this way, a greater number of citizens have benefited from the use of the Internet during the last 10 years.

It is important to indicate that, within data transfer, the mobile internet sub-service is without any doubt, the service that has experienced the greatest change in terms of coverage and in the number of subscribers, which went from 13 % penetration in 2010¹ to 97 % for 2017 (product of the largest offer of service providers in mobile telephony). This subservice at the global level is taking an important turn, given its capacity for technological transformation and for the needs of telecommunications users, and Costa Rica is part of this transformation, reflected both in its increase in subscriptions and in the traffic.

Television by Subscription

Regarding subscription television service, its evolution during the period 2008 - 2017 shows a growing trend both for the total subscriptions and for the percentage of homes that have this service. In the case of subscriptions, they increased from 398,792 in 2008 to 831,907 in 2017, which implies a cumulative growth rate of 77 % in this period. However, this growth is marked by two stages. The first, from 2008 to 2014, where the average annual growth rate was 11 % and the second from 2014 to 2017, where the rate is 4 %.

In parallel, the indicator corresponding to the percentage of households with this service reveals how, also, two behaviors are showed in the reference period. Given that in 2008, the percentage of homes that had this service was 32.6 %, and for 2014 of 61.9 %, an increase of 29 percentage points is identified. This behavior differs from that recorded in the period of 2014-2017, when the increase was seven percentage points, to end 2017 with 69 % of homes with the subscription television service.

Commercial Offer of Telecommunications Services in 2017

At the end of 2017, 143 operators and providers of telecommunications services were recorded, which showed an increase of 8 operators and suppliers compared to the number recorded in 2016 and 26 compared to 2013. It is important to note that the market continues to show growth in the number of companies interested in providing telecommunications services.

Penetration for mobile Internet grew from 13 % in 2010 to 97 % in 2018.

An interesting figure in this particular is the increase in the penetration of the fixed Internet, which, in 2008, reached 4.14 per 100 inhabitants. At that, time 183,481 subscriptions were counted, including 76,071 subscriptions through Dial-up technologies.

Almost ten years later, this technology has become a technological legacy, and low speed connections are no longer offered on this platform. In contrast, penetration has increased to 15.04 per 100 inhabitants, for a total of 744,059 subscriptions, on HFC, xDSL, FTTx networks and with wireless technologies.

It should be added that the advance is not only important in penetration and coverage, but in the performance of the service, with the increase in connection speeds and the number of clients that hire these speeds. For example, in 2008 a total of 97,833 users took advantage of connections between 256 kbps and 2 Mbps, compared to 4,405 users with speeds of 2 Mbps and 10 Mbps: Out of the 18,341 users recorded in 2008, only one 2.4 % enjoyed speeds greater than 2 Mbps. In 2017, this situation varied: Users with speeds between 256 kbps and 2 Mbps increased to 203,556. Similarly, connections between 2 Mbps and 10 Mbps, increased to 474,054. This denotes that the connections in this last range for 2017 represent 63.7 %. An increase in absolute terms of 469,649 users.

¹First official data recorded at the International Telecommunications Union



In relation to the number of operators that provided information during the analysis period, according to the service they provide, in the case of fixed telephony 90 % of active operators reported information, mobile telephony 100 %; data transfer 55 %; and television by subscription 97 %. In the case of data transfer, the operators that contributed information are those that have the highest market share.

The authorized services that were not contemplated in this report are the following: Geolocation, videoconference and trunking, since these services require a radio frequency concession for private commercial use, so the telecommunications network used to provide these services are of a private nature and are not interconnected with public telecommunications networks. For this reason, they are not considered services available to the public.

Behavior of the Income of the Telecommunications Sector

In the first instance, the behavior of the total income of the telecommunications sector is analyzed, and the detail is shown on [graph N° 6](#). Thus, for 2017 the market recorded \$807,296 million colones, an increase of 4 % compared to 2016. When analyzing the period 2013-2017, the growing trend continues with an average growth rate of 7 % annual in 5 years.

On the other hand, by constructing the relationship between the total income of the sector and the Gross Domestic Product at market prices ([graph N° 7](#)), for 2017 a ratio of 2.4 % is obtained. When comparing it with 2016, it shows a slight decrease (-0,01 percentage points).

Regarding the behavior of income at the service level ([graph N° 8](#)), in general terms it is observed that only the fixed telephony service (traditional basic and VoIP) shows a slight decrease. Both Internet access services and dedicated lines show growth, and mobile telephony remains constant.

When analyzing each service separately, it presents the following scenario:

Mobile Telephony

When considering income from voice and messaging traffic, \$347,492 million colones is reported for 2017,

which represents a decrease of -0.1 %, compared to 2016. For the 2013- 2017 period, the average annual growth rate is 3 %, as detailed in [graph N° 8](#). From the income reported in mobile telephony, it appears that 96.8 % are from voice traffic, and 3.2 % from messaging.

Fixed Telephony (Traditional Basic and VoIP)

For the fixed telephony service (basic traditional and VoIP telephony), during 2017, \$79,695 million colones were recorded, which represents a decrease of -8.9 % in the income generated compared to the year 2016. This service has shown a downward trend over the years, due to the decrease in its use, which is evident when analyzing the average growth rate for the period 2013-2017, meaning -0.2 % on an annual average. However, it is important to note that, by separating this service in traditional basic and VoIP telephony, the behavior is different; in traditional basic telephony, the trend is decreasing, but it is increasing for VoIP telephony.

Traditional Basic Fixed Telephony

The traditional fixed telephony has had a decreasing behavior in the analysis period. Compared to 2016, income have decreased by 10 % and the annual average growth rate is negative with 1.1 %. Even so, the relative weight of this service in relation to the total of basic telephony is still very important, with 92.5 %.

VoIP Fixed Telephone

The behavior of VoIP fixed telephony is different from basic telephony. This service has a growing trend throughout the analysis period. Compared to 2016, the increase is of 8.9 %, and the average annual growth rate since 2013 is 30.9 %.

Internet Access (Includes Mobile Internet Access)

In the case of the Internet access service, income shows a growing trend since, for the period 2013-2017, the average annual growth rate was 16 %. For 2017, Internet access generated, as a whole, 335.136 million colones, which represents an increase of 9.8 % compared to 2016. This shows the growth in the intensity of use of this type of service. It is important to highlight that the income from fixed Internet represents 38 %, and mobile Internet, 62 %. In this sense, mobile Internet shows a greater



dynamic, with an average annual growth rate of 17 %, while fixed Internet shows 13 % growth.

Dedicated Lines

Like the Internet access service, the income generated in the dedicated line service have also shown an increasing behavior in the period of analysis. For the year 2017, \$44,974 million colones were reported. This represents an increase of 30.6 % compared to 2016. In this case, the growth rate in the period from 2013 to 2017 is 2 % per year.

When analyzing the percentage weights of the income of each service, in relation to the total income of the sector, two scenarios are presented: the first one integrates the income of mobile telephony and mobile internet (mobile network) in the same area, followed by fixed Internet access, traditional telephony and VoIP telephony and, finally, dedicated lines ([graph N° 9](#)). Regarding the second scenario, the access income of fixed Internet and mobile Internet are added to a single revenue line, followed by mobile telephony (voice only), traditional telephony and VoIP telephony and, lastly, dedicated lines ([graph N° 10](#)).

In the case of the first scenario, it is shown that the mobile telephony service and mobile internet access (mobile network) represent 69% of income for 2017. This percentage is similar for the last 3 years. In second place, there is the fixed internet service, with 16%, followed by traditional basic telephony and VoIP telephony with 10% and dedicated lines with 5%. The large percentage weight that telecommunication services have over mobile networks is evident, where they represent almost three quarters of the market.

In relation to the second scenario, the mobile telephony service (voice only) has 43% of the income of the telecommunications market, followed by Internet access (fixed and mobile) with 41%. In the fixed telephony has 10%, and dedicated lines, 6%. In this instance, the mobile telephony and internet access service cover 84% of the sector's income.

Behavior of Subscriptions in the Telecommunications Sector

An important aspect in the telecommunications market is to analyze the behavior of subscriptions in the different services. On this subject, the detail can be seen on [table](#)

[N° 15](#) that shows information on the level of penetration of services measured by number of inhabitants or households for the period of analysis (2013-2017).

Mobile Telephony

The mobile telephony service recorded 8,840,324 subscriptions in 2017. For the prepaid modality, 6,795,591 were recorded, and for postpaid 204,4751 were recorded, with a percentage of 77 % and 33 % respectively, over the total. This service continues to show significant growth through the analyzed period. For example, 509,678 new subscriptions were placed in the last year, which represented a 6 % growth, compared to 2016. The penetration of this service in 2017 is 179 %, an increase of 9 percentage points compared to what was recorded in 2016.

Fixed Telephony (Traditional Basic and VoIP)

In the case of fixed telephony, the indicators of the number of subscriptions show a decrease: They go from 849,829 in 2016, to 843,148, in 2017. This represents a decrease of 6,678 subscriptions (1 %). In relation to the penetration of the service in the population and housing, it is found that, for 2017, it is 17 % and 56 %, respectively.

When separating the traditional basic telephony and VoIP telephony, it is shown that the decrease is focused on traditional basic telephony, where 12,857 less subscriptions were recorded compared to 2016 (2 %); but, in the VoIP telephony service there is an increase of 6,179 subscriptions (9 %).

Traditional Basic Fixed Telephony

Subscriptions of traditional fixed telephony are decreasing. This is shown in the behavior of the last 5 years: for 2017, 747,428 subscriptions were recorded, 188,604 less than those recorded in 2013 (936,035), with an average rate negative annual rate of 4 %.

VoIP Fixed Telephone

In the case of VoIP fixed telephony, it shows an increasing trend throughout the analysis period, with an average annual growth rate of 20 %: For 2017, there were 82,230 subscriptions; when compared to those recorded in 2013 (32,424), it represents 49,806 new subscriptions.



Internet Access (Includes Mobile Internet Access)

The Internet access service (fixed and mobile) shows a significant growth in subscriptions. Thus, for 2017, 5,333,005 were recorded, which represents 560,834 new subscriptions. By separating subscriptions on the fixed and mobile Internet, the mobile service represents 87 % of Costa Rica's Internet links. The penetration of fixed Internet in homes is 50 %, an increase compared to 2016 of 7 percentage points. In the case of the penetration of mobile Internet in the population, the percentage is 97 %, with an increase of 8 percentage points compared to 2016.

Dedicated Lines

The behavior of the subscriptions of the service of dedicated lines has been variant during the period of analysis, but for 2017, the greatest amount of connections was recorded (18,486).

Total Investment

The total investment of the telecommunications sector in the course of the last 5 years shows stability when analyzed as a proportion of GDP, so that it remains around 0.9 % as detailed in [graph N° 11](#). However, it is important to mention that, during 2017, an increase of 0.2 percentage points is shown, compared to the same indicated for 2016.

In this sense, when comparing the total investment of the sector with the Gross Formation of Fixed Capital, which statistically measures the value of the acquisitions of new or existing fixed assets minus the assignments of fixed assets made by the business sector, governments and households (excluding its unincorporated companies) that is included in the GDP. As it can be seen on [graph N° 12](#), the weight of this variable reaches 5 % for 2017. When this indicator is compared with that recorded in the previous years it can be seen that, in 2017, the highest percentage of the period is reached. Thus, in the analysis period, the relationship has remained oscillating between 4.6 % and 4.7 %, with a fall to 3.6 % during the year 2016 to finally rise to 5 % in 2017. This affirms the growth of the investment in the last year of analysis.

Engaged Human Resource

In the case of the human resource directly associated with telecommunications services, it continues to show sustained growth. For the last year, the staff increased by 301 people, which represents a 2 % growth compared to 2016. When estimating the growth as of 2013, a 4 % is obtained. This shows that the human resource directly related to the benefit of telecommunications services continues to rise (see [graph N° 13](#)). When comparing the human resource of the sector in relation to the labor force of the country, the indicator shows a slight decrease in comparison with 2016, but always with stability throughout the period of analysis (see [graph N° 14](#)). In the case of the labor force of the sector and the total population, as shown in [graph N° 15](#), it does not show significant changes over time; the result is constant with a slight increase in the last year.

Investment of the sector reaches 0.9 % of the GDP in 2017.

When analyzing the behavior of the female population working in telecommunications, an increase of 9 percentage points can be noted, compared to 2016, with a cumulative growth rate of 15 % in relation to 2013, which shows the tendency to rise in the last 4 years.

National Telecommunications Fund (FONATEL)

To fulfill the objectives of the National Telecommunications Fund (FONATEL), included in the General Telecommunications Law (Law 8642), SUTEL / FONATEL has created a portfolio of programs and projects aimed at extending access and use of services of telecommunications.

The development of this portfolio began in 2012 with the formulation of the Connected Communities Program (*Comunidades Conectadas*). In 2015, the process started for the formulation of the Connected Homes Program (*Hogares Conectados*). In 2016, the Connected Public Centers (*Centros Públicos Conectados*) Program started, and the Connected Public Spaces (*Espacios*



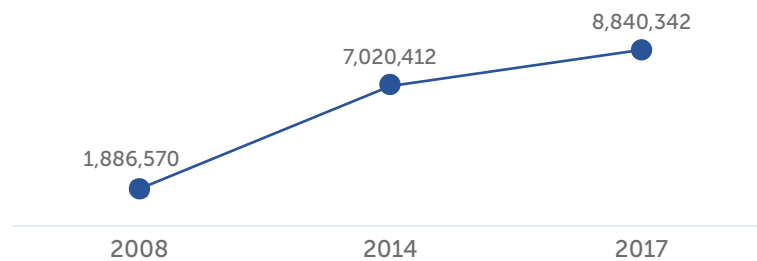
Públicos Conectados), Broadband Solidarity (*Banda Ancha Solidaria*) and Connected Citizens (*Ciudadanos Conectados*) programs started in 2017. Currently, the FONATEL portfolio is made up of 6 programs and 36 projects. 3 programs and 15 projects are currently in the production phase or generating benefits for the target population.

The data above represents an accumulated investment of ₡20,452 million colones. 2017 is the year with the record of highest disbursement; ₡12,782 million colones (62 % of the total budget executed).

The total value of FONATEL is ₡171,551 million colones, which highlights the impact of the investments done during the last quarter of 2016 and the collection of the Special Parafiscal Contribution (CEPF). The annual increase in collection is in line with the growth of the Telecommunications sector. After a stagnation in the collection for the years 2013 and 2014, there was a strong increase in income from this contribution. This is the result of the support management in the collection between the General Directorate of Fonatel and the General Directorate of Taxation.

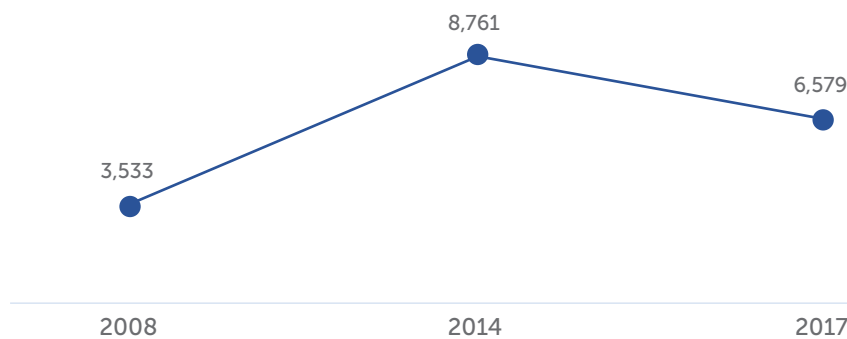


Graph N° 1
Costa Rica. Subscriptions of Mobile Telephony Service, 2008-2014-2017
(End-of-year figures)



Source: International Telecommunications Union and SUTEL, General Directorate for Markets.

Graph N° 2
Costa Rica. Voice national traffic, Mobile Telephony Service, 2008-2014-2017
(Yearly Figures in million of minutes)



Source: International Telecommunications Union and SUTEL, General Directorate for Markets.

Table N° 11
Costa Rica. Subscriptions of traditional basic telephony and VoIP telephony,
2008, 2008, 2014 y 2017
(Figures at the end of each year)

| Subscriptions | 2008 | 2014 | 2017 |
|-----------------------------|-----------|---------|---------|
| Total | 1,038,428 | 881,217 | 829,658 |
| Traditional basic telephony | 1,038,428 | 839,968 | 747,428 |
| VoIP | --- | 41,249 | 82,230 |

Source: SUTEL, General Directorate for Markets.



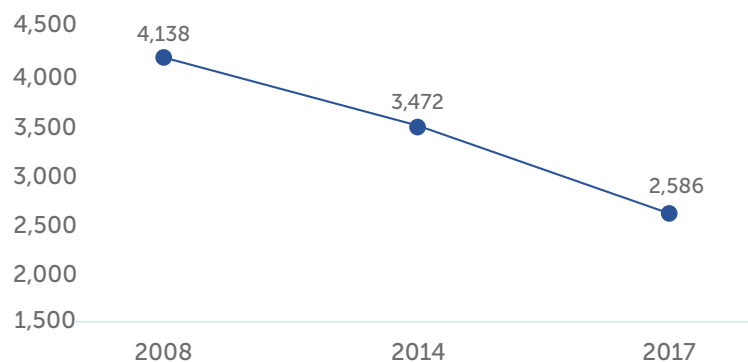
Table N° 12
Costa Rica. Traffic of traditional basic telephony and VoIP telephony, 2008,
2014 y 2017

(Annual figures in millions of minutes and percentages variation)

| Indicator | 2008 | 2014 | 2017 |
|-----------------------------|-------|-------|-------|
| Minutes | 4,138 | 3,472 | 2,586 |
| Traditional Basic Telephony | 4,138 | 3,299 | 2,290 |
| VoIP | --- | 173 | 296 |

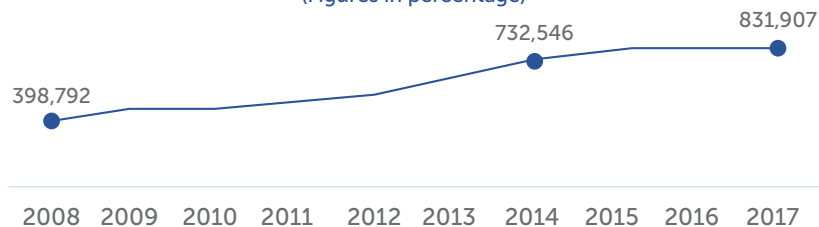
Source: SUTEL, General Directorate for Markets.

Graph N° 3
Costa Rica. Costa Rica. Traffic of fixed telephony, 2008 – 2014 – 2017
(Millions of minutes per year)



Source: SUTEL, General Directorate for Markets.

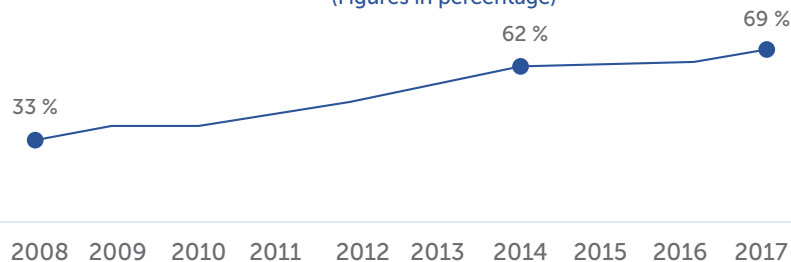
Graph N° 4
Costa Rica. Pay TV subscriptions
2008 – 2017
(Figures in percentage)



Source: SUTEL, General Directorate for Markets.

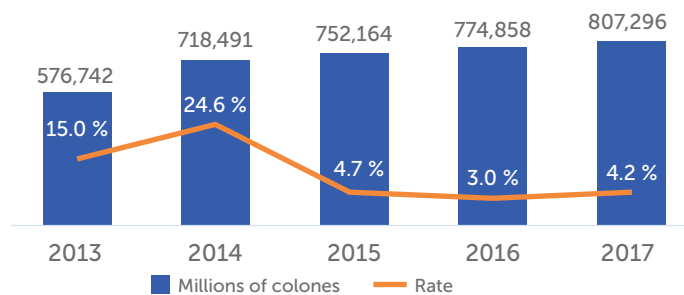


Graph N° 5
Costa Rica. Percentage of homes with Pay TV
2008 – 2017
(Figures in percentage)



Source: SUTEL, General Directorate for Markets.

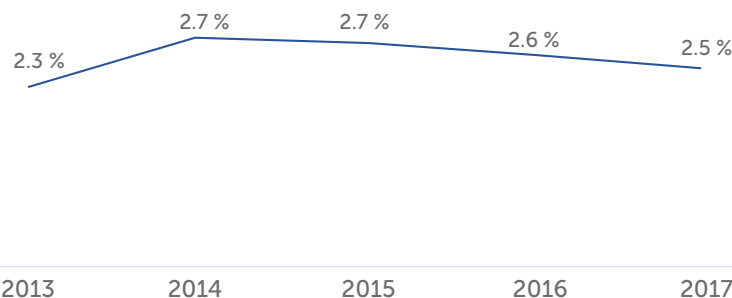
Graph N° 6
Costa Rica. Total income of telecommunications 2013 – 2017
(Yearly figures in millions of colones and percentage of variation)



The telecommunications market has generated
807,296
million colones during 2017.

Source: SUTEL, General Directorate for Markets.

Graph N° 7
Costa Rica. Total income of telecommunications sector, as proportion of the GDP 2013-2017
(Yearly figures percentages)



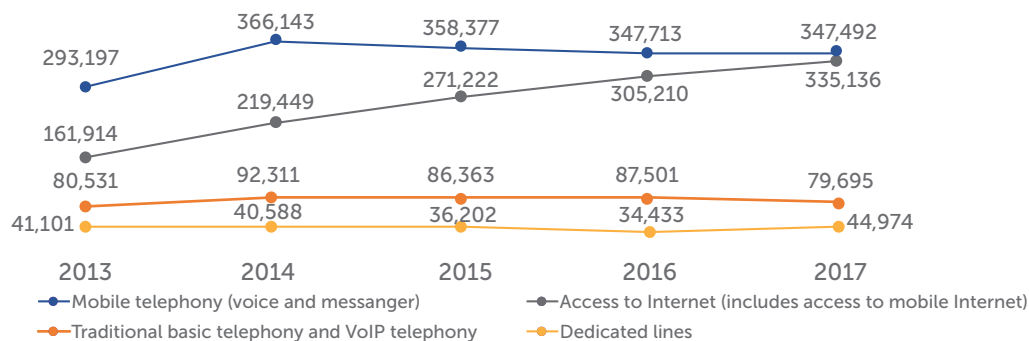
Note: %/Gross Domestic Product at current market prices.

Source: SUTEL, General Directorate for Markets and Central Bank of Costa Rica (BCCR)



Graph N° 8
Costa Rica. Total income of telecommunications sector, per service
2013-2017

(Yearly figures in millions of colones)

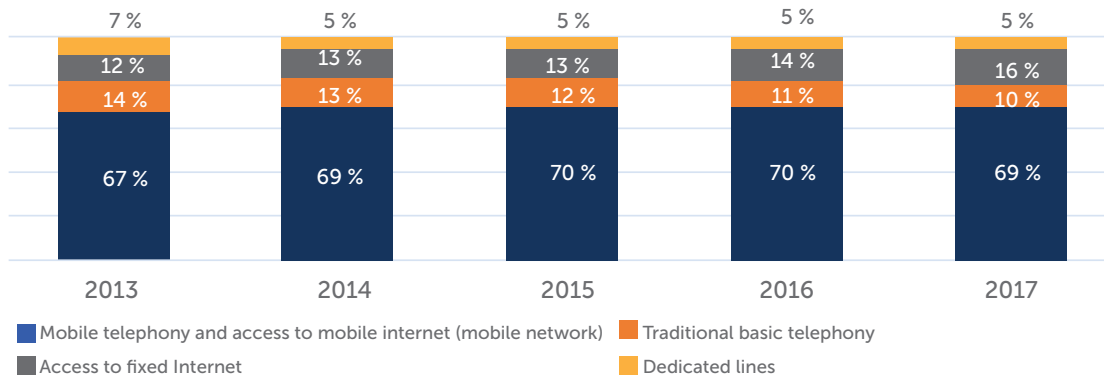


Graph N° 9
Costa Rica. Total income of telecommunications sector per service,
2013-2017

(Yearly figures in percentage)

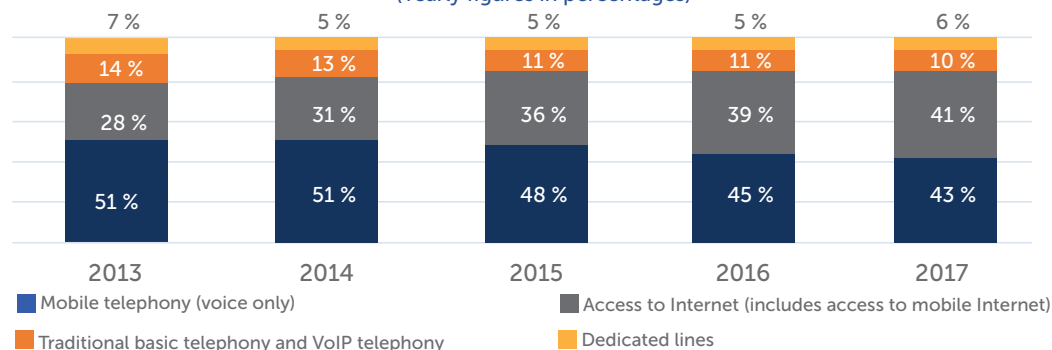
The mobile telecommunications service represents

69 %
of income.



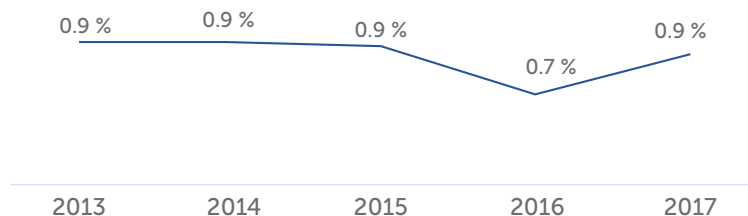
Graph N° 10
Costa Rica. Total income of telecommunications sector, per service
2013-2017

(Yearly figures in percentages)



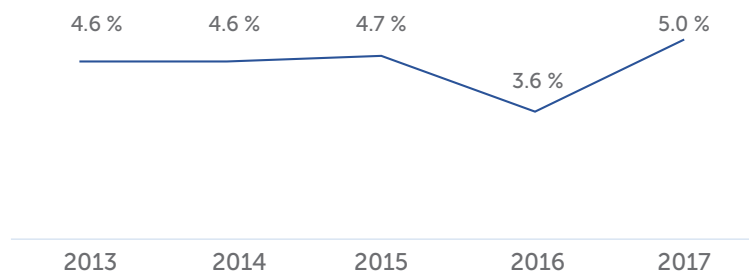


Graph N° 11
Costa Rica. Total investment of telecommunications sector, as portion of the GDP¹, 2013-2017
(Yearly figures in percentage)



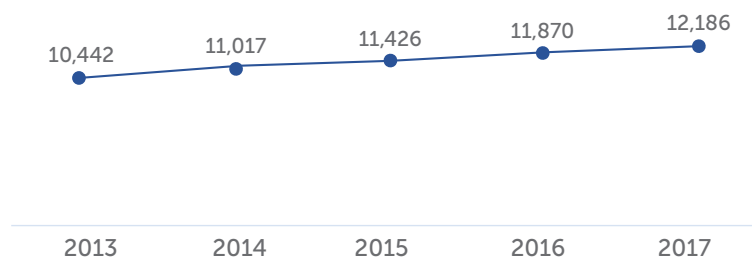
Note: ¹/Gross Domestic Product at current market prices.
Source: SUTEL, General Directorate for Markets.

Graph N° 12
Costa Rica. Total investment of telecommunications sector, as proportion of the Gross Formation Capital 2013-2017
(Yearly figures in percentages)



Source: SUTEL, General Directorate for Markets.

Graph N° 13
Costa Rica. Work force of telecommunications sector 2013-2017
(Yearly figures)

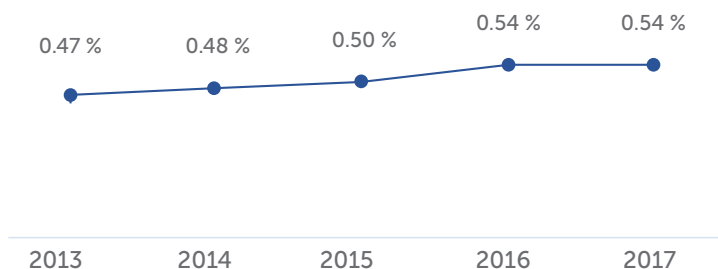


Source: SUTEL, General Directorate for Markets.



Graph N° 14

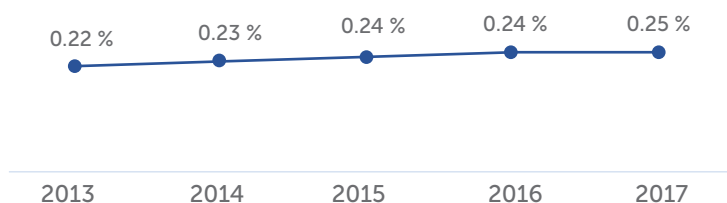
Costa Rica. Percentage of work force of telecommunications sector compared to the economically active population, 2013-2017
(Yearly figures in percentages)



Source: SUTEL, General Directorate for Markets.

Graph N° 15

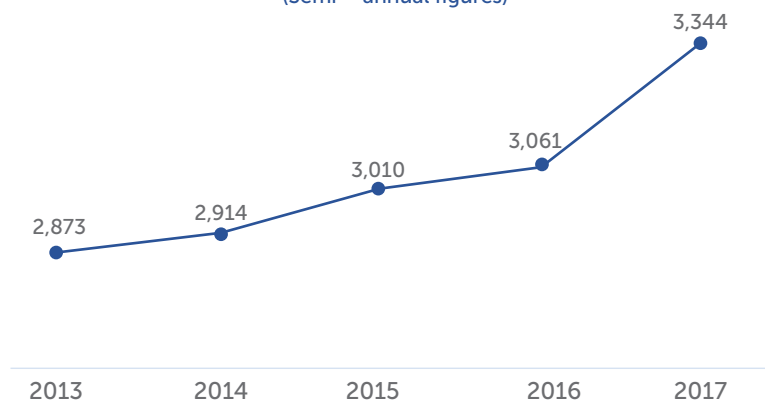
Costa Rica. Percentage of work for of the telecommunications sector compared to the total population, 2013-2017
(Yearly figures in percentages)



Source: SUTEL, General Directorate for Markets.

Graph N° 16

Costa Rica. Female work force in the telecommunication sector, 2013-2017
(Semi – annual figures)

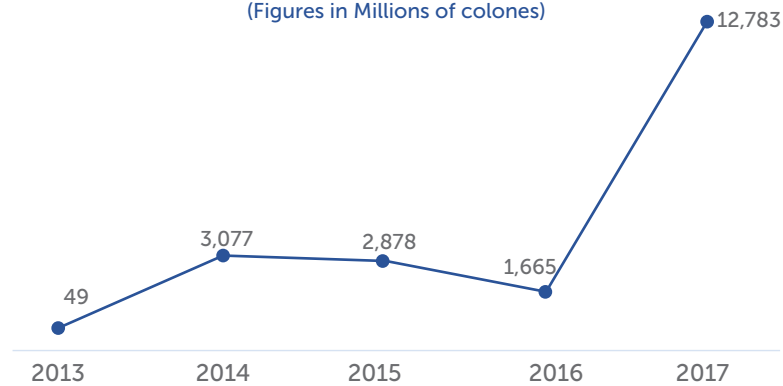


Source: SUTEL, General Directorate for Markets.



Graph N° 17
Costa Rica. Investment in the Yearly Plan of Projects and Programs of FONATEL,
2013-2017

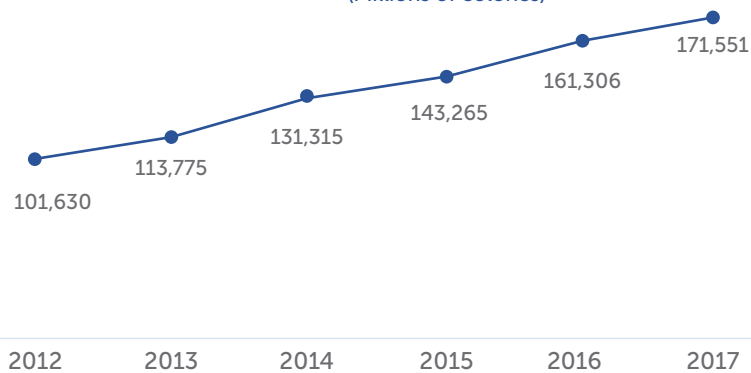
(Figures in Millions of colones)



Source: SUTEL, General Directorate for FONATEL.

Graph N° 18
Costa Rica. Value of FONATEL 2012-2017

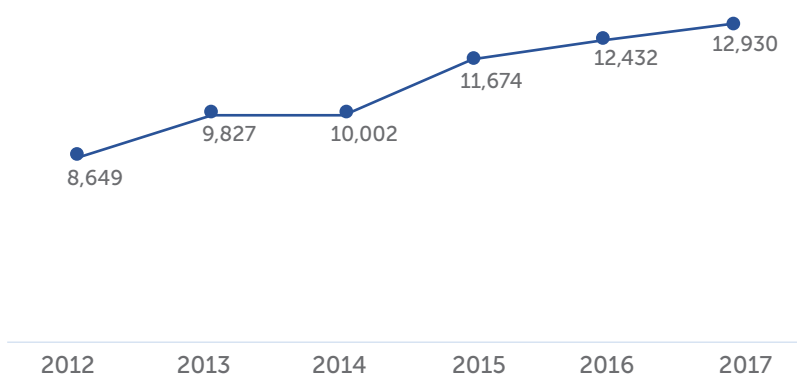
(Millions of colones)



Source: SUTEL, General Directorate for FONATEL.



Gráfico N° 19
Costa Rica. Collection of the Parafiscal Special Contribution, 2012-2017
(Millions of colones)



Source: SUTEL, General Directorate for FONATEL.

Chart N° 13
Costa Rica. Number of Operators and providers of telecommunications services, 2013 - 2017

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------------------|------|------|------|------|------|
| Total authorized companies | 117 | 122 | 139 | 135 | 143 |
| Response rate indicators | 84 % | 84 % | 88 % | 83 % | 80 % |

Source: SUTEL, General Directorate for Markets.

Table N° 14
Costa Rica. Percentage distribution of companies by service included in the sector indicators report 2013 - 2017

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|------------------|-------|-------|-------|-------|-------|
| Fixed telephony | 92 % | 94 % | 94 % | 94 % | 90 % |
| Mobile telephony | 100 % | 100 % | 100 % | 100 % | 100 % |
| Data transfer | 97 % | 98 % | 97 % | 97 % | 55 % |
| Pay TV | 100 % | 100 % | 100 % | 100 % | 97 % |

Source: SUTEL, General Directorate for Markets.



Table N° 15
Costa Rica. Summary of indicators on the performance of the Costa Rican
Telecommunications sector,
2013-2017

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|------------|------------|------------|------------|------------|
| Aggregated data of the sector | | | | | |
| Total income (millions of colones) | 576,742 | 718,491 | 752,164 | 774,858 | 807,296 |
| Total income / GDP (percentage) | 2.34 % | 2.69 % | 2.68 % | 2.58 % | 2.48 % |
| Total investment / GDP (percentage) | 0.91 % | 0.93 % | 0.90 % | 0.67 % | 0.86 % |
| Total employed human resource | 10,442 | 11,017 | 11,426 | 11,870 | 12,186 |
| Total employed human resource / Total economically active population | 0.47 % | 0.48 % | 0.50 % | 0.54 % | 0.54 % |
| Fixed telephony | | | | | |
| Total subscriptions | 968,459 | 881,217 | 859,857 | 849,826 | 829,658 |
| Total subscriptions / 100 inhabitants | 21 % | 18 % | 18 % | 17 % | 17 % |
| Total subscriptions / 100 homes | 72 % | 63 % | 60 % | 58 % | 55 % |
| Total subscriptions basic traditional fixed telephony | 936,035 | 839,968 | 804,468 | 779,972 | 747,428 |
| Subscriptions total traditional basic fixed telephony / 100 inhabitants | 20 % | 18 % | 17 % | 16 % | 15 % |
| Subscriptions total traditional basic fixed telephony / 100 homes | 69 % | 60 % | 56 % | 53 % | 50 % |
| Total subscriptions Vo IP | 32,424 | 41,249 | 55,389 | 69,854 | 82,230 |
| Total number of public telephones | 13,145 | 8,188 | 5,726 | 4,731 | 4,674 |
| Mobile telephony | | | | | |
| Total subscriptions | 7,059,471 | 7,020,412 | 7,535,599 | 8,330,664 | 8,840,342 |
| Prepaid Subscriptions | 5,831,878 | 5,598,911 | 5,951,337 | 6,468,693 | 6,795,591 |
| Postpaid Subscriptions | 1,227,593 | 1,421,501 | 1,584,262 | 1,861,971 | 2,044,751 |
| Total subscriptions / 100 inhabitants | 150 % | 147 % | 156 % | 170 % | 179 % |
| Prepaid subscriptions / Total subscriptions | 83 % | 80 % | 79 % | 78 % | 77 % |
| Postpaid subscriptions / Total subscriptions | 17 % | 20 % | 21 % | 22 % | 23 % |
| Data transfer | | | | | |
| Total subscriptions to Internet access | 4,028,302 | 4,806,217 | 4,713,075 | 4,972,171 | 5,533,005 |
| Total subscriptions fixed Internet access | 484,883 | 515,840 | 558,656 | 636,087 | 744,041 |
| Total subscriptions fixed-wire Internet access | 474,433 | 503,347 | 545,813 | 625,466 | 735,833 |
| Total subscriptions access to fixed-wireless Internet | 10,450 | 12,493 | 12,843 | 10,621 | 8,208 |
| Total subscriptions access to mobile Internet | 3,543,419 | 3,796,619 | 4,154,419 | 4,336,084 | 4,788,964 |
| Total subscriptions fixed Internet access / 100 inhabitants | 10 % | 11 % | 12 % | 13 % | 15 % |
| Total subscriptions fixed Internet access / 100 homes | 36 % | 37 % | 39 % | 43 % | 50 % |
| Total subscriptions mobile Internet access / 100 inhabitants | 75 % | 80 % | 86 % | 89 % | 97 % |
| Total subscriptions mobile Internet access / total mobile subscriptions | 50 % | 54 % | 55 % | 52 % | 54 % |
| Total number of dedicated line connections | 16,375 | 16,286 | 14,093 | 16,032 | 18,486 |
| Pay Television | | | | | |
| Total subscriptions | 641,042 | 732,546 | 797,230 | 821,575 | 831,907 |
| Total subscriptions / 100 inhabitants | 14 % | 15 % | 16 % | 17 % | 17 % |
| Total subscriptions / 100 homes | 48 % | 52 % | 56 % | 56 % | 56 % |
| Reference indicators | | | | | |
| Total population | 4,713,168 | 4,773,130 | 4,832,234 | 4,890,379 | 4,947,490 |
| Gross domestic product at market prices (millions of current colones) | 24,606,875 | 26,675,006 | 28,098,969 | 30,048,726 | 32,506,356 |
| Total housing | 1,348,036 | 1,399,271 | 1,436,120 | 1,465,259 | 1,496,053 |

Notes:

** These figures do not include income associated with Pay TV.

Source: SUTEL, General Directorate for Markets., INEC and BCCR



FIXED TELEPHONY





FIXED TELEPHONY

Access to other telecommunications services has the consequence that, in Costa Rica, the traditional basic telephony service is used to a lesser degree, which, however, does not occur with the VoIP service, whose subscribers and associated traffic have been increasing.

Subscribers

The downward trend shown by the number of subscribers of the fixed telephony service (traditional basic and VoIP) was maintained during the year 2017, which is consistent with that reported by SUTEL in previous years. In fact, while at the end of 2013 there were 968,459 clients, at the end of 2017 that number had been reduced to 826,658, as it is recorded on Table N° 55, corresponding to the Annex. It should be noted, however, that the rate at which the number of fixed telephony subscribers has decreased. This means an average reduction of 54,301 customers per year, for the 2014-2015 biennium, which is equivalent to 5.8 % per year. For the 2016-2017 period, there was an average annual decrease of 15,100 clients (1.8 %).

As indicated in previous reports, considering fixed telephony includes both the traditional basic telephony service and the voice over Internet protocol (VoIP) service, table N° 55 also shows a difference in behavior, over time, of the number of subscribers according to the connection technology. While traditional basic telephony shows a significant decrease in subscribers (the number of subscribers decreased from 936,035 in 2013, to 747,428 in 2017, an

average annual decrease of 5.5 %); in the VoIP service, the number of customers increased during that same period, from 32,424 to 82,230 subscribers; that is, an average increase of 26.2 % per year. Regarding the year 2017, while the VoIP service experienced an increase of 12,376 new subscribers, traditional basic telephony suffered a reduction of 32,544 customers (17.7 % and -4.2 % respectively). See [graph N° 20](#).

When analyzing the evolution of the number of subscribers per quarter, specifically for the last two years of the period analyzed (2016 and 2017), it is noticeable that the reduction of subscribers is persistent during the eight quarters analyzed. Since, as noted previously, the reduction of customers is associated with traditional basic telephony, it can be observed that, unlike the behavior shown by fixed telephony as a whole, the VoIP service shows a continuous growth of the number of subscribers during these last two years, which on average equals 5.1 % quarterly. The corresponding data are included on [table N° 56](#) of the Annex.

Because of this dissimilar behavior of the number of subscribers by type of connection (traditional basic and VoIP), the percentages of participation



of both technologies within the total number of subscribers have varied evidently, which in the annual perspective can be seen on both [Table N° 57](#) of the Annex and on [graph N° 21](#). If the analysis focuses on the quarterly performance of the last two years, it can be observed that, while basic telephony had 93.1 % of fixed telephony subscribers in the first quarter of 2016, and VoIP 6.9 %, for the fourth quarter of 2017, these percentages had varied to 90.1 % and 9.9 % respectively. These variations are shown on [table N° 58](#) of the Annex and on [graph N° 22](#).

Regarding the penetration of the traditional basic telephone service in the country, measured as the percentage of total users with respect to the total population of the country, the downward trend observed is manifested in a reduction of the respective percentage, which goes beyond 19.9 % in the year 2013, to 15.1 %, in 2017. This means a decrease of 199 traditional basic lines per one thousand inhabitants, to 151 lines per one thousand people. The corresponding figures can be seen on [table N° 59](#) of the Annex and [graph N° 23](#).

Meanwhile, the penetration of voice service over Internet protocol (VoIP) reached, in 2017, 16.6 lines per one thousand inhabitants. These variations are shown on [table N° 60](#) of the Annex and on [graph N° 24](#).

The distribution by operator of the subscribers of the VoIP service and its evolution in the last two years can be seen on [graphs N° 25](#) and [N° 26](#). Although Tigo continues to be the operator with the highest number of subscribers (29.4 % in 2016 and 27.1 % in 2017), the share that Cabletica has reached is remarkable (28.7 % in 2016, and 27 % in 2017), as well as the share Telefónica has reached (which went from 23.5 % in 2016, to 25.7% in 2017).

Since the public telephone service is provided using the traditional basic telephony infrastructure, it is relevant to analyze the number of public telephones available in the country and their evolution over time. The corresponding data indicate that, in accordance with the situation of fixed telephony, especially the traditional basic telephony, there is a decrease in the number of public telephones, which went from 13,145 at the end of 2013, to 4,676 in 2017. In that sense, the number of public telephones available in 2017 represents only 29 % of those installed in 2012 (16,348). As indicated in previous reports, this reduction in the

number of public telephones is associated with the lower need of the population of that service, due to the availability of other options, specially mobile telephony. The corresponding evolution can be seen on [table N° 61](#) of the Annex and on [graph N° 27](#).

Traffic

Along with the number of subscribers of the service, the telephone traffic sent through the fixed networks has been reducing over time, to such an extent that the 4,138 million minutes that passed through these networks in 2013 were reduced to 2,586 million minutes

VoIP traffic grew at an average annual rhythm of 39.8 % for the 2013-2017 period.

of traffic in 2017. That is, an average annual rate of reduction of 11.1 % has been recorded, a percentage that coincides with the reduction experienced during the last year (2017). The corresponding detail appears on [table N° 62](#) of the Annex and on [graph N° 28](#).

Opposite to the behavior shown by fixed telephony as a whole, due to what happened with traditional basic telephony, for the VoIP telephony service, the corresponding telephone traffic has been increasing as consequence of the consolidation of the service through these years, as shown on [table N° 63](#) of the Annex, associated to [graph N° 29](#). In this sense, the minutes sent through VoIP went from 77,532 minutes in 2013 to 295,964 minutes in 2017. In percentage terms, this variation implies an average annual growth of 39.8 %).

When considering quarterly data, specifically for the eight quarters corresponding to the last two years, it is evident the decreasing tendency shown by telephone traffic in the case of fixed telephony service in general. From the 736 million minutes that were transferred in the first quarter of 2016, traffic had been reduced to 636 million minutes for the fourth quarter of 2017; that is, an average quarterly decrease of 2.1 %. However, it should be noted that, contrary to the prevailing decreasing



trend, there were increases in fixed telephone traffic both in the second quarter of 2016 and in the fourth quarter of 2017. In this regard, refer to [table N° 64](#) of the Annex and [graph N° 30](#).

Regarding the VoIP service, the quarterly figures for the 2016-2017 period show a sustained growth during the first year, which contrasts with the reductions registered in the first three quarters of 2017. A significant increase occurred in the fourth quarter of 2017 (27.2 %) caused that the traffic of that quarter (84 million minutes) be the highest of those registered in the biennium analyzed. On average, this traffic increased by 5.6 % quarterly during the analyzed period ([table N° 65](#) of the Annex and [graph N° 31](#)).

An additional fact that is relevant in the fixed telephony traffic, refers to the average traffic per subscriber. In this regard, it should be noted that, while the case of traditional basic telephony, said average traffic per subscriber reached 4,338 minutes in 2013, in the year 2017 it was reduced to 3,063 minutes, which means an annual average of 11.5 %. The behavior of the VoIP service has been different. Therefore, from 2,398 minutes in 2013, the average increased to 4,253 minutes the following year, and decreased in subsequent years to a level of 3,599 minutes in 2017. Despite such reductions, the average VoIP service traffic has been higher than the corresponding average associated with traditional basic telephony. [See graph N° 34](#).

Income

The decrease registered by the number of subscribers and the reduction in traffic, analyzed previously; do not lead to a significant decrease in the income derived from the service provision, during the analysis period (2013-2017). Indeed, while in 2013 the fixed telephony generated 80,531 million Colones, in 2017 the corresponding income reached 79,695 million Colones, which is equivalent to a decrease of 1 % in the four-year period considered. It should be noted, however, that the low-income variation is not typical of each one of the years included in the analysis period. There was a significant increase for 2014, consequence of a rate adjustment approved by SUTEL¹, through Resolution RCS-268-2013 of September 18, 2013 and applied by the main fixed telephony service provider (the Instituto Costarricense de Electricidad) at the end of that year. This resulted in reductions in income in subsequent years: 6.4 % in 2015 and 8.9% in 2017. In that sense, in 2014 the corresponding income reached an amount of 92,311 million Colones that, later, decreased to 86,363 million Colones in 2015, until reaching in 2017 the 79,695 million Colones. A detail of the corresponding amounts and of the afore mentioned oscillating behavior can be seen on [table N° 66](#) of the Annex and on [graph N° 35](#).

Unlike the behavior shown by income from fixed telephony and particularly traditional basic services, incomes for VoIP have increased over time, as it has happened with the number of subscribers and telephone traffic.

Despite the strong reduction in the number of subscribers and in the traffic of fixed telephony, there is no significant reduction in the income coming from this service.

Similarly, in relation to the VoIP service, the information available allows the percentage distribution of telephone traffic by operator. In that sense, the distribution corresponding to 2016 showed that the three operators with the highest traffic concentrated 64.3 % of the transferred minutes. The data for 2017, meanwhile, show the evident increase on the proportion corresponding to these three operators, which reaches 72.2 %. However, although this variation in the participation of the different services of the service could be interpreted as a concentration of traffic, it is important to indicate that there is no coincidence in the three providers of the busiest service, and only one of the three that dominated traffic in 2016 reduced their participation in the transferred total. In general, the increase in call minutes of VoIP service during 2017 happened for most of the providers of this service. The corresponding distributions are detailed on [graphs N° 32 and N° 33](#).

¹ The afore mentioned tariff adjustment was done taking into account that in accordance with article 50 of the General Law of Telecommunications, Law No. 8642, "the rates of telecommunications services available to the public will be initially established by Sutel, in accordance with the methodology of price limit or any other methodology that encourages competition and efficiency in the use of resources, in accordance with the bases, procedures and periodicity that is defined by regulation."



This means an increase from 2,506 million Colones in 2013, to 5,918 million Colones in 2017. The increase is persistent over time, to such an extent that, during the five-year period analyzed (2013-2017); the average annual growth reached 30.9 %. The data can be seen on [table N° 67](#) of the Annex and on [graph N° 36](#).

Unlike what was observed for the entire analysis period, at the quarterly level and considering the last two years, it can be seen that fixed telephony income show a sustained decrease. Such income decreased from 22,445 million Colones in the first quarter of 2016 to 19,426 million Colones in the fourth quarter of 2017, which is equivalent to an average quarterly reduction of 2 %. The detail of the corresponding figures can be seen in [table N° 68](#) of the Annex and in [graph N° 37](#).

Regarding VoIP service income, corresponding to the eight quarters associated with the years 2016 and 2017, consistent with the growth experienced by the VoIP service, both in terms of number of subscribers and telephone traffic, a persistent quarterly growth is noticeable in income that, however, is interrupted in the second quarter of 2017. Income increased from 1,324 million Colones in the first quarter of 2016, to 1,514 million Colones during the first quarter of 2017. Later, they decreased to 1,440 million Colones in the second quarter. Although there were increases in the amounts corresponding to the following quarters, income for the fourth quarter of 2017 (1,500 million Colones) did not reach the value registered in the first quarter of that year. The corresponding data are included in [table N° 69](#) of the Annex and in [graph N° 38](#).

Based on the information available on income and the number of subscribers, the average income per user generated is obtained from the fixed telephony service providers (ARPU for its acronym in English). The afore mentioned average income per subscriber can be calculated both for all the services included in the fixed telephony, and for each of the different types of service considered as part of this telephone modality; that is, traditional basic telephony and VoIP service.

Concerning both fixed telephony and traditional basic telephony, the corresponding calculations show an average annual income per subscriber very similar over the period analyzed (2013-2017). For fixed telephony as a whole, the corresponding value varied between 83,000 and 105,000 Colones per year. Resulting of the afore mentioned tariff adjustment, said average income increased above 104,000 Colones in 2014 (26 %), and decreased from the following

year to lower amounts for 2017. The specific figures were 98,708 Colones in the case of traditional basic telephony and 96,058 Colones for fixed telephony in general. The corresponding detail can be seen on [table N° 70](#) of the Annex, which also includes the resulting figures from the VoIP service.

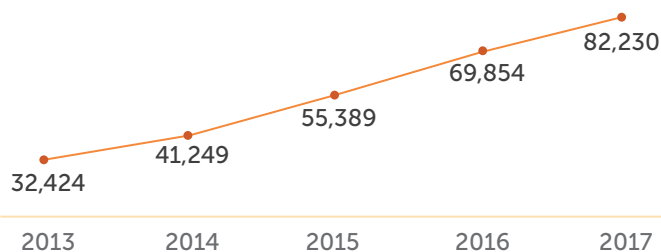
For VoIP, on the other hand, income per subscriber has shown a greater range of variation, with a significant increase from 2013 to 2014 (from 77,274 Colones to 104,368 Colones) and reductions in the following years, so that the value for 2017 (71,969 Colones) it is 31 % lower than that registered in 2014. See [graph N° 39](#).

The information available also allows obtaining the average per minute income for both the traditional basic telephony service and VoIP. The resulting values, included on [table N° 71](#) of the Annex, show a sustained decrease in the average price paid per minute by users of the VoIP service. As indicated in previous reports, it seems to be explained, in the first place, by the fact that these customers have access to Internet, therefore, they have the option of making international calls through Over The Top (OTT) platforms, which reduces the expenses for such concept and, therefore, the average expense in which incur the fixed telephone service. Additionally, it must be considered that the significant increase in the number of customers has meant, for VoIP providers, to provide the service to customers with increasingly lower consumption.

In the case of traditional basic telephony, the average price per minute shows an increase in 2014, which is, as indicated above, the rate increase implemented by the ICE at the end of 2013. The upward trend has been maintained in the following years, so that the resulting value for 2017 (32 Colones per minute without sales tax) exceeds the 2015 average by 19.3 % (27 Colones per minute). The referred behavior can be seen on [graph N° 40](#).

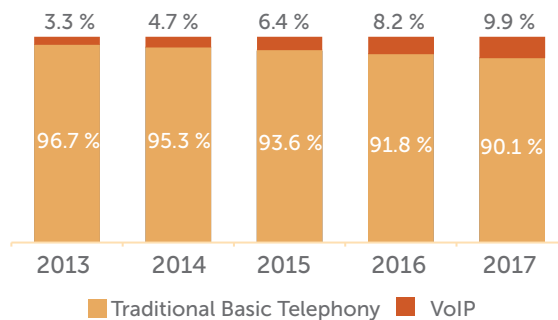


Graph N° 20
Costa Rica. Subscribers of VoIP, 2013-2017
(End-of-year figures)



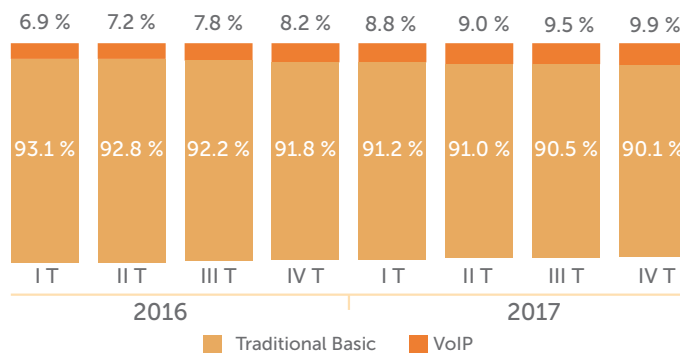
Source: SUTEL, General Directorate for Markets.

Graph N° 21
Costa Rica. Percentage Distribution of Traditional Basic
Telephony Subscriptions and VoIP 2013 - 2017
(End-of-year figures)



Source: SUTEL, General Directorate for Markets.

Graph N° 22
Costa Rica. Percentage distribution of traditional
basic telephony subscriptions and VoIP,
2016-2017
(End-of-quarter figures)



Currently, VoIP service
users represent nearly

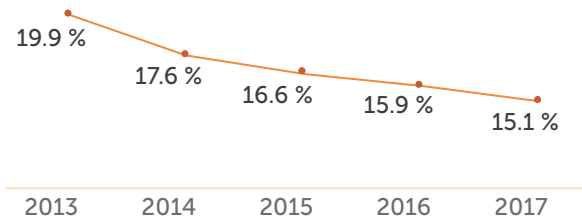
10 %

of the total of fixed
telephony service users.

Source: SUTEL, General Directorate for Markets.



Graph N° 23
Costa Rica. Penetration traditional basic telephony, 2013-2017
 (Connections with regards to total population and figures in percentages)



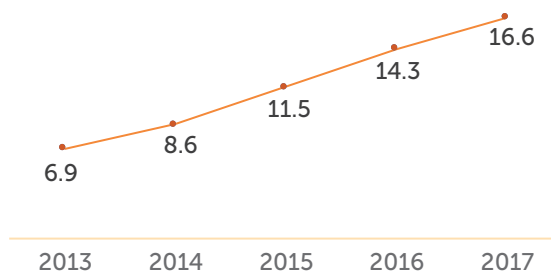
The continued decline experienced by the number of traditional fixed telephony users, explains the

15.1 %

of penetration of the service on 2017.

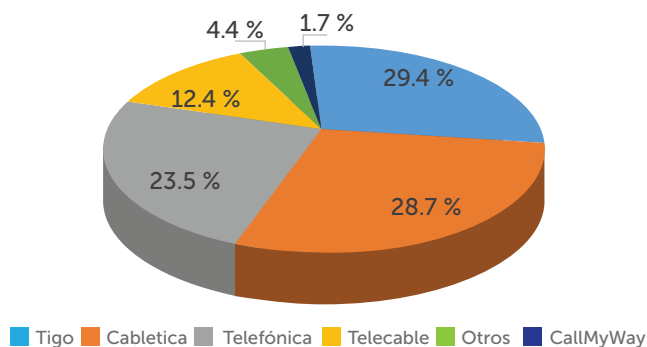
Source: SUTEL, General Directorate for Markets.

Graph N° 24
Costa Rica. Penetration of VoIP telephony, 2013-2017
 (Connections per each thousand inhabitants)



Source: SUTEL, General Directorate for Markets.

Graph N° 25
Costa Rica. Distribution per VoIP telephony operator of subscribers, December 2016
 (Figures in percentages)

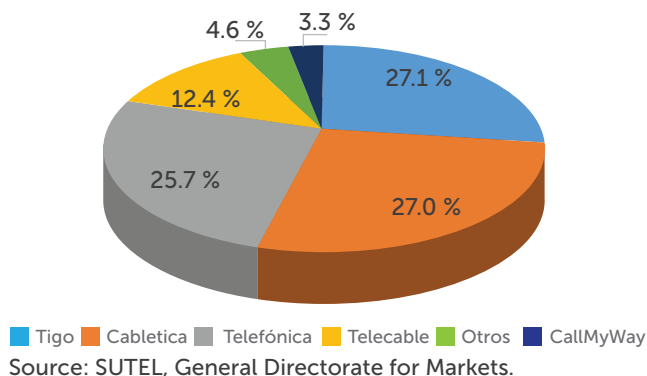


Source: SUTEL, General Directorate for Markets.

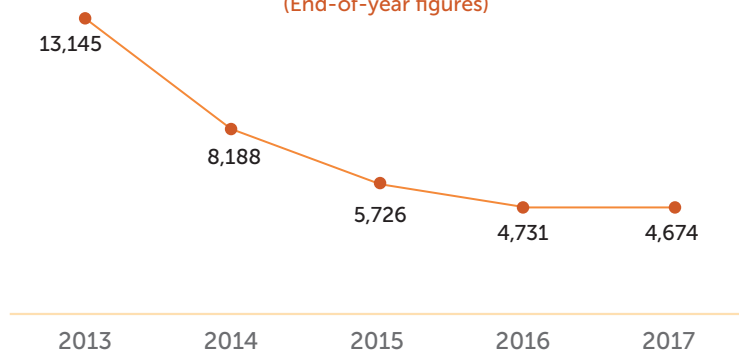
Graph N° 26
Costa Rica. Distribution per VoIP telephony operator of subscribers, December 2017
(Figures in percentages)

According to the number of subscribers, VoIP telephony market continues under the control of

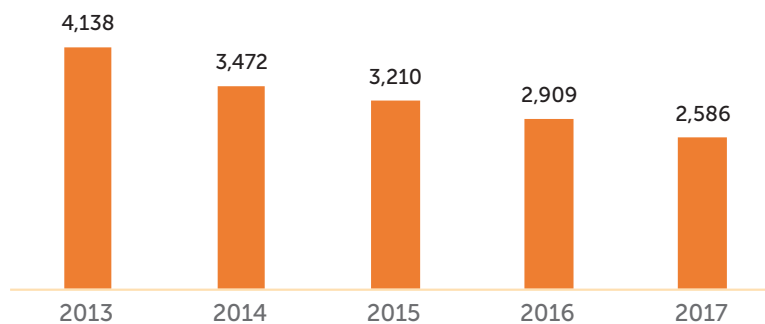
4
operators.



Graph N° 27
Costa Rica. Public devices, traditional basic telephony, 2013-2017
(End-of-year figures)



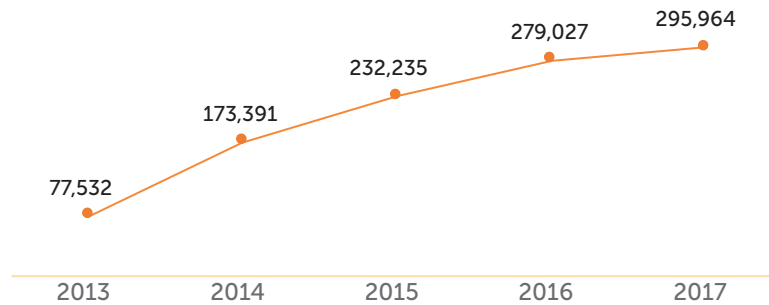
Graph N° 28
Costa Rica. Fixed Telephony Traffic, 2013-2017
(Millions of minutes per year)



According to the observed behavior in the number of subscribers in the basic traditional telephony, traffic of fixed telephony, as a whole, has **decreased** during the last four years.



Graph N° 29
Costa Rica. VoIP Telephony Traffic, 2013-2017
(Thousands of minutes per year)



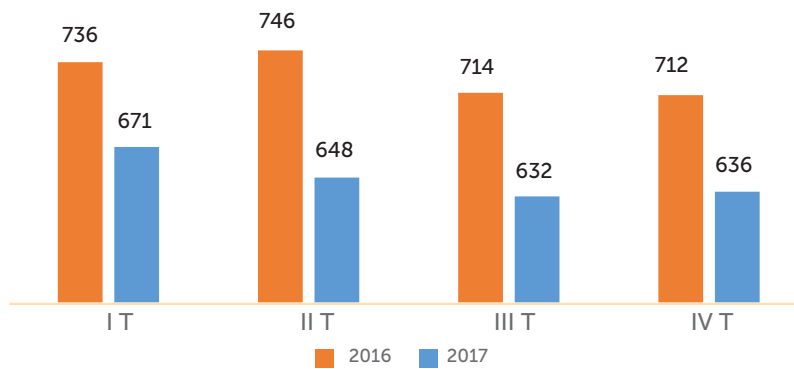
Unlike fixed telephony as a whole, VoIP service shows a sustained

growth

in the traffic over time.

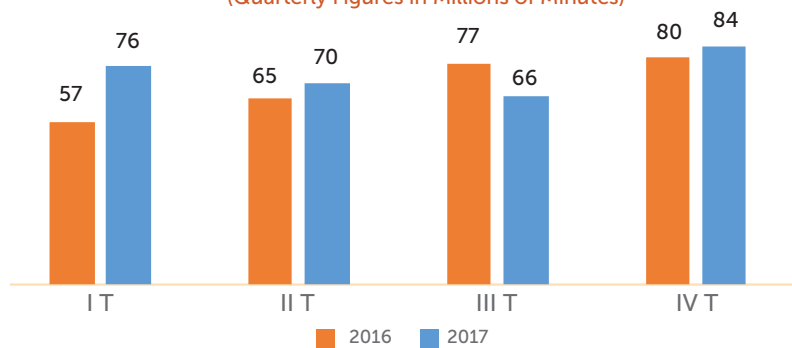
Source: SUTEL, General Directorate for Markets.

Graph N° 30
Costa Rica. Fixed Telephony Traffic, 2016-2017
(Quarterly Figures in Millions of Minutes)



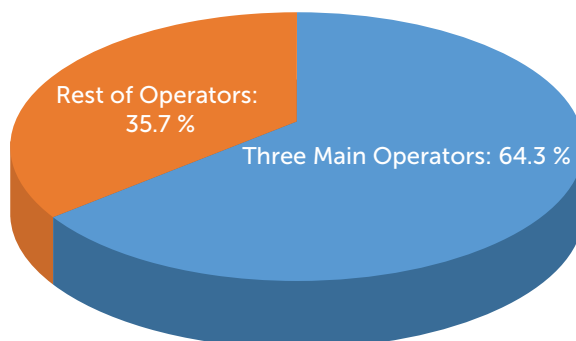
Source: SUTEL, General Directorate for Markets.

Graph N° 31
Costa Rica. VoIP Telephony Traffic, 2016-2017
(Quarterly Figures in Millions of Minutes)



Source: SUTEL, General Directorate for Markets.

Graph N° 32
Costa Rica. Percentage distribution of VoIP Telephony Traffic per provider

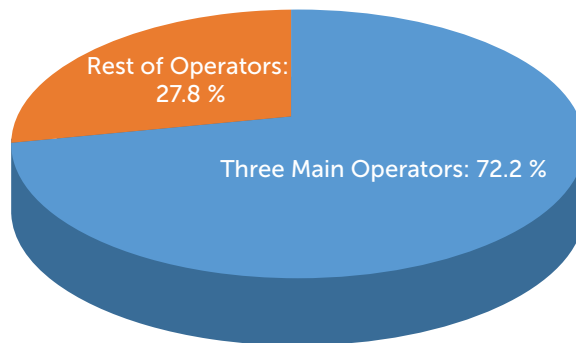


Source: SUTEL, General Directorate for Markets.

Graph N° 33
Costa Rica. Percentage distribution of VoIP Telephony Traffic per provider, 2017

In 2017, three main operators of VoIP account for

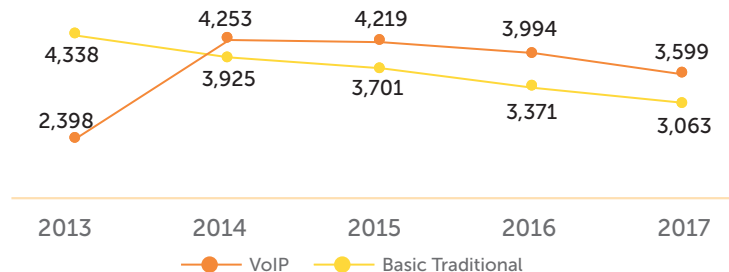
72.2 %
of the respective traffic.



Source: SUTEL, General Directorate for Markets.

Graph N° 34
Costa Rica. Average Traffic per Subscriber of Fixed Telephony, per Type of Connection, 2013-2017
(Figures in Minutes)

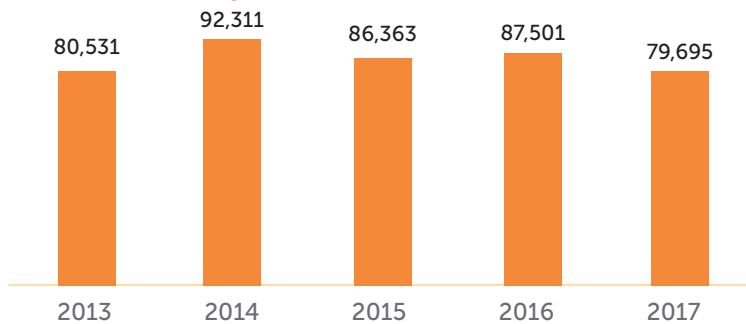
Average traffic per subscriber is **higher** in the case of VoIP service compared with the one in basic traditional telephony.



Source: SUTEL, General Directorate for Markets.



Graph N° 35
Costa Rica. Income for Fixed Telephony, 2013-2017
(Figures in millions of colones)



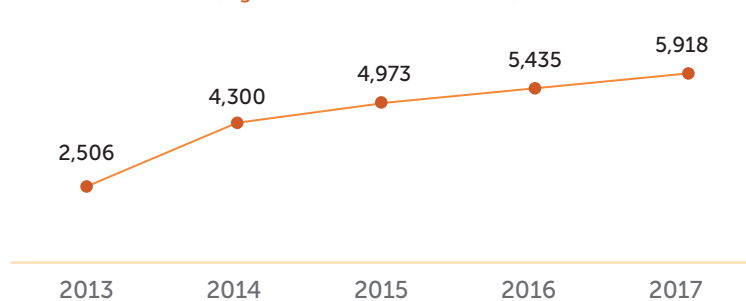
Decrease in the number of subscribers and fixed telephony traffic has reduced the corresponding income, that equal

1 %

between 2013 and 2017.

Source: SUTEL, General Directorate for Markets.

Graph N° 36
Costa Rica. Income for VoIP, 2013-2017
(Figures in millions of colones)

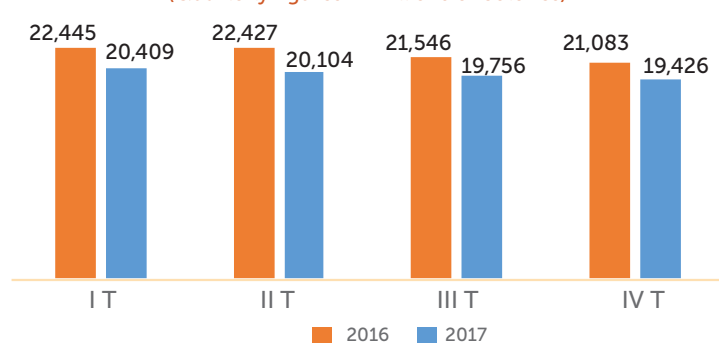


Since market opening, VoIP income have

increased
significantly.

Source: SUTEL, General Directorate for Markets.

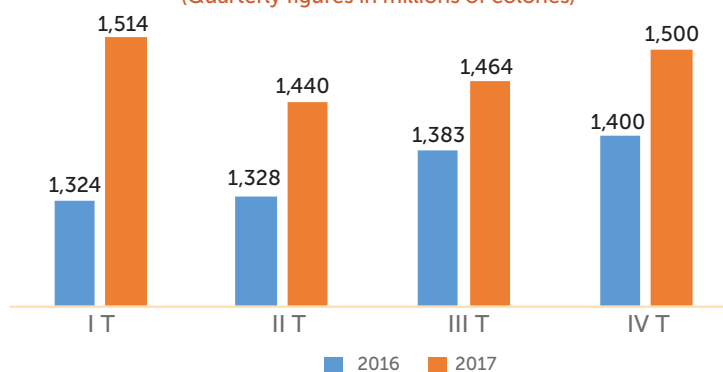
Graph N° 37
Costa Rica. Income for Fixed Telephony,
2016-2017
(Quarterly figures in millions of colones)



Source: SUTEL, General Directorate for Markets.



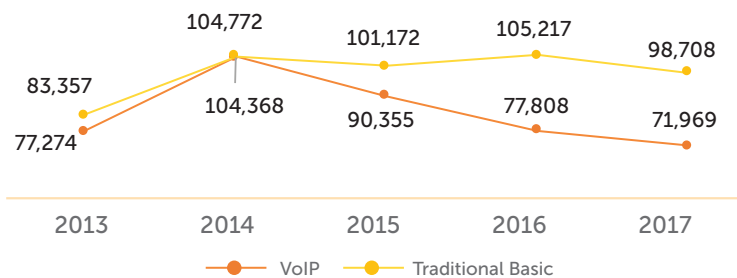
Graph N° 38
Costa Rica. Income for VoIP Telephony, 2016-2017
(Quarterly figures in millions of colones)



Source: SUTEL, General Directorate for Markets.

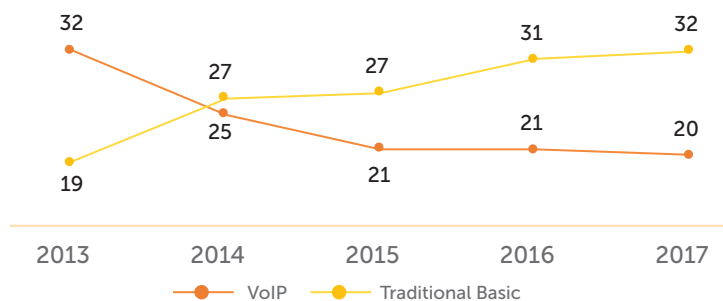
Graph N° 39
Costa Rica. Average Income per Subscriber of Fixed
Telephony, according to type of connection,
2013-2017
(Yearly figures in colones)

Average income per subscriber of the traditional basic telephony
surpasses
VoIP service income
during the analysis period,
2013-2017,



Source: SUTEL, General Directorate for Markets.

Graph N° 40
Costa Rica. Average Income per Subscriber of Fixed
Telephony, according to type of connection, 2013-2017
(Yearly figures in colones)



Source: SUTEL, General Directorate for Markets.



MOBILE TELEPHONY



MOBILE TELEPHONY

In 2017, mobile subscriptions reached a total of 8,840,342, a figure that represents a growth of 6 % compared to 2016. Of that total, 23 % correspond to postpaid lines and 77 % are prepaid.

Since the opening of telecommunications in Costa Rica, the mobile telephony market is undoubtedly one of the markets that has shown the greatest evolution in aspects such as subscriptions, penetration, revenues and traffic. Thus, since 2011, 4 new mobile telephony providers have joined: Claro, Telefónica, Tuyomóvil and Fullmóvil. These last two operate as virtual operators through the ICE networks. Altogether, they have achieved that subscriptions went from 3,128,372 (year 2010, with the existence of a monopoly) to 8,840,342 in December of 2017, which translates into an average annual increase of 16 %. This represents an increase in the penetration of voice services from 69 % to 179 % by 2017 (see [graphs N° 41 and N° 42](#)).

This evolution of the market has been characterized by offering more options and greater dynamism for the consumer, whether in the acquisition of devices, commercial offers (see details in commercial offers and prices section), payment methods (prepaid, postpaid, hybrid) and coverage, determining it as accessible, competitive and attractive market for Costa Ricans. Because of the above, in September 2017, SUTEL

declared the mobile telephony market as a competitive market¹.

Therefore, the second semester of 2017 certainly marks a before and after from the regulatory point of view. This is why SUTEL has taken a series of actions with the objective of following and closely monitoring the evolution of this market, whether these referring to the defense of user rights, promotion of competition, improvement of the quality of networks and services, price monitoring, dissemination of useful information to empower consumers, simplification of procedures and, finally, a qualitative change that, without a doubt, seeks to guarantee a market adaptable to the preferences, needs and behavior of the user, among other issues.

Now, in terms of commercial offers and prices, SUTEL has designed an index that monitors the trend of prices purchased by subscribers and, in addition, a web tool that compares in real time the different plans, promotions or discounts offered by the operators in the Costa Rican market. These results are summarized in the section on commercial offers and prices.

¹ Resolution RCS-248-2017, published on issue number 233 of La Gaceta of September 27, 2017.



In order that the reader get a broad picture of the evolution and situation of mobile telephony in Costa Rica, and in conjunction with what was indicated in the previous paragraph, the following topics are listed below: subscriptions, traffic, revenue and portability of this market.

Subscriptions

At the end of 2017, the mobile telephony market reached more than 8,840,000 lines, which represents 6 % growth compared to 2016 (see [graph N° 41](#)). The annual increase of 509,678 lines allows the penetration of mobile telephony to be 179 %, the highest recorded to date. The increase in subscriptions is strengthened with the variety of promotions and packages at lower and lower prices and with added services, attractive to all types of users (details can be found in the commercial offers and prices section).

The market share is distributed so that ICE is 51.8 %, followed by Movistar with 26.3 %, Claro with 21.3 %, and virtual operators 0.6 %, together.

Another element that emerges from statistical Annex N° 72 is that three of the operators close the year 2017 with an increase, compared to the year 2016, namely: ICE (3.1 %), Movistar (8.4 %) and Claro (14.9 %). On the other hand, mobile virtual operators decreased on average 47 %

From the point of view of the payment method, postpaid subscriptions have increased their participation at an average annual growth rate of 14 % since 2013; while prepaid subscriptions do so at a rate of 4 % (see graph N° 45). However, although it is true that the latter grows at a lower rate than postpaid, it continues to be the modality most contracted by users, since there are 3.3 active prepaid lines for each active postpaid line in the market.

When considering the internal structure of each modality (see [statistical Annex N° 75](#)), in the case of postpaid, the ICE presents a market share of 64.4 % (3.1 points less than the year 2016); followed by Claro, with 20.4 % (with 0.8 points less); and Telefónica, with 15.2 % (with 3.9 more points). In the case of prepayment, ICE continues to be

the operator with the largest participation represented with 48 % (1.2 points less than in 2016); followed by Telefónica, 29.6 % (0.3 points less); Claro, 21.6 % (2.3 points more); and mobile virtual operators that close together with a participation of 0.8 %.

Traffic

As of 2014, consumption in voice minutes (national and international, excluding roaming) started its downward trend with an average annual decrease of 9 % (-11 % year-on-year for 2017)². On the other hand, prepayment decreases at an average annual rate of 17 %, while postpaid increases to 3 % (see [graph N° 48](#)).

Another aspect that should be noted is that although there are more than 3 prepaid lines for each postpaid in 2017, the structure of voice consumption was practically

Mobile penetration reached 179 % in 2017. These results have been promoted by a greater dynamism in the offers and commercial promotions.

the same among the payment modalities (51 % postpaid, 49 % prepaid) (see [graph N° 48](#)). This, because for each prepaid minute consumed, approximately 3.5 minutes postpaid are consumed, and thus manages to locate this last modality as the one with the highest participation in traffic, even though their subscriptions are less than prepaid.

Following this line, according to the indicator of average consumption per user according to the payment method, as indicated in 2017 and throughout the previous years, the postpaid subscriber consumes more than the prepayment. However, the gap was accentuated, since in 2013, for each minute prepaid, 2.3 minutes postpaid were made, up to 3.5 minutes (2017), since on average

² From 2010 to 2014 (year in which traffic reached its highest level with 9037 million minutes), average increases of 62 % per year were recorded. In this same period of analysis, the prepaid modality presented the greatest changes in growth, while in the first part (2010 -2014) it increased to an average of 75 % per year, postpaid to 46 %.



a prepaid subscriber consumed 41 minutes per month, while postpaid was 143 minutes ([see graph N° 49](#)).

The behavior regarding the destination of calls remains similar since 2015, evidencing a stable consumption structure prioritized by on net calls (51.4 %), followed by off net calls (27.2 %), landline telephony destination (17.7 %) and, finally, international (3.7 %). It is necessary to indicate that the main year-to-year movement is between on-net and off-net destinations, yielding participation towards the latter ([see graph N° 50](#)), because of the growth of the participation of mobile network operators that are alternative to ICE.

Regarding international calls, its total traffic decreased by 4 % in relation to 2016. A similar situation occurs in the case of voice roaming, which, although it presented

which points, together with what is analyzed in the traffic section, to that in 2014 the mobile telephony market reaches its maturity they reach their maximum levels and, from there, the indicators tend to remain relatively stable or show small decreases.

2017 closed with 347,492 million colones, a similar item to that presented in 2016 (- 0,1 %) (See graph N° 56). This situation is exemplified by the ARPU mobile voice, since in 2016 it was 3372 colones, while in 2017 it closed with 3172 ([see graph N° 55](#)).

Regarding the distribution per component in mobile telephony, the structure remains the same practically since 2015, with 3 % of participation by messaging (SMS and MMS), and 97 % by national and international voice for the year 2017 ([see graph N° 57](#)).

Total revenue from mobile networks (including voice, SMS, MMS and mobile data, and excludes roaming), there is an upward trend since, by adding mobile data, total income increases since 2013 at an average annual rate of 9 %; however, for the year 2017 it grew by 2 %. Within the internal distribution by component, it is seen year after year that the mobile data take relative importance, going from representing 24 % for 2013, to 37 % at the end of 2017. This fact strengthens the signs of the rise of messaging and voice communications over the Internet through applications such as the OTT ([see graph N° 60](#)).

From the perspective of the form of payment in mobile networks, postpaid contributed 61 % of the revenues (the highest figure registered since 2010) against a 39 % prepayment. Note that this result is consistent with the increasing participation of voice-ticket traffic (51 %, 2017, based on a 3.5-minute postpaid consumption per 1 minute prepaid), even though the participation of its subscriptions is just 30 % of the total prepayment ([see graph N° 61](#)).

In relation to roaming revenues, the year 2017 closed with 10,066 million colones, of which 49 % comes from voice and the remaining 51 % from data and messaging. It is worth to point out that these components decreased by 4 % for voice, and a 15 % in messaging and data with respect to 2016 ([see graph N° 58](#) and [graph N° 59](#)).

Lastly, when translating the average revenue per user of the mobile network (data and voice) per user (ARPU,

3.5 minutes of post-paid are consumed for each minute consumed in the pre-paid modality.

a rise of 3 % in relation to 2016, this growth has tended to slow down since, since 2014, it had an average annual growth of 29 % ([see graph N° 51 and N° 52](#)).

Lastly, the SMS and MMS messaging are the components of mobile telephony that have received a significant decrease. The figures conclude that since 2013 the SMS decreases 37 % on average per year, while the MMS decreases (61 %), touching floor in 2017, with 3287 million SMS and 3 million MMS ([see graph N° 53 and N° 54](#)). This can be observed, even, comparing the average monthly consumption per subscriber, since, for the year 2013, it was 241 SMS; while in 2017, it was 31.

Income

It is relevant to note that the year 2014 marks a turning point because it presented the highest level of income recorded by mobile telephony (includes national, international voice, SMS, MMS, roaming and mobile data excluded) with 366,143 million colones. Since this year, income have remained relatively constant since they only show a 2 % decrease in annual average,



acronym in English), there is a decreasing trend since 2015, focused on the prepaid consumer: it went from 3,536 colones per month in 2015, to 2,653 for the year 2017 (-13 % in annual average); while in postpaid the reduction was 14,528 colones (2015) to 13 807 colones (2017), which reflects a decrease of 3 % per year ([see graph N° 62](#)).

Portability

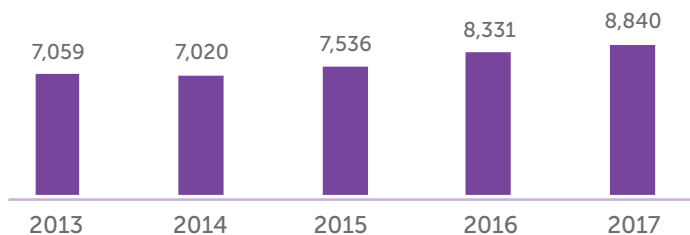
The possibility of changing the mobile telephony operator, keeping the telephone number, reached a figure of 374,940 successful porting processes in the year 2017, 14 % higher than the previous year ([see graph N° 63](#)).

To date, the data shows a greater use of this tool for the exercise of the right of the user to select the operator that satisfies his needs of quality, coverage, prices and commercial offers, characterized by a heterogeneous dynamism within the operators ([see graph N° 64](#)).



Graph N° 41
Costa Rica. Subscriptions to mobile telephony,
2013 -2017
(Yearly figures in thousands)

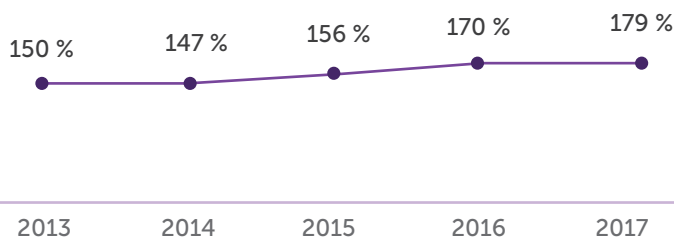
Subscriptions grew
6 %
with respect to 2016.



Source: SUTEL, General Directorate for Markets.

Graph N° 42
Costa Rica. Subscriptions to mobile Telephony
service, per each 100 inhabits, 2013-2017
(Yearly figures in percentages)

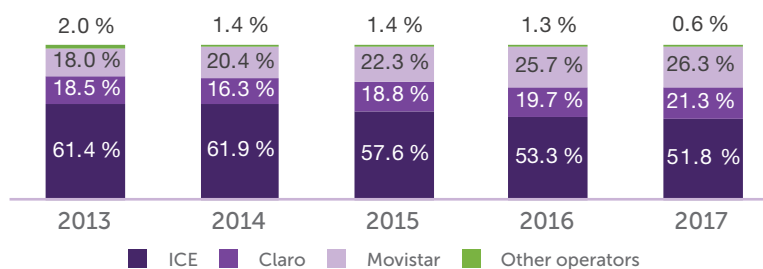
The penetration of mobile
telephony reached in 2017 is
the highest in its history
179 %.



Source: SUTEL, General Directorate for Markets.

Graph N° 43
Costa Rica. Subscriptions to mobile telephony
service, per operator, 2013 y 2017
(Yearly figures in percentages)

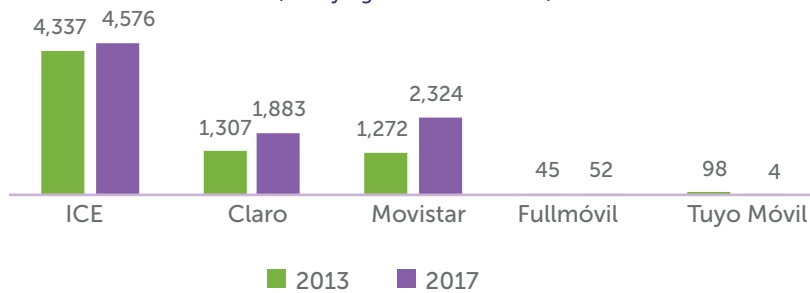
Virtual mobile operators
reduce their participation and
record the lowest figure since
2013.



Source: SUTEL, General Directorate for Markets.



Graph N° 44
Costa Rica. Subscriptions to mobile telephony
service, per operator, 2013 and 2017
(Yearly figures in thousands)

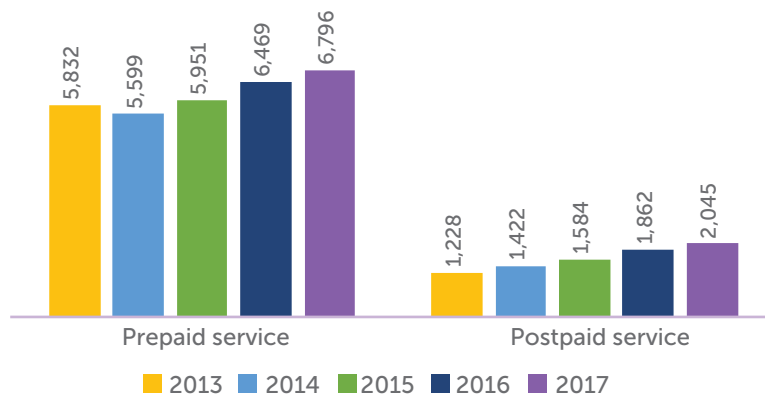


In the last 5 years, mobile
phone subscriptions increased

25 %

Source: SUTEL, General Directorate for Markets.

Graph N° 45
Costa Rica. Subscriptions to mobile telephony
service, per form of payment, 2013-2017
(Yearly figures in thousands)



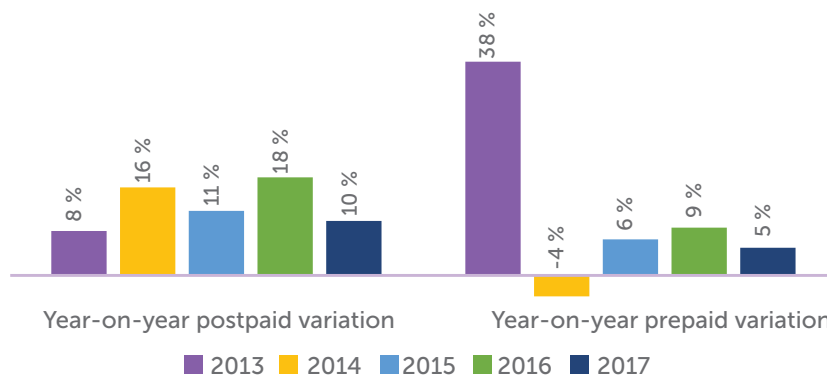
In 2017, there is
a total of

3.3

prepaid subscribers for
each postpaid
subscriber.

Source: SUTEL, General Directorate for Markets.

Graph N° 46
Costa Rica. Year of variation in subscriptions to mobile
telephony service, according to payment method, 2013-2017
(Yearly figures in percentage)



Both modalities they grew
in the last year, but at a
rhythm lower than
presented since

2015

Source: SUTEL, General Directorate for Markets.

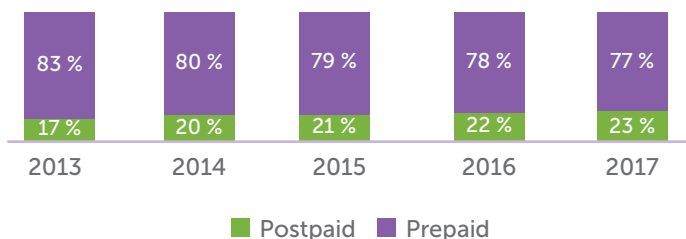


Since 2013, postpayment increases 1 % of participation in average, per year. It reaches

23 %

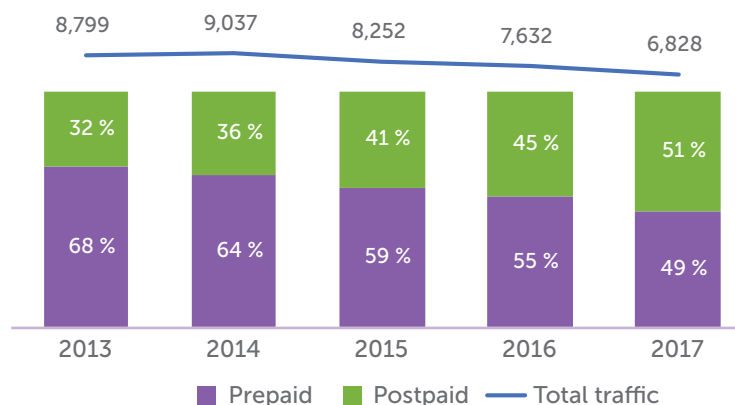
by the end of 2017.

Graph N° 47
Costa Rica. Distribution of subscriptions per form of payment, 2013-2017
(Yearly figures in percentage)



Source: SUTEL, General Directorate for Markets.

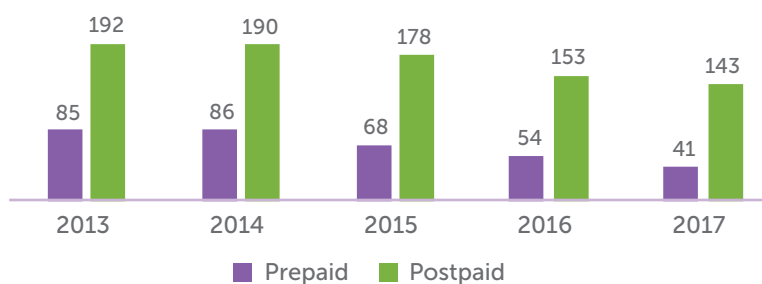
Graph N° 48
Costa Rica. Total traffic of mobile telephony¹ and its percentage distribution per form of payment, 2013-2017
(Figures in million of minutes and percentage)



¹ It only includes minutes for national and international voice; it excludes roaming.

Source: SUTEL, General Directorate for Markets.

Graph N° 49
Costa Rica. Average monthly voice traffic per subscriber per form of payment, 2013-2017
(Yearly figures in minutes per month and subscriber)



Source: SUTEL, General Directorate for Markets.

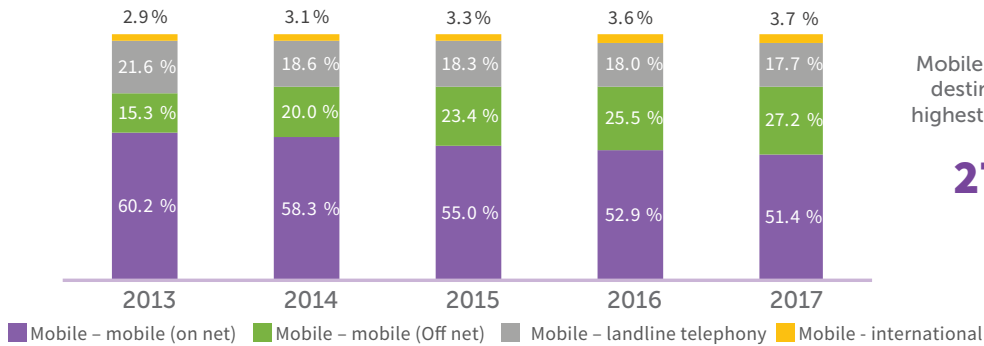
In 2017, a postpaid subscriber consumes an average of

3.5

times more than a prepaid subscriber per month.



Graph N° 50
Costa Rica. Distribution of total traffic associated with the mobile telephone service by destination¹, 2013-2017
(Yearly figures in percentages)



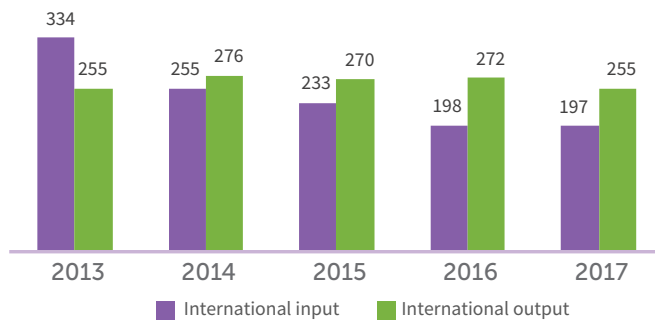
Mobile traffic with off net destination reaches its highest participation since 2013

27.20 %

¹ Only includes national and international voice minutes, excludes roaming

Source: SUTEL, General Directorate for Markets.

Graph N° 51
Costa Rica. International traffic linked to mobile telephony, 2013-2017
(Yearly figures in million of minutes)



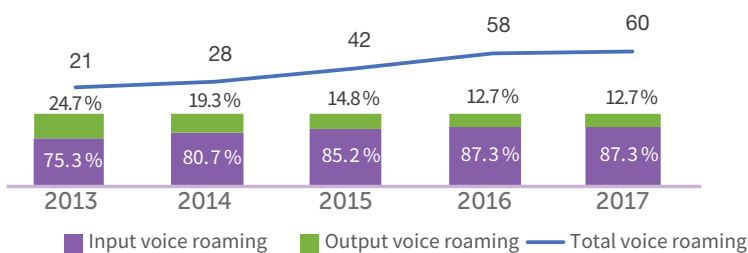
International output traffic reduced

6 %

with respect 2016, while input remained practically the same.

Source: SUTEL, General Directorate for Markets.

Graph N° 52
Costa Rica. Voice roaming traffic linked to mobile telephony, 2013-2017
(Yearly figures in millions of minutes and percentages)



Voice roaming traffic practically remained the same with respect to

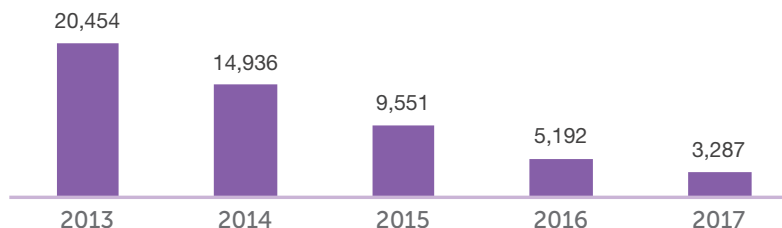
2016

Source: SUTEL, General Directorate for Markets.



Graph N° 53
Costa Rica. Total SMS traffic, 2013-2017
(Yearly figures in millions of messages)

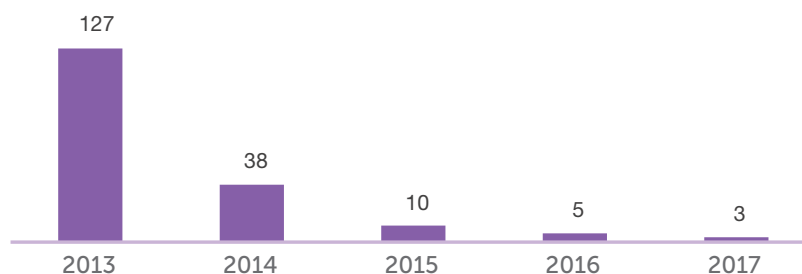
The SMS number of 2017
is only
16 %
of the amount registered
in 2013.



Source: SUTEL, General Directorate for Markets.

Graph N° 54
Costa Rica. Total MMS traffic , 2013-2017
(Yearly figures in millions of messages)

MMS Traffic decreases, on
average,
61 %
since 2013.

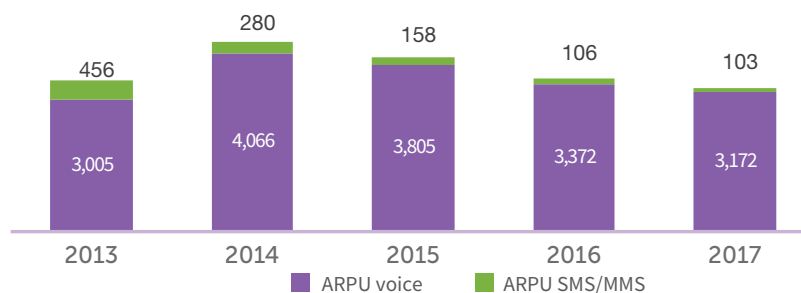


Source: SUTEL, General Directorate for Markets.

Graph N° 55
Costa Rica. Monthly average income, per subscriber
of mobile ¹telephony, per component, 2013-2017
(Figures in colones)

The average monthly income
per user according to the
mobile telephony component
reaches its lowest level since
2014, with

3,275 colones.

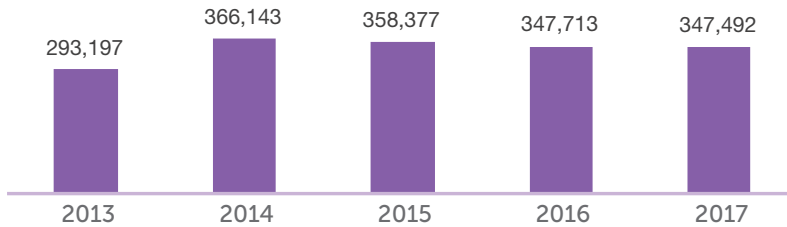


¹ Includes income per mobile and messaging, does not include roaming and mobile data

Source: SUTEL, General Directorate for Markets.



Graph N° 56
Costa Rica. Total income of mobile telephony
service ¹, 2013-2017
(Yearly figures in million of colones)



Income for mobile
telephony decrease

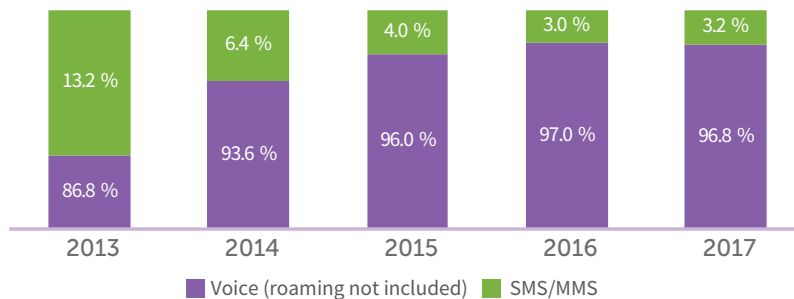
0.1 %

compared to 2016.

¹ Does not include mobile data or roaming

Source: SUTEL, General Directorate for Markets.

Graph N° 57
Costa Rica. Distribution of total income linked to
mobile telephony service per component,
2013-2017
(Yearly figures in percentages)



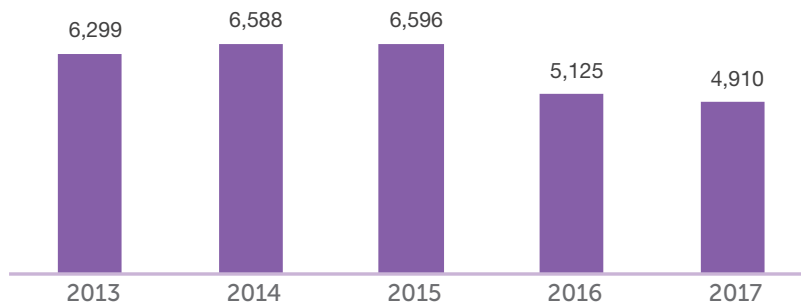
Income linked to mobile
telephony

**keeps the
distribution**

recorded for the last three
years.

Source: SUTEL, General Directorate for Markets.

Graph N° 58
Costa Rica. Total voice roaming income, 2013-2017
(Yearly figures in millions of colones)



Income from voice
roaming has decreased an
average of

14 %

yearly.

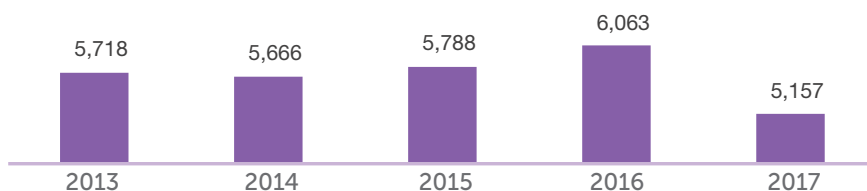
Source: SUTEL, General Directorate for Markets.



Graph N° 59
Costa Rica. Total income for SMS/MMS and data roaming
2013-2017

(Yearly figures in millions of colones)

Income form SMS / MMS
and data roaming
decreased
15 %
with regards to 2016.

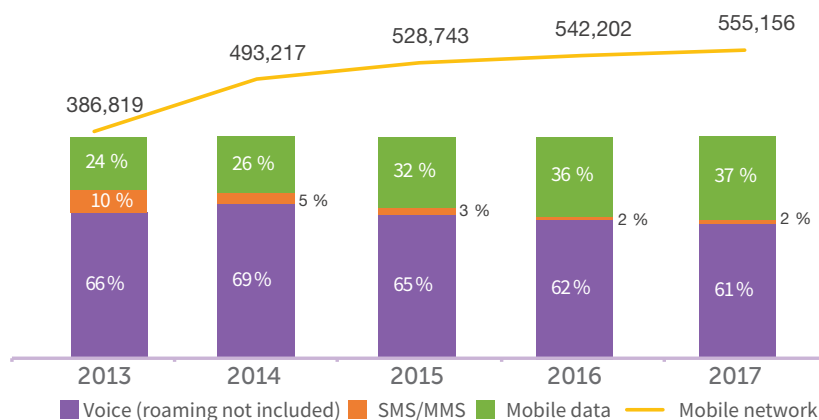


Source: SUTEL, General Directorate for Markets.

Graph N° 60
Costa Rica. Total income linked to mobile network¹
and distribution per component, 2013-2017

(Yearly figures in percentages and in millions of colones)

Total income of mobile
network increased
2 %
with regards 2016.



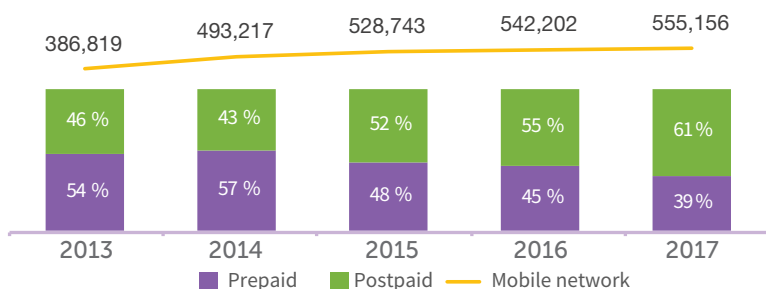
¹ Includes income from mobile voice, messaging and mobile data. Roaming not included.

Source: SUTEL, General Directorate for Markets.

Graph N° 61
Costa Rica. Distribution of total Income linked to
network¹, per form of payment, 2013-2017

(Yearly figures in percentage and in millions of colones)

Postpaid reaches its
highest participation on
the mobile network
income in the last five
years
(61 %).

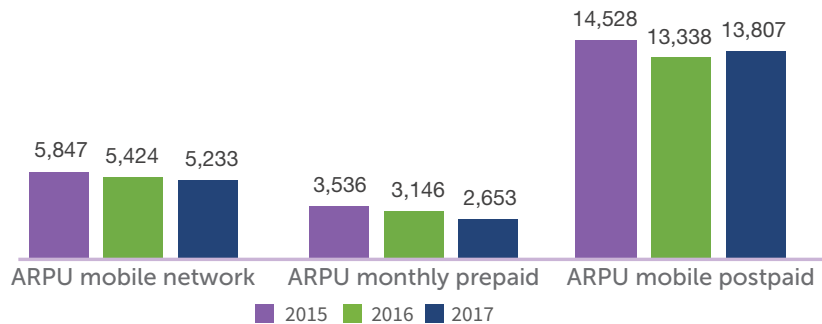


¹ Includes income per mobile voice, messaging and mobile data. Roaming not included.

Source: SUTEL, General Directorate for Markets.



Graph N° 62
Costa Rica. Monthly average income per mobile network subscriber¹, per form of payment, 2015-2017
(Figures in colones)



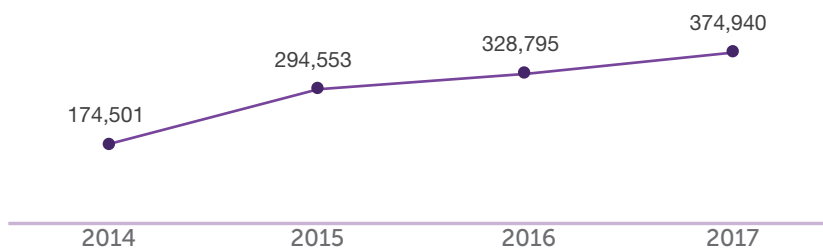
Income of mobile network per subscriber has decreased an average of

5 %
yearly, sin 2015.

¹ The average income per subscriber (ARPU), includes outgoing and incoming mobile voice income at national and international level, national and international SMS / MMS and mobile data, excludes roaming income (voice, SMS / MMS and data)

Source: SUTEL, General Directorate for Markets.

Graph N° 63
Costa Rica. Yearly successful porting processes¹ 2014 - 2017
(Yearly figures)



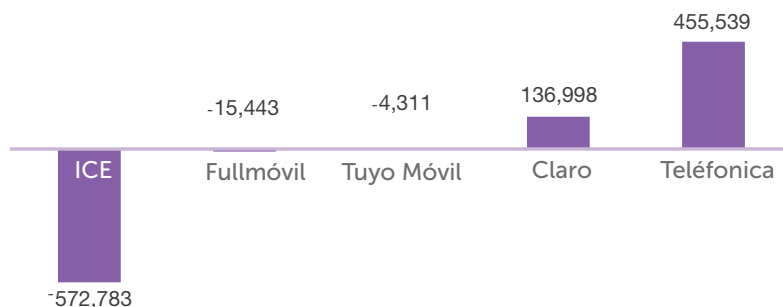
The number of successful porting process grew

14 %
in the last year.

¹ Successful porting processes number of porting processes that were finally on network of new operator.

Source: SUTEL, General Directorate for Markets and General Directorate for Quality.

Graph N° 64
Costa Rica. Porting processes per operator, December 2013 – December 2017
(Accumulated figures)

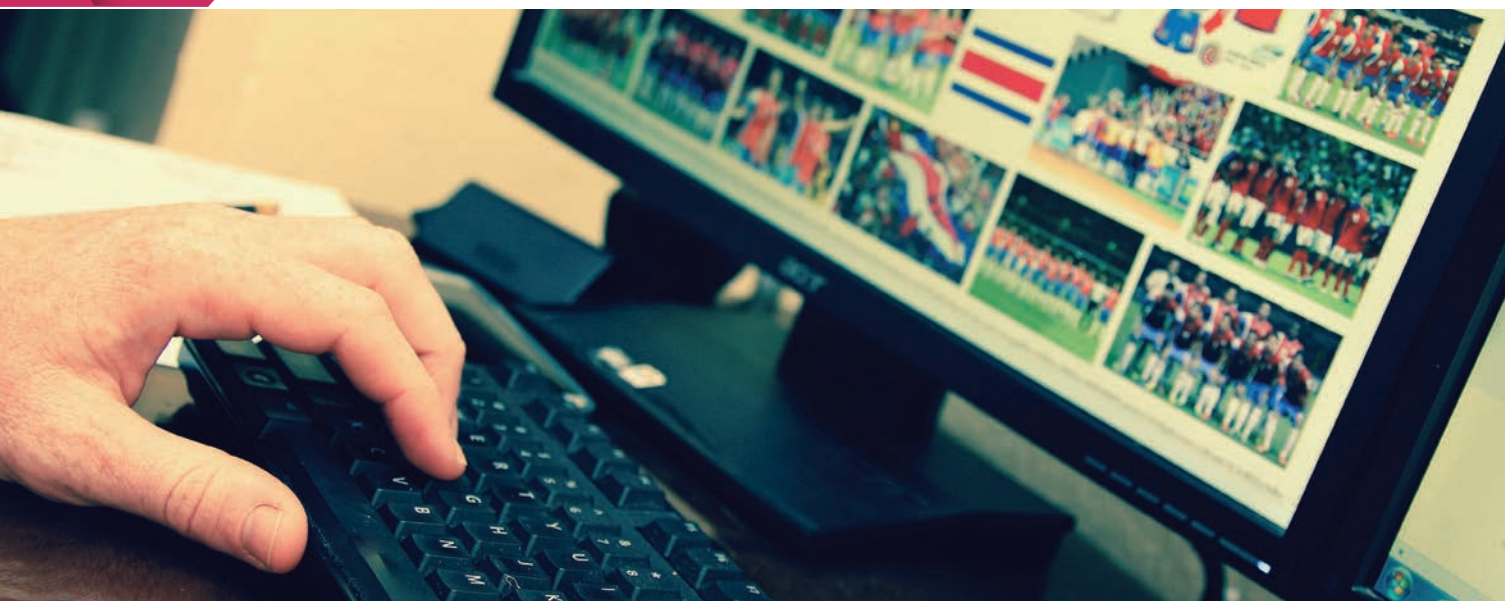


Source: SUTEL, General Directorate for Markets and General Directorate for Quality.



DATA TRANSFER





DATA TRANSFER

In the last year, this service shows a growth, both in the income generated by the Internet access service and in the corresponding to dedicated lines service (31 % for dedicated lines, Internet access in fixed networks with 15.1 % and networks mobile phones 6.8 %).

Mobile Internet Access

The revision of this service includes all users who access the Internet from their cell phone or from some type of USB device. No differentiation is made by second, third or fourth generation technologies, but it is analyzed separately according to the payment method.

Subscriptions

Graph N° 65 shows how the number of users has increased from 2013 to 2017¹. It can be seen that increase was 10.4 % from 2016 to 2017, an increase of 452,880 subscribers at the end of 2017.

Graph N° 66 presents the evolution by quarter for the period 2016-2017. As it can be seen, the growth is sustained for the period, and a compound growth rate of 2 % is calculated.

Subsequently, on [graph N° 67](#), the description of the subscriptions was reviewed according to the access device used. The number of subscribers who have a cell

phone is 97.5 % at the end of the last quarter of 2017. It should be noted that the remaining 2.5 % corresponds to users who used USB devices.

[Graph N° 68](#), which considers users per cellular device, shows that at the end of 2017, the percentage of postpaid customers was 34.7 %, while in prepaid it was 65.3 %, and it maintains the trend of distribution of platforms from previous years.

[Graph N° 69](#) shows the number of subscriptions for the 2013-2017 period, in which both prepaid and postpaid customers have been increasing. For example, composite prepaid growth for the entire period is 2.9 %, and for postpaid, 9.8%. In absolute terms, from 2016 to 2017, the prepaid service increased by 249,269 users, and the postpaid increased by 183,539 users. As a complement, [graph N° 70](#) shows the distribution between prepaid and postpaid users by quarter for the 2016-2017 period. It is observed how the relative difference between both types of payment is broad, and that at the end of 2017 the difference between postpaid and prepaid was 30.6 %, less than 32.3 % at the end of 2016.

¹ For 2014-2017 SUTEL incorporated a modification of the total number of users of prepaid mobile Internet notified by Claro CR Telecomunicaciones, which reduces the total number of reports of that company for the prepaid modality.



Traffic

Lastly, a brief analysis about data traffic in the mobile network is presented. [Graph N° 71](#) shows how the consumption of data went from 122,189 TB in 2016 to 135,003 TB in 2017, which represents a variation of 10 % between those years. This value is 63 % between 2016 and 2015, and 97 % between 2015 and 2014.

To expand this detail, [Table N° 72](#) shows the quarterly figures for the period 2016-2017. It can be seen how, as of the first quarter of 2017, the consumption of data in the mobile network decreased, and closes the fourth quarter with 5,574 TB less than the first quarter of 2017.

Income

When analyzing the registered revenues for mobile Internet in the 2013-2017 period, it can be observed how it has increased from year to year; for example, from 2016 to 2017 the increase was 7 %, and reached a total of 13,162 million Colones more, as shown on [graph N° 73](#). Next, [graph N° 74](#) shows the quarterly variation in which it is highlighted that, the maximum value, during the second quarter of 2017 (52,779 million Colones) is followed by a decrease in both, third and fourth quarter, and revenues at the end of the year are 51,579 million Colones. Despite this, the compound growth of the period is 1.7 %.

The composition of the income according to the access device used is shown on [graph N° 75](#), where it can be seen that income of subscribers using a cell phone represents 95.9 % of the income reported at the end of the year. Based on the foregoing, the following paragraphs will focus on the analysis of the behavior of the income variable for customers who use cell phones, based on the comparison between payment methods.

[Graph N° 76](#) shows how, at the end of 2017, the percentage of revenues generated under the postpaid modality represented 47.4 % of the total generated that year; while in prepaid it was 52.6 %. [Graph N° 77](#) shows the value of revenues for the period 2013-2017, where both prepaid and postpaid revenues have been increasing. For example, in prepaid the compound growth for the whole period is 18.9 % per year and for postpaid of 23.9 %. In absolute terms, from 2013 to 2017, prepaid service increased by 49,991 million Colones, and postpaid increased by 57,061 million Colones. As a complement, [graph N° 78](#) presents the distribution between prepaid and postpaid income by

quarter for the 2016-2017 period; it is observed how at the end of 2017 the postpaid income represented 51 % of the total, value greater than 48 % registered at the end of 2016.

Internet Access over Fixed Networks

Subscriptions

Subscriptions registered for the fixed Internet service can be seen on [graph N° 79](#), which shows a growth between 2016 and 2017 of 17 %, closing 2017 with

Connections to fixed Internet over fiber exceed wireless connections for the first time in 2017.

744,041 subscriptions. That is, a total of 259,158 more subscriptions than at the end of 2013, which shows the growth of this service. To expand this, [graph N° 80](#) shows the evolution by quarter for the 2016-2017 period, where there is a sustained growth since the first quarter of 2016, which represents a 4 % compound growth.

When analyzing the behavior of total subscriptions in 2017 by connection technology and by speed range, [graph N° 81](#) shows how HFC networks have the highest participation in the four quarters, and close the year with 59.9 %; that is, 23.5 % more than the participation of the xDSL networks. It is also observed that fiber connections exceed the number of wireless connections for the first time since 2015.

Similarly, [graph N° 82](#) shows the percentages of participation by speed ranges. In the first instance, it could be seen that in 2017 the speeds contracted between 2 Mbps and 10 Mbps cover more than 60 % of the total in the four quarters, and close the year with 63.7 % of the total. It could also be seen how connections with speeds lower than 2 Mbps are decreasing throughout the year, so that for the fourth quarter the percentage of clients with contracted speeds lower than 512 kbps close by 0.8 %; and with speeds between 512 kbps and 2 Mbps, they close at 26.7 %.



Traffic

The information regarding the traffic of data transferred by Internet services in fixed networks shows how the consumption of the users has been increasing. [Graph N° 83](#) clearly shows this growth: in 2017 a total of 620,082 TB was recorded, a 348 % growth with respect to 2014 and a variation of 60 % with respect to 2016.

This can be seen in more detail on [graph N° 84](#), which shows the amount of data transferred per quarter for the period from 2016 to 2017, showing a compound growth of 11 %.

Lastly, [graph N° 85](#) allows to see the percentage distribution of traffic according to the access technology.

The income according to the access technology, HFC, xDSL, FTTx and wireless access technologies as a single group (satellite, WiMax and microwave) are shown on [graph N° 88](#). This last group, at the end of 2017, contributed 3.1 % of total revenues; fiber connections, on the other hand, did so by 13.4 %, services on copper networks by 40.9 %; and coaxial cable networks, 42.7 %. This is the first quarter where they cover a greater proportion of income.

Regarding the percentage distribution of revenues according to the speed ranges contracted, they are divided into six ranges². It can be seen on [graph N° 89](#) that, at the end of 2017, the speeds contracted between 2 Mbps and 10 Mbps cover a 47.1 % of total revenues, followed by speeds between 10 Mbps and 100 Mbps, with 16.9 % of the total, which shows a greater adoption of speeds over 2 Mbps.

The amount of data transferred via fixed networks increased 60 % in the last year.

In this case, it is the HFC networks that cover a quarterly average of 65.9 % in 2017. Next, clients on xDSL, which account for an average of the four quarters of 17.1 %. It should be noted that the FTTx networks increased their participation in 2017, reaching an average of 14.9 %.

Income

Regarding the income received for fixed Internet services, [graph N° 86](#) shows the behavior for the period 2013-2017, where the annual variation between 2016 and 2017 is 15 %, equivalent to 16,765 million Colones more in the 2017. It should be noted that the growth has been constant year after year for the period indicated and that in 2017 the fixed Internet service accumulated 59,563 million Colones more than what was recorded in 2013; that is a 4 % compound annual growth.

[Graph N° 87](#) shows the quarterly variation for the 2016-2017 period, which shows that after a decrease between the fourth quarter of 2016 and the first quarter of 2017, revenues increased by 2761 million in the second quarter of 2017. A compound growth for all quarters of the year of 4 %.

Wholesale Access to Fixed Internet

The information provided in this section corresponds to the network operators who, to date, provide Internet services for other providers, giving access to the Internet through transport networks, international links or wet capacity. You get the amount of services and their corresponding income.

Subscriptions

[Graph N° 90](#) shows the number of wholesale subscriptions to fixed Internet for the period of 2015-2017. This denotes an inter-annual increase of 17 %, and the annual closure with 333 contracted services. This Table is complemented by [graph N° 91](#), which shows the number of subscriptions per quarter. As it can be observed, there was a decrease of 86 subscriptions towards the second quarter, with respect to the closing of the first quarter. However, in the third quarter the behavior changed and 374 connections were reached, to finish the year with 333 reported connections.

The information of this service was also collected by connection technology and by speed. [Graph N° 92](#) presents the percentage distribution of subscribers by technology during 2017, where fiber connections covered 78.1 % at the end of the year, followed by

² Connections with speeds lower than 512 kbps, clients with contracted speeds between 512 kbps and 2 Mbps, a range between 2 Mbps and 10 Mbps, clients with contracts between 10 Mbps and 100 Mbps, connections greater than 100 Mbps and a group called unspecified speed.



companies that, through their microwave backhaul, provide wholesale services, covering 15 % of the total at the end of the year.

Finally, the speed ranges of the contracted services are consulted and the [graph N° 93](#) shows the quarterly variation, where speeds less than 10 Mbps cover the largest number of connections every quarter, closing the year at 54.4 %.

Income

[Graph N° 94](#) shows a significant increase in the total reported income for the wholesale Internet service, which shows an 89 % increase between 2016 and 2017.

In a complementary manner, the variation of income by quarter for the indicated period is presented on [graph N° 95](#). It can be seen in greater detail the increase in 2017, closing the fourth quarter with a total of 1,264 million Colones, a 99 % increase compared to the same period in 2016.

For this variable, the information was also collected by connection technologies and by speed range. In the first instance, [graph N° 96](#) presents the percentage distribution of technology revenues, where it is highlighted that the revenues generated by fiber optic connections are at the upper end, closing the fourth quarter with 69.9 % of the total; on the other hand, the lower end is occupied by wireless connections with 2.3 %.

Lastly, we have on [graph N° 97](#) the information by speed ranges. This Table shows that customers with speeds greater than 1 Gbps contribute, at the end of 2017, 72.9 % of total revenues of companies in the segment wholesaler.

Dedicated lines

Connections

Regarding the evolution of the number of connections per year for the period 2013-2017, [graph N° 98](#) shows that 2017 closed with 18,124 connections, 2,092 connections more than in 2016.

[Graph N° 99](#) shows the behavior of the number of connections per quarter for the 2016-2017 period. An increase is observed for 2017, and comparing the end of each year the increase in 2017 was 13 %. On average, in 2016, 15,806 connections stayed per quarter, while in 2017 the average per quarter was 17,955, showing, this service, a greater dynamism for that last year.

When considering the geographic location of the client³, [graph N° 100](#) shows how 1 % of the total connections are outside of Costa Rica. Next, the analysis of dedicated lines for national connections is presented, which correspond to the remaining 99 %.

[Graph N° 101](#) shows the number of national connections for each quarter of 2017, staying above 17,000 connections throughout the year. Of that total it should be noted that one part is sold in the wholesale market and the rest in the retail market. [Graph N° 102](#) shows this distribution by quarter, in which there is a gradual increase in the wholesale market, starting the first quarter with 8.3 % and a close of 14.2 % in the fourth quarter.

Now, considering that the retail segment corresponds to more than 85 % of the national clients, when focusing the analysis on percentage distribution by connection technology and by contracted speed, [Graph N° 103](#) shows that IP connections have a 62 % participation on average for the four quarters of the last year, given its scalability and cost; digital links (MPLS) continue with an average participation for the four quarters of 19.3 %.

Finally, [graph N° 104](#) shows the percentage distribution by contracted speeds, where two ranges predominate: that of speeds higher than 100 Mbps, with an average for the four quarters of 32.3 %; and speeds, between 2 Mbps and 10 Mbps, also with an average for the four quarters, also, of 32.3 %.

Income

[Graph N° 105](#) shows how, at the end of 2017, 44.974 million colones were recorded, 10.541 million more than in 2016 in the income reported by these services.

[Graph N° 106](#) shows the behavior of revenues per quarter, where there is a general increase for 2017. Comparing

³ There are services that are offered to clients abroad.



the closing of each year, the increase in 2017 was 31 %. On average, in 2016 an average income of 8,608 million was maintained per quarter; while in 2017 the average per quarter was 11,243.

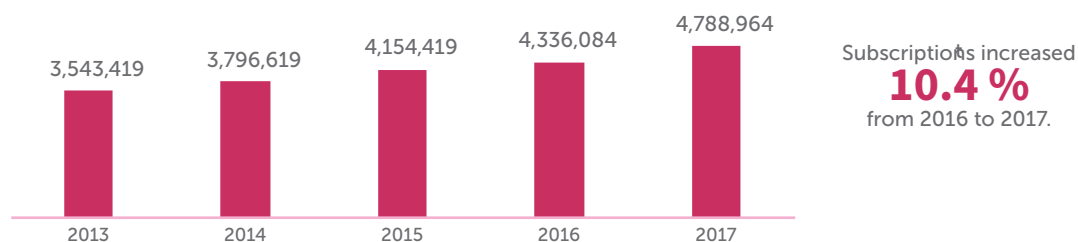
On the other hand, customers located abroad show that 8.8 % of total income is obtained from them ([Graph N° 107](#)). As the income of the service of dedicated lines is 91.2 % obtained by customers within the national territory, the study will be focused on this segment.

[Graph N° 108](#) shows the total revenue for each quarter of 2017 according to the detail explained above, thus maintaining an average of 10,419 million throughout the year. Then, of that total obtained within Costa Rica, it should be noted that one part comes from the wholesale market and the rest comes from the retail market. [Graph N° 109](#) shows this distribution by quarter, where there is a gradual increase in revenues in the wholesale market, starting the first quarter with 10.7 % and closing the fourth quarter in 18.6 % of the total.

However, considering that the retail segment corresponds to more than 81 % of national revenues, the percentage distribution by connection technology and by contracted speed is revised for these revenues. For this, [graph N° 110](#) shows the percentage participation for the connection technologies consulted by the SUTEL and it is observed that the IP connections have the highest participation, with 58 % on average for the four quarters, followed by the digital links, with an average participation for the four quarters of 33.3 %. Finally, [graph N° 111](#) shows the percentage distribution by contracted speeds, where the range of speeds between 2 Mbps and 10 Mbps averages 28.8 % of the revenues in the national retail market for the four quarters.

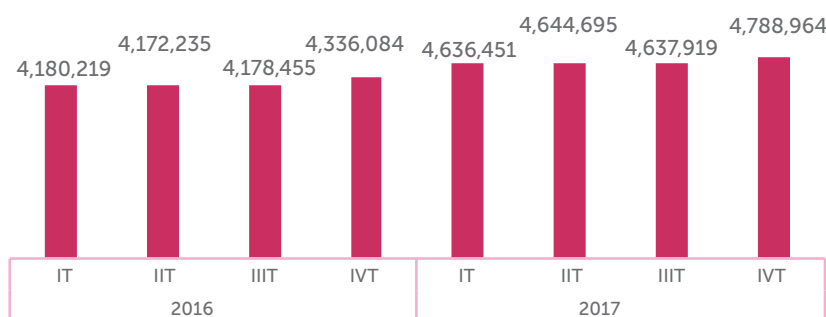


Graph N° 65
Costa Rica. Subscriptions, Internet access in the mobile network, 2013 – 2017
(Annual numbers)



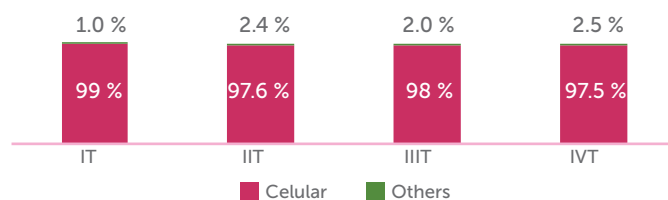
Source: SUTEL, General Directorate for Markets.

Graph N° 66
Costa Rica. Subscriptions, Internet access in the mobile network, 2016 – 2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

Graph N° 67
Costa Rica. Subscriptions, Internet access in the mobile network.
Percentage distribution according to access device, 2017
(Quarterly numbers)

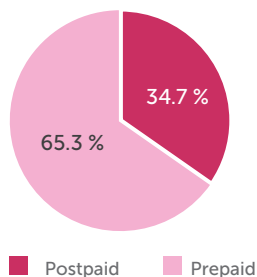


Source: SUTEL, General Directorate for Markets.



Graph N° 68

Costa Rica. Subscriptions, mobile Internet access, percentage distribution by payment method, 2017
(Numbers at the end of the year)

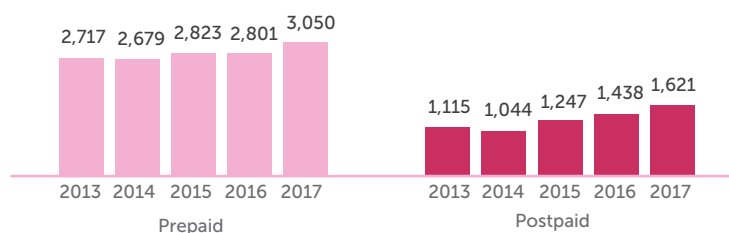


Source: SUTEL, General Directorate for Markets.

Graph N° 69

Costa Rica. Subscriptions, mobile Internet access, comparison by payment method, 2013 – 2017
(Annual numbers in thousands of subscriptions)

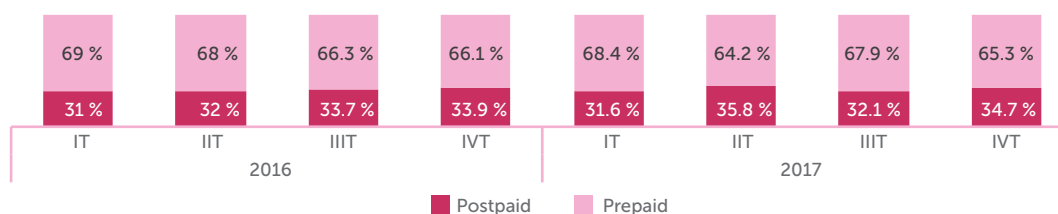
From 2016 to 2017 there was an **increment** in pre-paid and post-paid subscriptions.



Source: SUTEL, General Directorate for Markets.

Graph N° 70

Costa Rica. Subscriptions, Internet access in the mobile network, percentage distribution by payment method, 2016 – 2017
(Quarterly numbers)



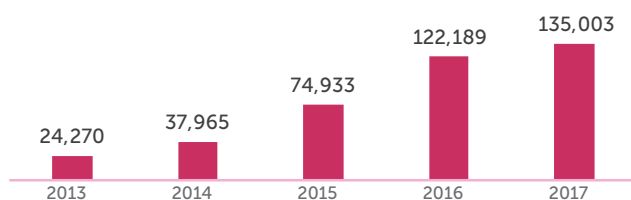
Source: SUTEL, General Directorate for Markets.



Graph N° 71

Costa Rica. Data traffic, Internet access in the mobile network, 2013 – 2017

(Annual numbers in TB)



From 2016 to 2017,
data traffic went up to

10.4 %.

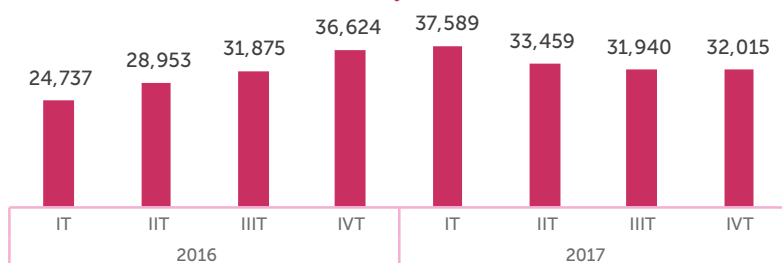
Source: SUTEL, General Directorate for Markets.

Graph N° 72

Costa Rica. Data traffic, Internet access in the mobile network

2016 – 2017

(Quarterly numbers in TB)

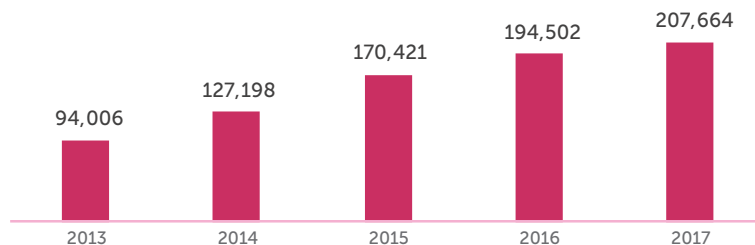


Source: SUTEL, General Directorate for Markets.

Graph N° 73

Costa Rica. Income, Internet access in the mobile network, 2013 – 2017

(Annual numbers in millions of colones)



From 2016 to 2017, there was an

increment

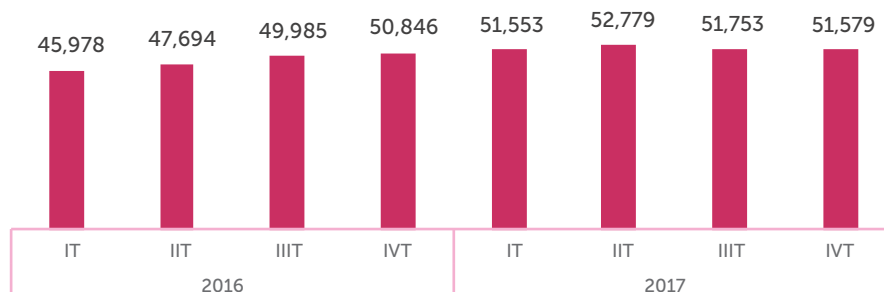
in revenues in pre-paid and
post-paid.

Source: SUTEL, General Directorate for Markets.



Graph N° 74

Costa Rica. Income, Internet access in the mobile network, 2016 – 2017
(Quarterly numbers in millions of colones)

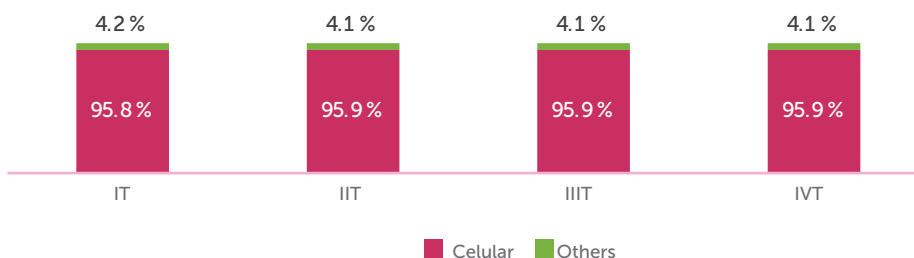


Source: SUTEL, General Directorate for Markets.

Graph N° 75

Costa Rica. Income, Internet access in the mobile network.
Percentage distribution according to access device, 2017
(Quarterly numbers)

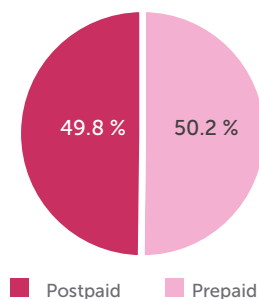
Los ingresos
aumentaron un
6.7 %
del 2016 al 2017.



Source: SUTEL, General Directorate for Markets.

Graph N° 76

Costa Rica. Income, mobile Internet access, distribution by payment method,
2017
(Numbers at the end of the year)



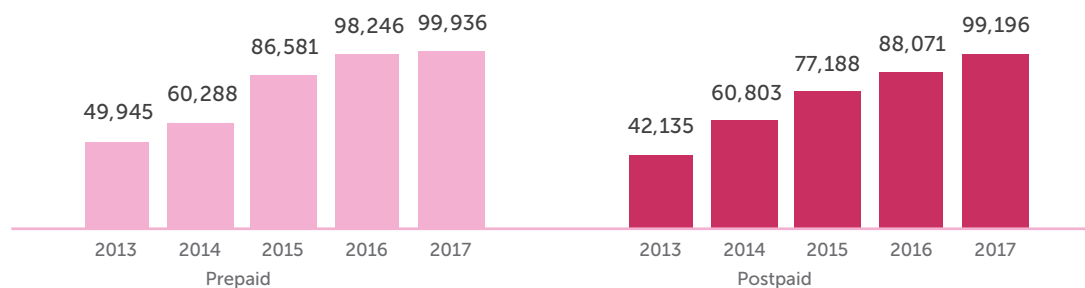
Source: SUTEL, General Directorate for Markets.



Graph N° 77

Costa Rica. Income, mobile Internet access, comparison by payment method, 2013 – 2017

(Annual numbers in millions of colones)

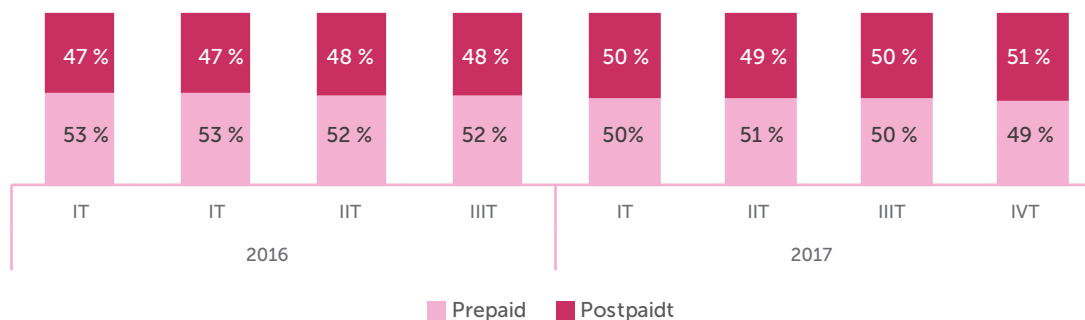


Source: SUTEL, General Directorate for Markets.

Graph N° 78

Costa Rica. Income, Internet access in the mobile network, distribution by payment method, 2016 – 2017

(Quarterly numbers)

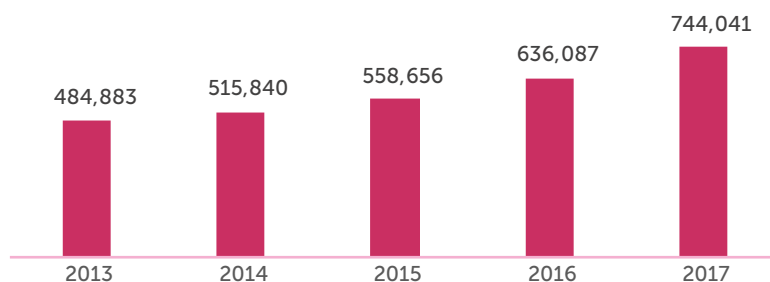


Source: SUTEL, General Directorate for Markets.

Graph N° 79

Costa Rica. Subscriptions, fixed Internet access, per year, 2013 – 2017

(Annual numbers)



From 2016 to 2017,
subscriptions increased

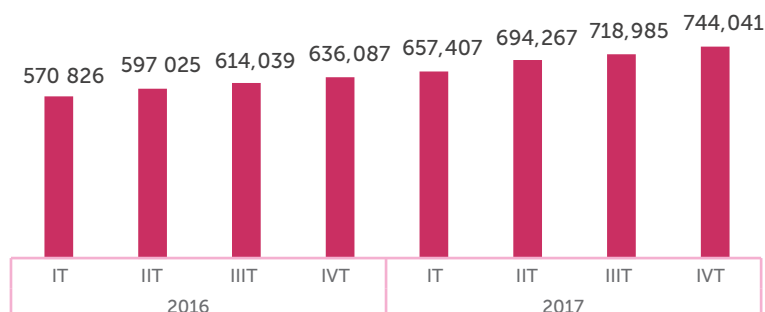
16.9 %.

Source: SUTEL, General Directorate for Markets.



Graph N° 80

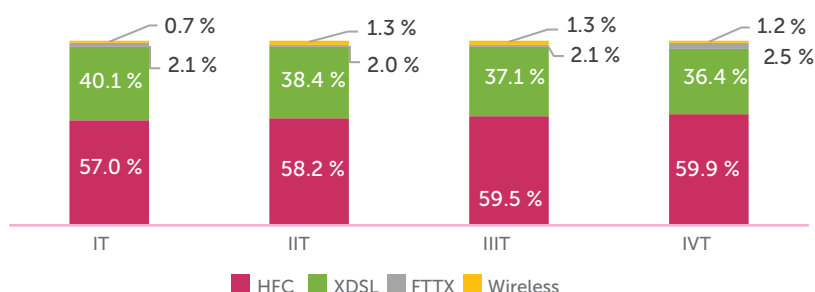
Costa Rica. Subscriptions, fixed Internet access, per quarter, 2016 -2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

Graph N° 81

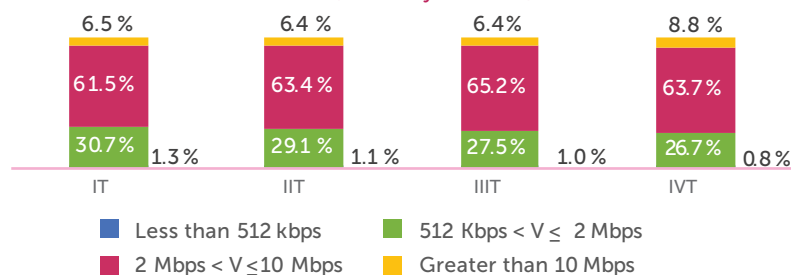
Costa Rica. Subscriptions, fixed Internet access, percentage distribution by technology, 2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

Graph N° 82

Costa Rica. Subscriptions, fixed Internet access, percentage distribution by speed range, 2017
(Quarterly numbers)

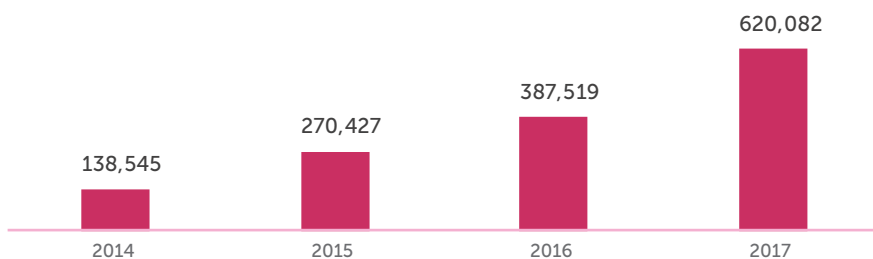


At the end of 2017,
63.7 %
of subscriptions had
contracted speeds between
2 Mbps and 10 Mbps.

Source: SUTEL, General Directorate for Markets.



Graph N° 83
Costa Rica. Data traffic, fixed Internet access, per year, 2014 -2016
(Annual numbers in TB)

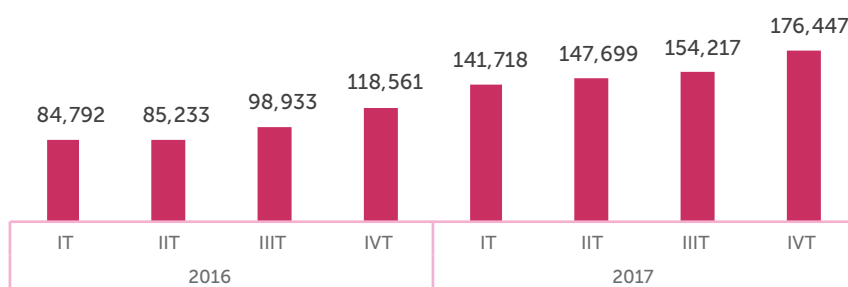


From 2016 to 2017,
data traffic increased

60 %.

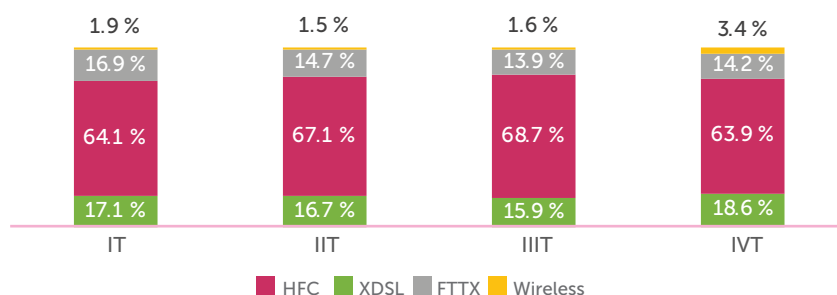
Source: SUTEL, General Directorate for Markets.

Graph N° 84
Costa Rica. Data traffic, fixed Internet access, per year, 2016-2017
(Annual numbers in TB)



Source: SUTEL, General Directorate for Markets.

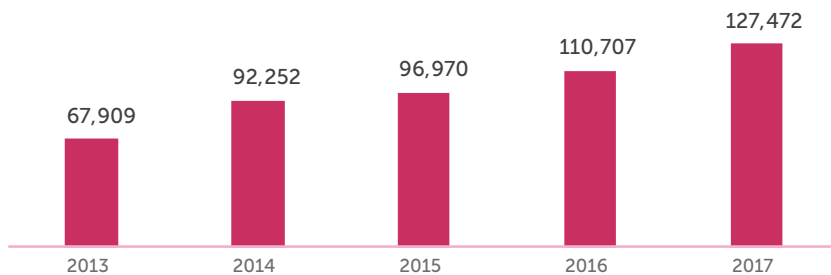
Graph N° 85
Costa Rica. Data traffic, fixed Internet access, technology distribution, 2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

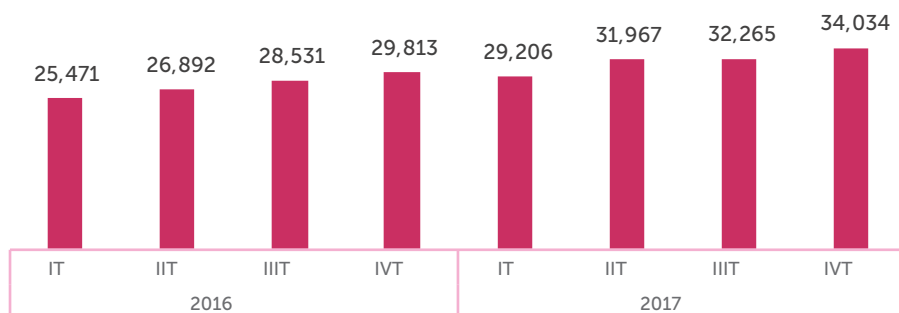


Graph N° 86
Costa Rica. Income, fixed Internet access, per year, 2013 – 2017
(Annual numbers in million of colones)



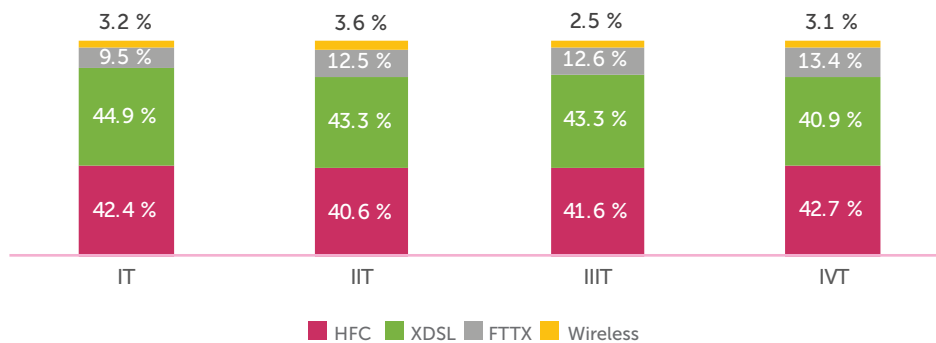
Source: SUTEL, General Directorate for Markets.

Graph N° 87
Costa Rica. Income, access to fixed Internet, 2016 – 2017
(Quarterly numbers in millions of colones)



Source: SUTEL, General Directorate for Markets.

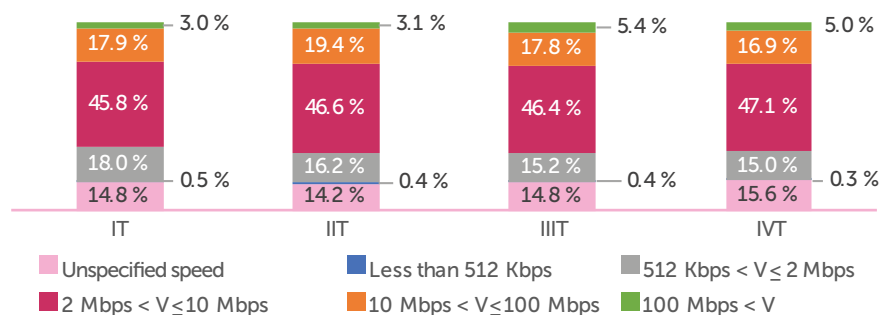
Graph N° 88
Costa Rica. Income, fixed Internet access, percentage distribution by technology, 2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

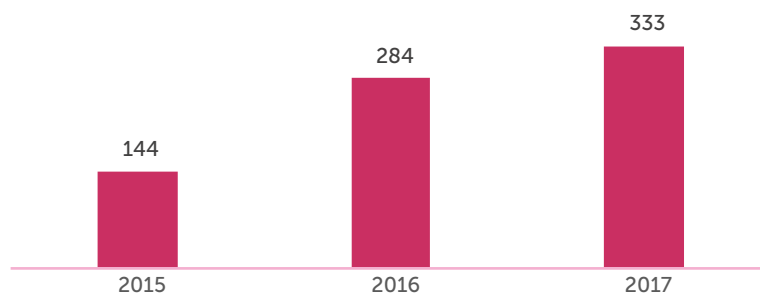


Graph N° 89
Costa Rica. Income, fixed Internet access, percentage distribution by speed, 2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

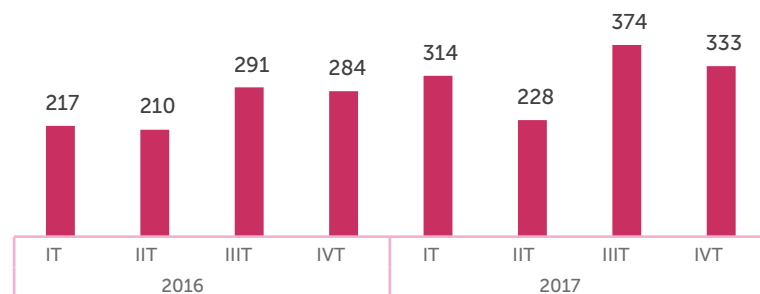
Graph N° 90
Costa Rica. Subscriptions, wholesale access to fixed Internet, 2015 – 2017
(Annual numbers)



2017 registered
49
more connections
than 2016.

Source: SUTEL, General Directorate for Markets.

Graph N° 91
Costa Rica. Subscriptions, wholesale access to fixed Internet, 2016 -2017
(Quarterly numbers)



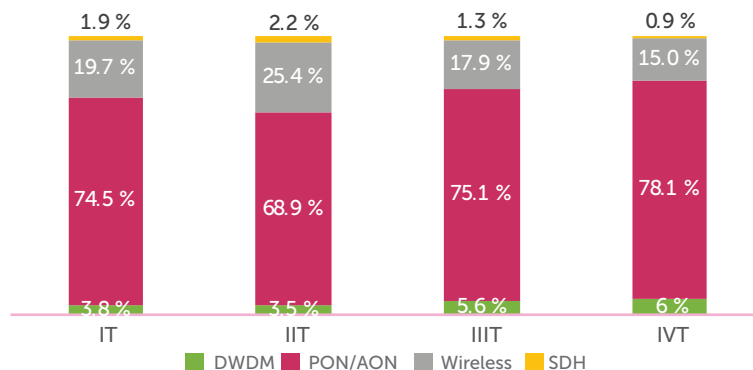
Source: SUTEL, General Directorate for Markets.



Graph N° 92

Costa Rica. Subscriptions, wholesale access to fixed Internet, percentage distribution by technology, 2017

(Quarterly numbers)

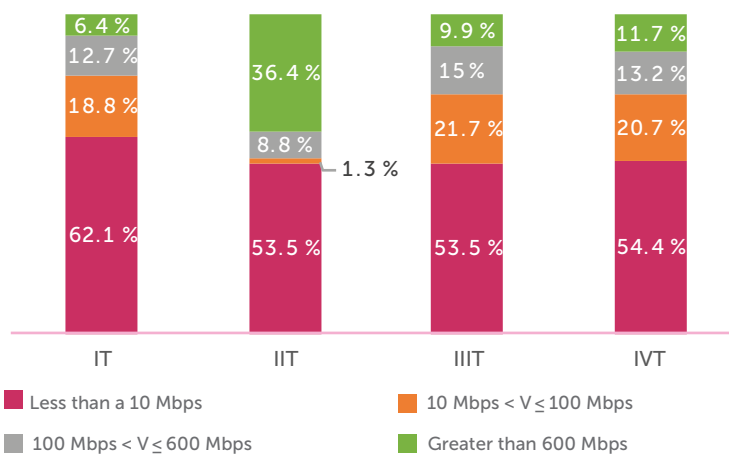


Source: SUTEL, General Directorate for Markets.

Graph N° 93

Costa Rica. Subscriptions, wholesale access to fixed Internet, percentage distribution by speed range, 2017

(Quarterly numbers)

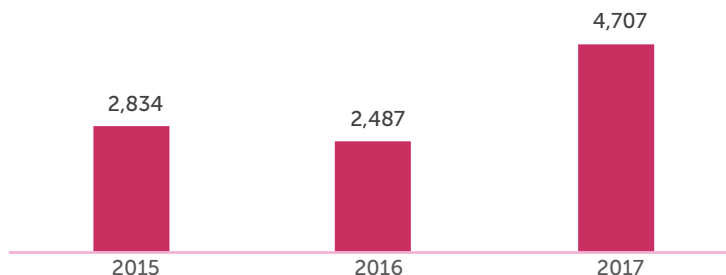


Source: SUTEL, General Directorate for Markets.

Graph N° 94

Costa Rica. Income, wholesale access to fixed Internet, 2015 – 2016

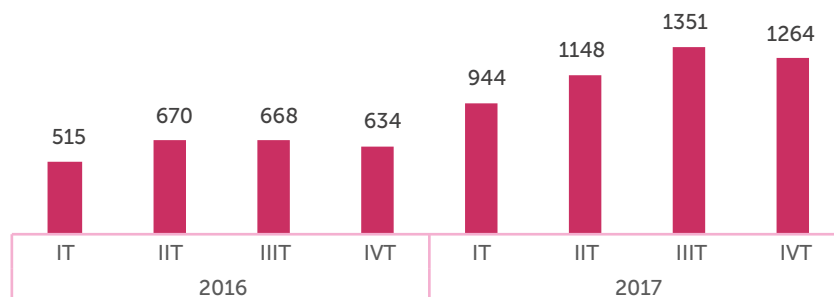
(Annual numbers in millions of colones)



Source: SUTEL, General Directorate for Markets.

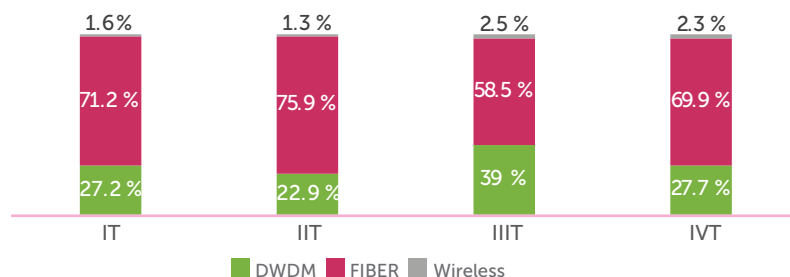


Graph N° 95
Costa Rica. Income, wholesale access to fixed Internet, 2016 -2017
 (Quarterly numbers in millions of colones)



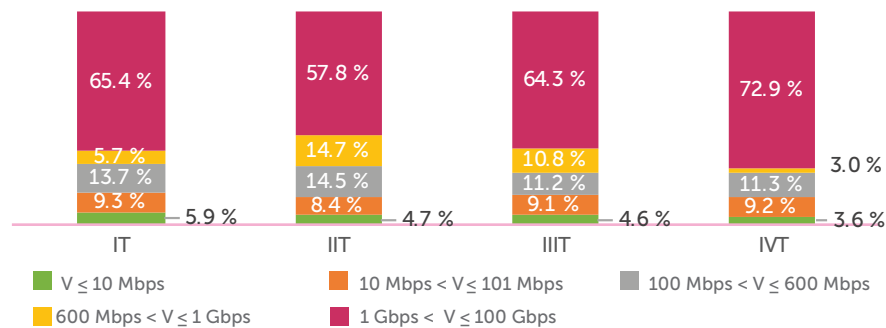
Source: SUTEL, General Directorate for Markets.

Graph N° 96
Costa Rica. Income, wholesale access to fixed Internet, distribution by technology, 2017
 (Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

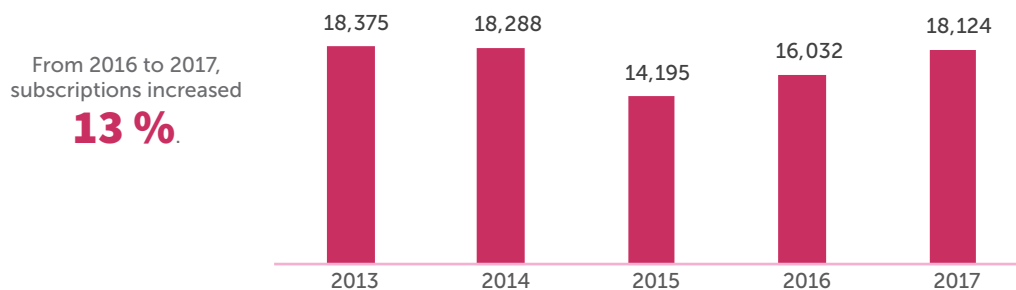
Graph N° 97
Costa Rica. Income, wholesale access to fixed Internet, percentage distribution, by speed range, 2017
 (Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

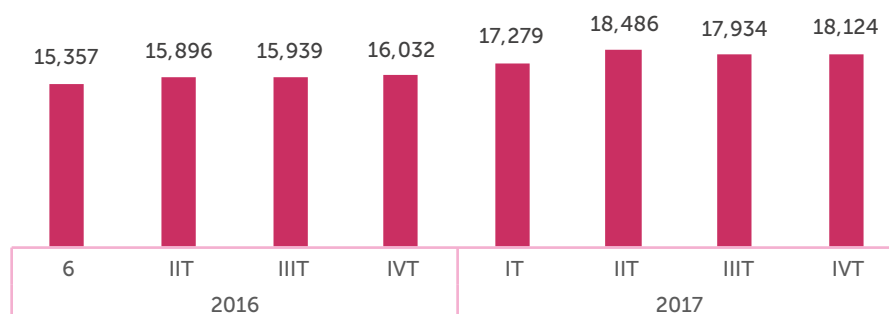


Graph N° 98
Costa Rica. Connections, dedicated lines service, 2013 – 2017
(Annual numbers)



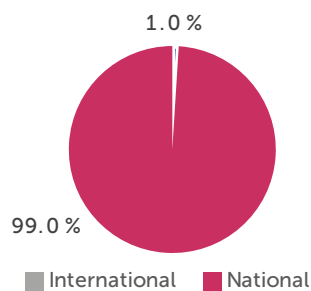
Source: SUTEL, General Directorate for Markets.

Graph N° 99
Costa Rica. Connections, dedicated lines service, 2016 -2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

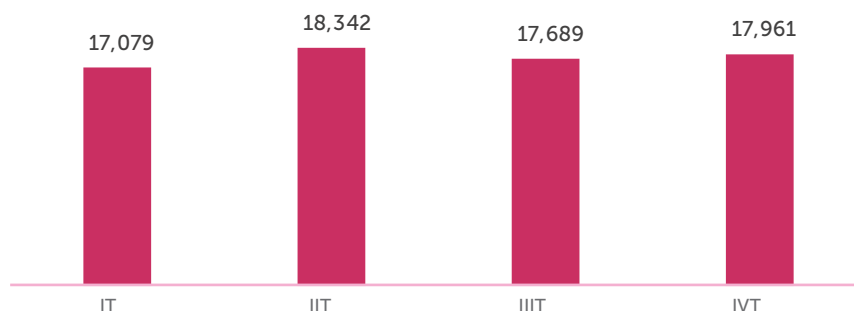
Graph N° 100
Costa Rica. Connections, dedicated lines service, according to geographical locations, 2017
(Numbers at the end of the year)



Source: SUTEL, General Directorate for Markets.

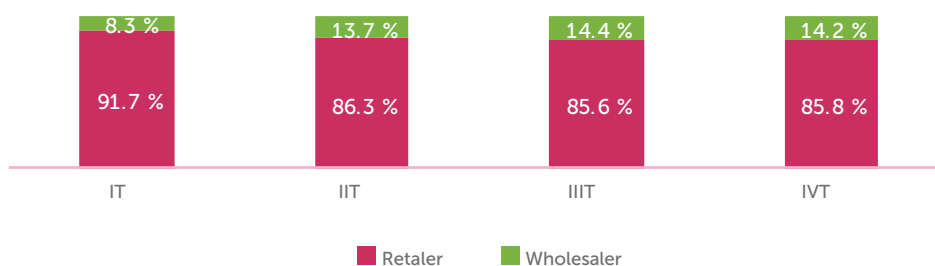


Graph N° 101
Costa Rica. Connections, dedicated line service, customers in the national territory, 2017
(Quarterly numbers)



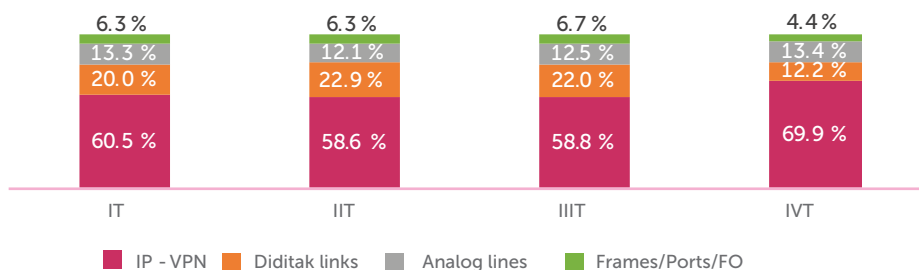
Source: SUTEL, General Directorate for Markets.

Graph N° 102
Costa Rica. Connections, dedicated line service, distribution of national customers, by retail and wholesale segments, 2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

Graph N° 103
Costa Rica. Connections, dedicated line service, retail segment, distribution of national customers, by technology, 2017
(Quarterly numbers)

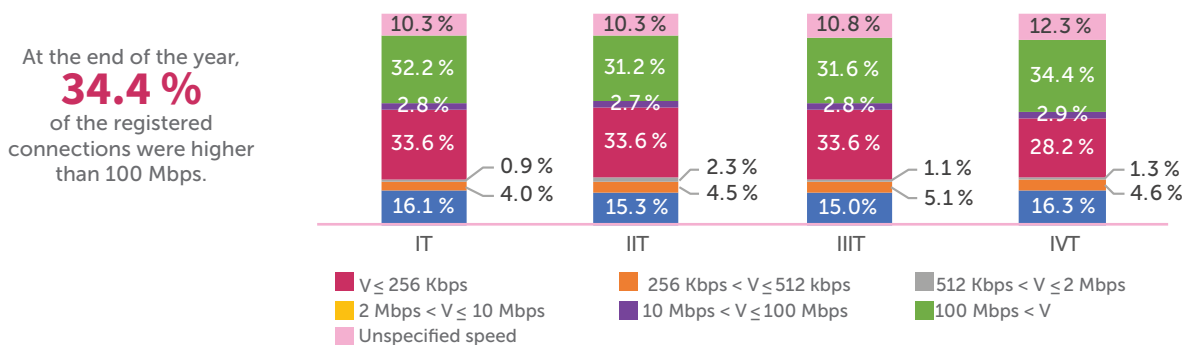


Source: SUTEL, General Directorate for Markets.



Graph N° 104

Costa Rica. Connections, dedicated line service, retail segment, national customer distribution, by speed, 2017
(Quarterly numbers)

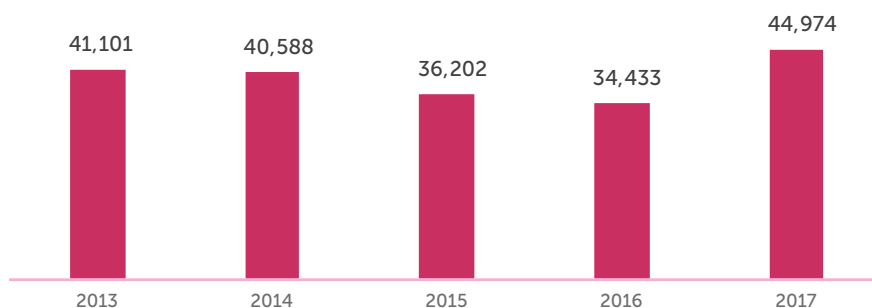


Source: SUTEL, General Directorate for Markets.

Graph N° 105

Costa Rica. Income, dedicated lines service, 2013 – 2017
(Annual numbers in millions of colones)

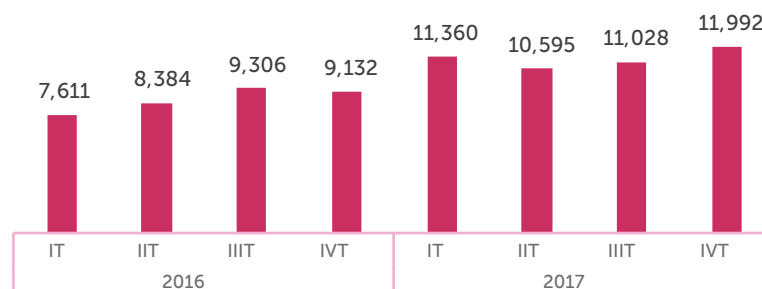
From 2016 to 2017, revenues increased **30.6 %**.



Source: SUTEL, General Directorate for Markets.

Graph N° 106

Costa Rica. Income, dedicated lines service, 2016 – 2017
(Quarterly numbers in millions of colones)

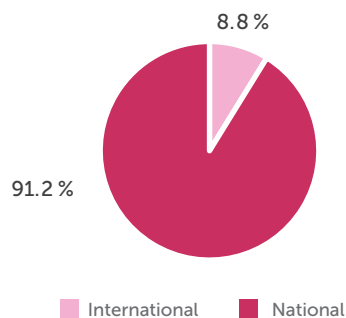


Source: SUTEL, General Directorate for Markets.



Graph N° 107
Costa Rica. Income, dedicated lines service, according to geographic location,
2017

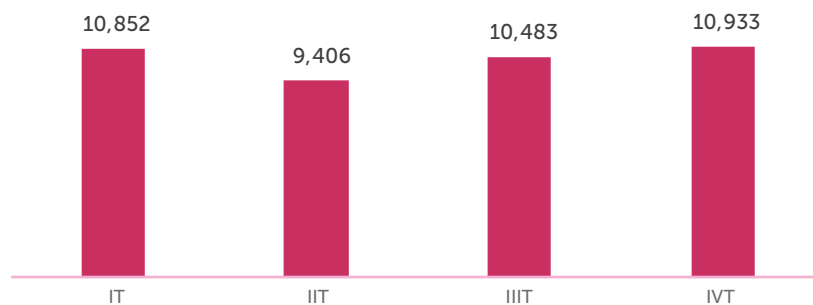
(Numbers at the end of the year)



Source: SUTEL, General Directorate for Markets.

Graph N° 108
Costa Rica. Income, service of dedicated lines, customers in the national
territory, 2017

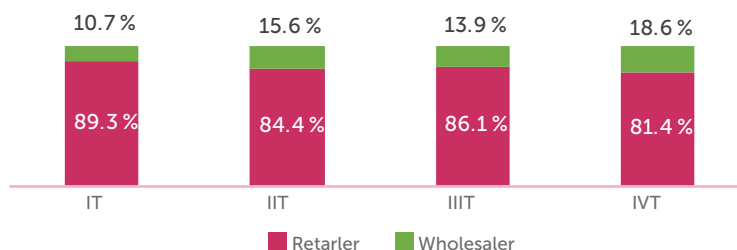
(Quarterly numbers in millions of colones)



Source: SUTEL, General Directorate for Markets.

Graph N° 109
Costa Rica. Income, service of dedicated lines, distribution of national clients,
by retail and wholesale segments, 2017

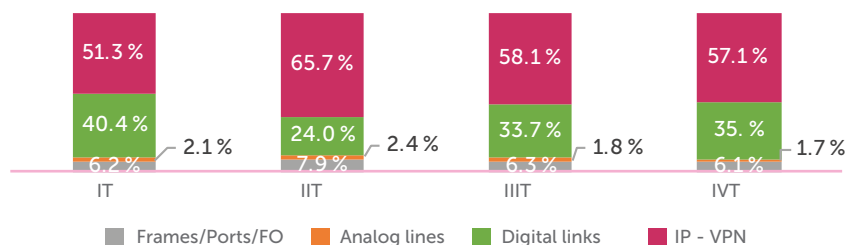
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.



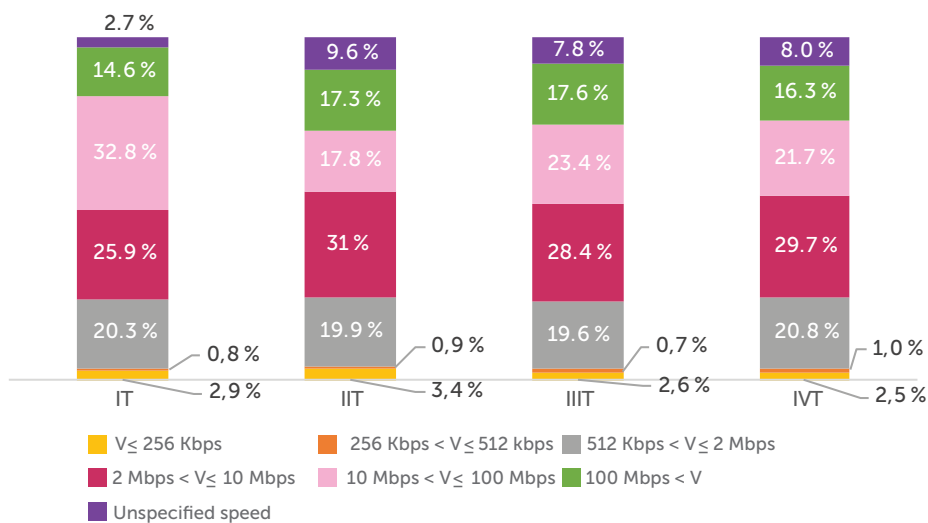
Graph N° 110
Costa Rica. Income service of dedicated lines, retail segment, distribution of national customers, by technology, 2017
(Quarterly numbers)



Source: SUTEL, General Directorate for Markets.

Graph N° 111
Costa Rica. Income, service of dedicated lines, retail segment, distribution of national customers, by speed, 2017
(Quarterly numbers)

At the end of the year,
29.7 %
of the income were
higher than 2 Mbps
and lower than 10
Mbps.



Source: SUTEL, General Directorate for Markets.



SUBSCRIPTION TELEVISION SERVICE





SUBSCRIPTION TELEVISION SERVICE

The total subscription to the television service by subscription totaled 831,907 in 2017 and the income generated for this 2017, registered an increase of 6 % compared to 2016, totaling 148,706 millions of colones.

This section presents the analysis of the different modalities of the subscription television service: those that transmit or retransmit television and audio signals to a group of users who subscribe the service through a contract. They pay the provider, with which they need a network conformed by a *Head End*¹ for wired distribution, or a satellite station for wireless distribution to access users².

To date, the main subscription television services are cable subscription television, subscription television by wireless means (satellite and microwave) and Internet subscription television (IPTV). Access to these services depends on the means by which the subscriber receives the Internet (wired or wireless).

In this way, it is relevant to point out that this analysis is focused on the period between December 2016 and December 2017. However, a longitudinal analysis is maintained for some approaches since December 2013. As said above and consequently with the rest of the

sections included in this report, this chapter examines the dynamics presented by the subscriptions and the total revenue of the subscription television service.

Subscriptions

In the case of subscriptions to this service, they reached 831,907 for 2017. This means 10,332 subscriptions more in relation to the previous year, which represents an increase of 1 % with respect to the previous year. In 2016, the subscription television service showed a growth of 24,345 subscriptions (3 %) in relation to 2015, a situation that contrasts with the 9 % that represents the increase of 64,684 subscriptions of 2014 versus 2015; that is, the growth of the number of subscribers is increasingly low, as shown on [graph N° 112](#). In the particular case of the period that is being considered (2013-2017), the number of subscriptions increased by 190,865, which means a 7 % growth from 2013 to 2017.

¹ Head End: refers to the telecommunications network, the place where the programming originates and the distribution network begins. Normally, signals are received from satellites, broadcast stations, even the Internet, and are made available for distribution.

² Users or subscribers. They can be residential or commercial.



Meanwhile, when comparing 2017 and 2016 regarding the behavior of subscriptions from the quarterly perspective, growth rates are observed during the period of analysis that maintain a certain regularity. However, they tend to fall because, as stated in previous reports, the first two quarters of each year show a growth rate higher than the third and fourth quarters. In this regard, for the fourth quarter of 2017 there were 10,332 new subscriptions compared to the same period of 2016 (see [graph N° 113](#)).

Regarding subscriptions by type of access technology for 2017, the predominance in the subscriptions market continues with coaxial cable, with 68 %, followed by satellite television with 29 %, and finally television over IP and multipoint that agglutinate the remaining 3 %, as shown on [graph N° 114](#).

According to this percentage composition, the evolution of participation by technology from 2013 to 2017, for the last year, shows a different perspective from the one presented in the last five years, particularly the cable service that increases one point percentage in its market share during the period, as shown in [graph N° 115](#). This last increase is mainly due to the increase of 15,494 subscriptions of this technology, as well as the 7,352 new subscriptions in the services of IP and multipoint television, together with a decrease of 12,605 in the satellite service.

In relation to this issue, it is to point out the fact that, for the 2016-2017 period, the TV over IP service continues to grow, 50 % for this last year, which represents the 7,352 new subscriptions ([see table N° 16](#)).

With respect to the penetration of this service in relation to the population, the indicator continued for 2017 with 17 %, and the number of subscriptions to the service per 100 homes, which remains 56 % for the second consecutive year. However, for 2017, it is highlighted that 69 % of homes in the country (1,031,825) have some subscription television service, which means an increase of 3 % and, in absolute terms, 59,589 homes more than past year. Regarding the latter, it is important to note the narrowing of the gap of 29 percentage points between homes that have this

service and those that lack it in 2017. In addition to the decrease in the percentage of homes with access to the open television service, whose average rate of decrease is 5 % from December 2013, until December 2017 ([see graphs N° 116, N° 117 and N° 118](#)).

Regarding the cantonal geographical breakdown of the total subscription to the subscription television service, the [figure N° 8](#) shows the penetration of the service in the cantons with respect to their population⁴. Therefore, the canton of Garabito, in the province of Puntarenas stands out, with 51.8 %. In contrast, the canton of Jiménez, in the province of Cartago, presents six subscriptions per one hundred inhabitants in the canton ([see table N° 17](#)).

2017 reported 7352 new subscriptions to the service of paid TV over IP, for an annual growth of 50 %.

Income

The income generated by the provision of subscription television service, once again, shows a growing tendency. Therefore, by 2017, compared to 2016, the growth of 6 % is equivalent to 8,175 million. In 2017, revenues reach 148,706 million Colones. This amount implies an annual increase of 9 % compared to 2013, the year when this service generated 103,802 million Colones ([see graph N° 119](#)).

Likewise, from the analysis of the dynamics of income broken down on a quarterly basis, it appears that the average quarterly income for 2017 is 37,176 million

³ The map presents a cantonal segmentation of five categories, grouping the same number of cantons in them.

⁴ National Institute of Statistics and Census. Estimates and projections of population districts by sex and age groups, 2000 - 2025.



Colones. When comparing the quarterly data for the years 2016 and 2017, a quarterly average variation rate of 1 % is reflected, which in absolute terms implies an average increase of 547 million Colones per quarter, a similar behavior presented in the two previous years ([see graph N° 120](#)).

Regarding the evolution of the percentage composition of income according to technology, the [graph N° 121](#) can be visualized, which shows the distribution of income for 2017 and previous years. As an example, the coaxial cable service has 70 %, the satellite service 27 %, and the rest of the technologies represent 3 %, this in 2017. The data demonstrate (like the subscriptions) how the service Cable maintains the largest market share in this area.

However, when examining this distribution over the 2013-2017 period, dynamism can be seen in the market: the cable television service shows a percentage decrease which goes from 78 % in 2013, to 70 % in 2017 (eight points percentage less participation during the past five years); satellite technology goes from 22 % in 2013 to 27 % in 2017; and, finally, the other technologies (IPTV and MMDS-multichannel multipoint) that also increased their percentage share in 2017 with 3 %, when in 2013 the percentage was less than 1 %.

Regarding the change between December 2016 and December 2017, [table N° 18](#) complements the analysis on the percentage distribution per technology. According to this, the decrease of four percentage points experienced by the television service is derived of a stability in the income of this service and an increase in the income of the rest of the technologies: IPTV and MMDS-multichannel multipoint with a 75 % increase in its revenues for 2017, as well as satellite television, with 19 %.

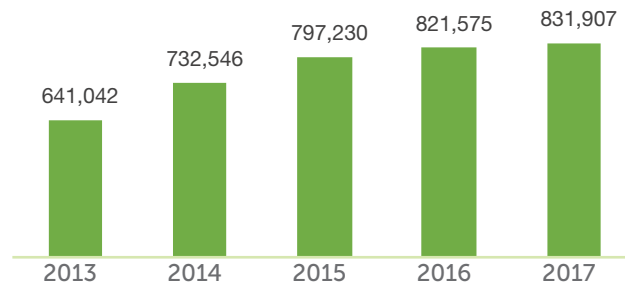
With respect to the average income per subscriber presented between 2013 and 2017, the subscription television service shows an average annual variation of 2.5 %, equivalent to 1,402 Colones from 2013 to 2017.

The average income per subscriber according to access technology has had, on the other hand, a behavior that differs according to the technology that is considered. The income of the cable service in the period 2017, in relation to 2016, decreased approximately 462 Colones.

A similar behavior occurs in the multi-channel multipoint modality, which decreased around 165 Colones, unlike the rest of the modalities, which show an increase of 2,808 Colones in satellite and 2,321 Colones in IP ([see graph N° 122 and table N° 19](#)).



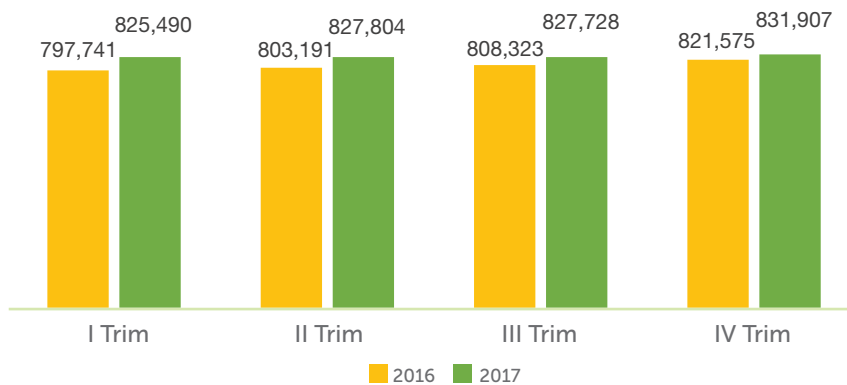
Graph N° 112
Costa Rica. : Total Subscriptions to Pay TV, 2013 - 2017.
(Annual Figures)



831,907
TV subscriptions for
2017.

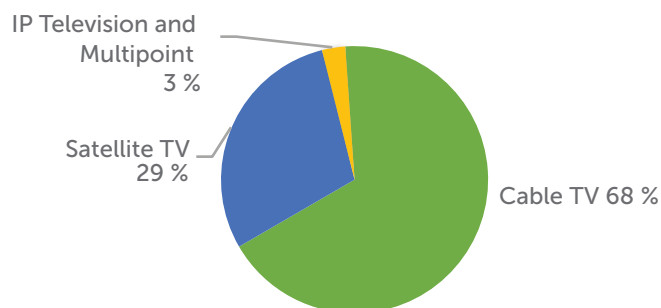
Source: SUTEL, General Directorate for Markets.

Graph N° 113
Costa Rica. Subscriptions to Pay TV by Quarter, 2016-2017.
(Annual Figures)



Source: SUTEL, General Directorate for Markets.

Graph N° 114
Costa Rica. Distribución porcentual de las suscripciones al servicio de
televisión por suscripción según tecnología de acceso, 2017
(Cifras en porcentajes)



68 %
of subscriptions are
offered through
Cable TV.

Source: SUTEL, General Directorate for Markets.

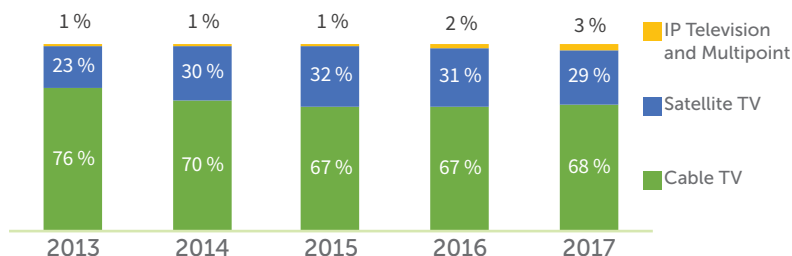


Graph N° 115

Costa Rica. Evolution of Percentage Participation of Pay TV by Technology, 2013-2017.

(Figures in percentages)

1 %
Growth of IP Television
and Multipoint for 2017.



Source: SUTEL, General Directorate for Markets.

Table N° 16

Costa Rica. Total subscriptions to pay television, according to access technology, 2013-2017

(Annual figures)

7,352
new subscriptions for
IP Television in 2017.

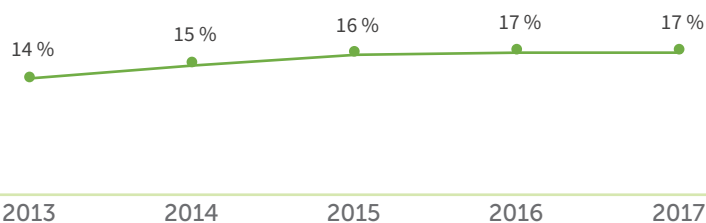
| Technology | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------|---------|---------|---------|---------|
| Cable TV | 489,848 | 510,390 | 531,807 | 548,113 | 563,607 |
| Satellite television | 146,936 | 217,140 | 257,986 | 257,486 | 244,881 |
| Television over IP | 3,071 | 4,191 | 6,434 | 14,702 | 22,054 |
| Multipoint Television | 1,187 | 825 | 1,003 | 1,274 | 1,365 |
| Total | 641,042 | 732,546 | 797,230 | 821,575 | 831,907 |

Source: SUTEL, General Directorate for Markets.

Graph N° 116

Costa Rica. Subscriptions to Pay TV per each 100 inhabitants, 2013- 2017

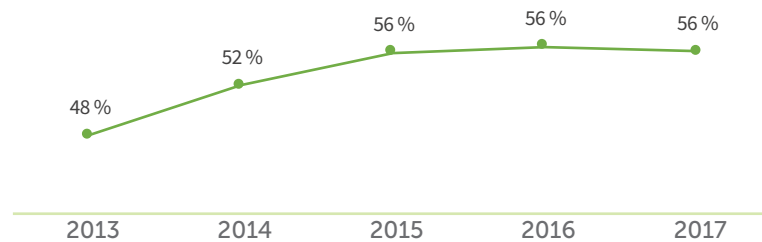
(Figures in percentages)



Source: SUTEL, General Directorate for Markets.

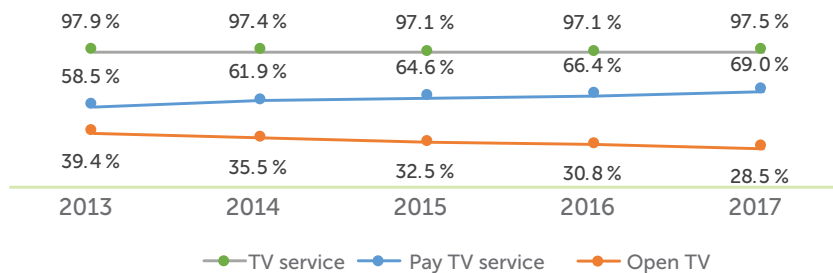


Graph N° 117
Costa Rica. Subscriptions of Subscription TV per each 100 houses, 2013- 2017
(Figures in percentages)



Source: SUTEL, General Directorate for Markets.

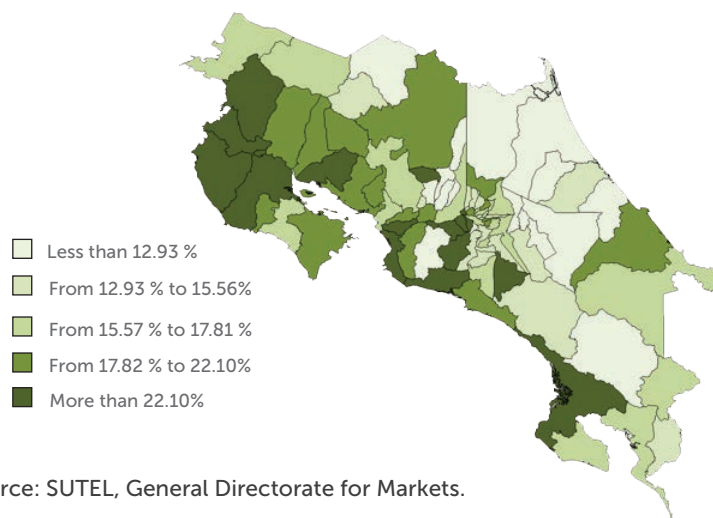
Graph N° 118
Costa Rica. Percentages of home with some TV service, 2013- 2017
(Figures in percentages)



3 %
more houses have
subscription TV.

Source: SUTEL, General Directorate for Markets.

Figure N° 8
Costa Rica. Subscriptions to Pay Television per 100 inhabitants
per canton, 2017



Source: SUTEL, General Directorate for Markets.



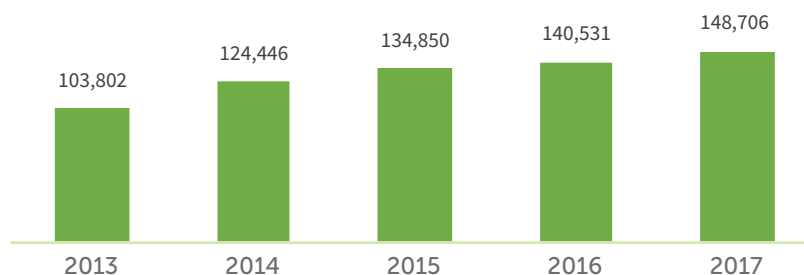
Table N° 17
Costa Rica. Subscriptions to Pay Television per 100 inhabitants per canton, 2017
 (figures in percentage)

| CANTON | PERCENTAGE | CANTON | PERCENTAGE | CANTON | PERCENTAGE | CANTON | PERCENTAGE | CANTON | PERCENTAGE |
|-------------|------------|---------------|------------|---------------------|------------|---------------|------------|---------------|------------|
| GARABITO | 51.8 | HOJANCHA | 21.8 | ESPARZA | 17.8 | BARVA | 15.4 | NARANJO | 12.9 |
| ALFARO RUIZ | 31.1 | MONTES DE ORO | 21.7 | NANDAYURE | 17.7 | PALMARES | 15.3 | GRECIA | 12.8 |
| SANTA CRUZ | 30.6 | AGUIRRE | 21.4 | MORAVIA | 17.6 | LEÓN CORTÉS | 15.1 | TURRIALBA | 11.9 |
| CARRILLO | 28.7 | MONTES DE OCA | 21.3 | LA CRUZ | 17.6 | FLORES | 15.0 | SARAPIQUI | 11.1 |
| PARRITA | 26.5 | TILARÁN | 20.7 | SAN PABLO | 17.4 | GUATUSO | 14.6 | POCOCÍ | 11.0 |
| BELÉN | 25.8 | TURRUBARES | 20.6 | TARRAZÚ | 17.4 | GOICOECHEA | 14.5 | MATINA | 10.5 |
| DOTA | 25.0 | SAN MATEO | 20.1 | VÁSQUEZ DE CORONADO | 17.2 | PARAISO | 14.5 | BUENOS AIRES | 10.2 |
| NICOYA | 24.9 | PUNTARENAS | 20.0 | CARTAGO | 17.1 | DESAMPARADOS | 14.3 | ALAJUELITA | 10.2 |
| SANTA ANA | 24.8 | CANAS | 19.7 | SANTO DOMINGO | 17.1 | TIBÁS | 14.3 | VALVERDE VEGA | 10.2 |
| ACOSTA | 24.8 | HEREDIA | 19.5 | LA UNIÓN | 17.0 | SAN RAFAEL | 14.2 | GUACIMO | 10.1 |
| OSA | 24.7 | BAGACES | 19.4 | TALAMANCA | 16.7 | ASERRÍ | 14.2 | POÁS | 9.8 |
| ESCAZÚ | 23.9 | SAN CARLOS | 18.4 | COTO BRUS | 16.7 | SIQUIRRES | 14.1 | PURISCAL | 9.7 |
| LIBERIA | 23.4 | SAN ISIDRO | 18.3 | GOLFITO | 16.6 | PÉREZ ZELEDÓN | 13.7 | OREAMUNO | 9.7 |
| MORA | 22.9 | ATENAS | 18.2 | SAN JOSÉ | 16.2 | SANTA BÁRBARA | 13.4 | LOS CHILES | 9.6 |
| OROTINA | 22.4 | LIMON | 18.2 | SAN RAMÓN | 16.0 | CORREDORES | 13.1 | ALVARADO | 7.3 |
| ABANGARES | 22.3 | CURRIDABAT | 18.0 | UPALA | 15.7 | EL GUARCO | 13.0 | JIMÉNEZ | 6.6 |
| | | | | ALAJUELA | 15.6 | | | | |

Source: SUTEL, General Directorate for Markets.

Graph N° 119
Costa Rica. Total income from subscription television service, 2013 - 2017
 (Annual figures in million of Colones)

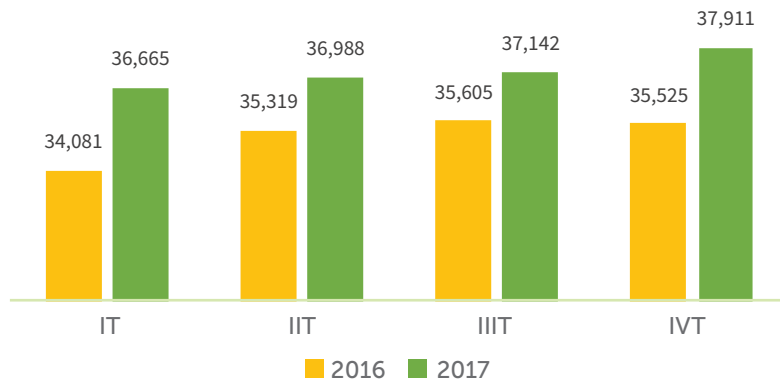
6 %
 increase in
 subscription
 television service
 revenues.



Source: SUTEL, General Directorate for Markets.



Graph N° 120
Costa Rica. Total Income of Subscription Television per Quater, 2016 - 2017
 (Quarterly figures in millions of colones)

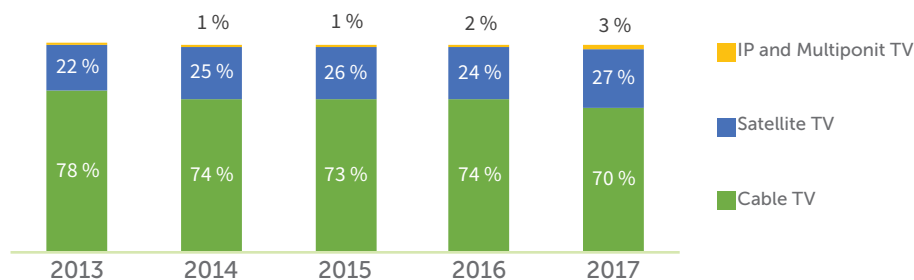


The average quarterly income for 2017 is

37,176
million Colones.

Source: SUTEL, General Directorate for Markets.

Graph N° 121
Costa Rica. Evolution of the percentage distribution of income in the subscription television service, 2013-2017
 (Annual figures in percentages)



Source: SUTEL, General Directorate for Markets.

Table N° 18
Costa Rica. Total Income for Pay Television per Access Technology.
 (Figures in million of Colones, 2013-2017)

| Technology | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|
| Cable TV | 80,810 | 91,994 | 98,859 | 103,927 | 103,742 |
| Satellite TV | 22,484 | 30,721 | 34,570 | 34,220 | 40,797 |
| Television over IP and Multipoint | 508 | 1,675 | 1,421 | 2,384 | 4,166 |
| Total | 103,802 | 124,446 | 134,850 | 140,531 | 148,706 |

Television over IP and Multipoint increase revenues

1,783
million Colones (75 %) in 2017.

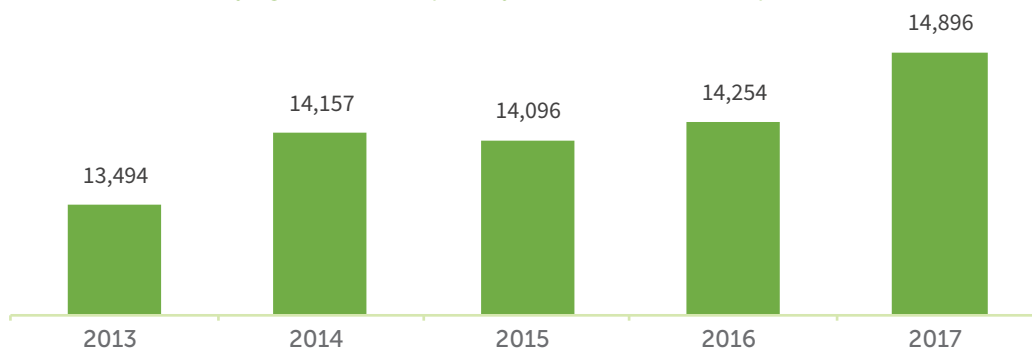
Source: SUTEL, General Directorate for Markets.



Graph N° 122

Costa Rica. Average Monthly Income per Subscriber of Pay Television Service, 2013-2017.

(Monthly Figures based on quarterly information. In Colones per subscriber)



Source: SUTEL, General Directorate for Markets.

Table N° 19

Costa Rica. Average Income per Subscriber of Pay Television, per Access Technology, 2013 - 2017.

(Monthly Figures based on quarterly information. In Colones per subscriber)

| Technology | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------|--------|--------|--------|--------|
| Cable TV | 13,747 | 15,020 | 15,491 | 15,801 | 15,339 |
| Satellite TV | 12,752 | 11,790 | 11,167 | 11,075 | 13,883 |
| Television over IP | 12,138 | 32,169 | 17,760 | 13 234 | 15,555 |
| Multipoint Television | 4,279 | 5,758 | 4,101 | 3,198 | 3,033 |
| Total | 13,494 | 14,157 | 14,096 | 14,254 | 14,896 |

Source: SUTEL, General Directorate for Markets.



COMMERCIAL OFFERS AND PRICES





COMMERCIAL OFFERS AND PRICES

In the case of mobile services, commercial offers were characterized by an increase in the maximum amount of data to be downloaded, accompanied by an average reduction in prices of 4.32 %.

COMMERCIAL OFFERS OF MOBILE TELECOMMUNICATIONS SERVICES

The information submitted by mobile telephony operators via SUTEL's tool "*Mi Comparador*"¹, first assesses the main characteristics of the commercial offers associated to this service in the modality post-paid, corresponding to 2017.

Regarding the operation of the respective software, information on mobile telephony for the month of September 2016 was collected and to December of 2017, completing information for 16 months. During this period, 2,652 post-paid plans submitted data, were equivalent to an average of 166 offers per month submitted for all mobile telephony operator. The distribution per operator of this 2,652 offers received is broken down on [table N° 20](#).

It is important to note that the fact that mobile operators must submit the commercial offers available

to the public, on a monthly basis, implies that many of the offers entered in the tool *Mi Comparador*, for a particular month, appear in the following month while those offers stay aid and, therefore, represent an option for potential users. Once the operator withdraws the offer, such information must be submitted to SUTEL for inclusion in *Mi Comparador*. [Table N° 85](#) of the statistical Annex show a breakdown of the offers submitted in December 2016 that were valid in December of 2017.

Qualitative characterization of the commercial offers for mobile telephony

Considering the information compiled thru *Mi Comparador*, it is possible to evaluate the offers of the post-paid modality that presents both a higher number and higher variability of offers. In this sense, and starting initially with the information related to offers from the months of December, both between 2016 and 2017, the following are the main qualitative differences between the offers for each period:

¹ With this tool, operators and telecommunications service providers submit to SUTEL information related to different commercial offers (plans and promotions) available to users.



- An increase in the data download speed via the service of mobile Internet, mainly in the case of the offers of two operators (Claro and ICE). In average, and considering baskets of consumption of typical users, previously defined, the average speed doubled from 4 Mbps to 8 Mbps².
- The utilization as one of the characteristic or proposals of value of the offers of mobile telephony of the Data Download concept, under the understanding that such download represents the maximum number of data to download³.
- An Increase in the maximum amount of data to download, under the understanding that access and utilization of data are reasons that justify, more and more, that people require a mobile telephony connection.
- Once again, considering the average data for typical users, such maximum download increased the values between 2 and 5 gigabytes to download between 6 and 8 gigabytes.
- The fact that the one of the key elements for the price of offers in December of 2016 was the data download speed, regarding the offers of December 2017 such element loses importance before the presence of Data Download as a relevant feature in the corresponding offers.

While the increase in download speed is an observable feature in the offers received throughout the year and is related to the availability of new networks that allow higher speed connections, particularly the 4G network, the other three characteristics are included in the offers received in the last months of 2017, particularly in December of this year. Such characteristics are associated to the approval or resolution RCS-248-2017 of September 22, 2017, where SUTEL declared competition in the market of mobile telecommunications and overturned the resolution of fair use policy.

Quantitative characterization of the commercial offers for mobile telephony

The quantitative evaluation of the commercial offers associated to the mobile telephony service in its post-

paid modality required consideration of both the number of minutes that may be utilized depending on the offer, the maximum number of messages to send, the maximum data download, the download speed of that data and additionally, the value the user pays for the service of mobile telephony.

The corresponding evaluation is separated in two periods. The first one comprises from January to September of 2017 (when resolution RCS-248-2017 went into effect) and therefore, when the promulgation of competition in the mobile telephone market; and the second one, corresponds to the last quarter of the year (when the market had already declared open competition and therefore, the tariff regulation coming from SUTEL was in place).

In average, considering the consume “basket” of typical users, the average download speed offered in the offers of mobile providers doubled from 4 Mbps to 8 Mbps.

Commercial offers for the period January – September of 2017

In terms specifically to the commercial offers that belong to quartile 3, as aforesaid, and further explained on [table N° 87](#) of the statistical Annex, the first of those offers was presented by Movistar in June of 2017 and is called Plan 4G@3 with terminal. This plan include 250 minutes for calls off the network, 250 messages and 4 Gb of data download, with a cost to the user of 24,000 Colones. After this, in August of 2017, such offer was modified in the sense it no longer included the terminal I (Plan 4G@3 without terminal), reducing the cost to 20,900 Colones.

The date of presentation of this offer must be considered for its valuation, as the mobile telephony market had not yet been declared in effective competition. Thus, the analysis of the benefit provided to the user must consider

² The characteristics of the consume baskets indicated for typical users are included under Methodology in this report.

³ The first commercial offer in the modality post-paid that included “Data download” as one of the features was submitted by Movistar on February of 2017.



the maximum rates authorized by SUTEL for each of the three components of them⁴. Having said that, it can be concluded that if a user takes maximum advantage of the corresponding download, the plan will mean savings with regards to what he would pay without a plan.

In fact, downloading the four gigabytes included in the offer, valued at the maximum rate authorized, would have a cost of 36,071 Colones, opposed to 20,900 Colones of the plan. If on the contrary, if we consider the maximum rate authorized for mobile telephony calls (34 Colones) and the corresponding to messages of 3 Colones, the maximum number of minutes of conversation plus delivery of 250 messages would have a cost of 9,250

which, in unit terms means a cost per gigabyte to download of 1,844 Colones, as explained on [table N° 23](#).

The information shows that in the case of the user associated to the quartile 3: (i) Prices coming from the respective offers result significantly lower than the maximum rates authorized by SUTEL for mobile telecommunications services and (ii) those prices show a decreasing trend throughout the time.

As to the quartile 4, as previously explains, the average basket for a user is defined as that including 600 minutes of calls to any network, the delivery of 150 messages and the maximum download of 8 gigabytes. In this case, the number of commercial offers that correspond to this characterization ([table N° 88](#) of the statistical Annex) is more reduced than the ones that define a user in quartile 3. Under those circumstances and for the objective of this analysis, we consider the offers that meet at least one of the conditions indicated before, particularly minutes available (600) or maximum data download (8 gigabytes).

The first of the commercial offers in 2017 that meets these requirements was included in Mi Comparador by Claro in June of 2017 and is called Massive Postpaid without Limit 4. [Table N° 24](#) shows the way this offers were evaluated.

This offer, just as in the case of those identified in quartile 3, means a data download price to the user much lower than the maximum authorized by SUTEL at the time. However, the resulting implicit price is slightly superior to the one determined for the first of the offers associated to quartile 3: Plan 4G@3 without terminal.

A second offer that deems evaluation corresponds to the modification of the Plan 4G@3 with terminal, proposed by Movistar in August of 2017 and considered within the options to the user under quartile 3. It is also included as an option to a user associated with quartile 4 as it considers a maximum data download of eight gigabytes. The respective valuation includes a price per downloaded gigabyte of 1,844 Colones, just as explained in [table N° 23](#).

Another offer that meets the minimum requirement of download of eight gigabytes is the one corresponding to the modification of the Offer Without Limit 3 presented

The prices of mobile offers result lower than the maximum rates authorized by SUTEL.

colones, which means that the download of the four gigabytes included in the plan would be worth 11,650 colones. In this sense, each gigabyte downloaded would have a value of 2,913 colones, a figure much lower than the 9,018 Colones authorized by SUTEL as the maximum rate at that time. Refer to [table N° 21](#).

On the other hand, as of August 2017 (date before the declaration of competition), the operator Claro presented a commercial offer (Not Limit 3 Pure) that included 300 minutes of telephone conversation, delivery of 300 messages and a download of four gigabytes, with a cost to the user of 18,500 Colones. This way, and following the procedure describe in the previous paragraph, it determines that the cost of downloading four gigabytes would reach 7,400 Colones, equivalent to a cost per gigabyte for downloading of 1,850 Colones ([see table N° 22](#)).

During this same month, Movistar modified the Plan 4G@3 with terminal, increasing from four to eight the maximum data allowed for download, without adding an increase in the cost of the plan; and once again the application of the calculation mentioned above results in a cost of 14,750 Colones to download eight gigabytes

⁴ Considering that the delivery of text messages is not a telecommunications service, there is no maximum price authorized by SUTEL. Instead, there is a price of 3 Colones per message. Price mobile service providers have been charging for the service.

by Claro in September of 2017, that increases the maximum download capacity to eight gigabytes and the value of the plan at 24,500 Colones. Its valuation includes an implicit price of maximum download of 13,400 Colones, equivalent to a price per gigabyte of download of 1,675 Colones ([see table N° 25](#)).

Just as in the case of the user associate to quartile 3, the previous data confirms that for the period prior to the promulgation of the competition in mobile telephony, users who met with the characterization of quartile 4 faced prices lower each time and much lower than the maximum amounts authorized by SUTEL.

Commercial offers for the period October - December 2017

For the period following the declaratory of competition in the mobile telephone market, an offer defined within the quartile 3 was submitted by ICE in December of 2017 (Plan 4G k3) and includes 300 minutes of telephone conversation, delivery of 300 messages and download of five gigabytes. In this case, following the procedure of applying for comparative purposes the maximum rates to calls and corresponding messages as nearby reference⁵, the consequence is that the download of the five gigabytes has a cost of 6,900 Colones, meaning a cost per gigabyte of 1,380 Colones. [Refer to table N° 26](#).

On the other hand, and pertaining to quartile 4, an offer that additionally meets one of the minimum requirements considered for the determination of the basket corresponding to such quartile (in this case 600 minutes conversation) is presented by ICE on December of 2017 (Plan 4G k4) and includes 800 minutes of telephone conversation, the delivery of 600 messages and download of seven gigabytes. For valuation purposes, the cost of this offer to the client (26,000 Colones) does not even cover the total cost of calls and delivery of messages if this are added to the maximum rate set by SUTEL (29,000 Colones), thus, if all the different components of the plan were used (calls, messages and data) such data download would have no cost, as noted on [table N° 27](#).

Such results evidence that, independently from the user of reference used (quartile 3 or 4) and starting from the application of fixed prices in the case of telephone calls and the delivery of messages, such user has available at least one commercial offer that includes a cost per data download below the costs valid before the mobile telephone market opened for competition, maintaining a decreasing trend during the year 2017. Lower cost commercial offers herein mentioned are characterized by the inclusion of a greater availability of data download; because of this greater possibility in data download we can explain its lower relative price, according to the expectations of the declaratory of competition of SUTEL. Similar plans in terms of availability of minutes and delivery of messages show convergence regarding the total cost to the user.

Commercial offers for the service of fixed internet

As in the case of mobile telephony services, the information submitted by suppliers of fixed Internet service via the platform Mi Comparador allows the identification of the main characteristics of the commercial offers put together by those suppliers. Nonetheless, it is necessary to consider that in the case of fixed Internet, there are 54 suppliers providing the service⁶, some of who serve limited geographic areas, duly authorized, and who initially received authorization to provide the service of paid television. Such consideration must be taken into account when comparing the characterization of commercial offers from different operators.

Given this limitation, [table N° 28](#) includes a breakdown of the commercial offers carried out in 2017 by service providers who reported prices applicable exclusively to the service of residential fixed Internet, where oversubscription⁷ accounts for 20 users per connection. The table shows a download speed of eight Mbps per second and shows data from offers that were valid as of December of 2017 and available in the previous months.

Data compiled indicates that, out of the five suppliers considered, two of them did not implement any price

⁵ Though the maximum rates set by SUTEL were no longer valid starting in October of 2017, the fact that shoe prices continue being used by operators for the collection of mobile telephony service from users who do not have a plan and with the purpose of maintaining coherence with the analysis conducted in the above paragraphs, calculations are based on those maximum prices.

⁶ This number comes from the information received by SUTEL via the platform SITEL, it refers to the number of operators who submitted the respective templates.

⁷ Oversubscription refers to the number of connections to the service of internet by type of connection.

modifications; in fact, in the case of COOPELESCA, the download speed increase from one to 2 Mbps per second effective July 2017. Other two suppliers reduced their price in more than 3 % during 2017 and only one of those suppliers (Telecable) increased the price of the service by 4.1 %.

[Table N° 29](#) includes a breakdown of bundled commercial offers for fixed paid telephony available in most of the country. This because when it refers to the fixed Internet service, some of the commercial offers are provided in packages that include fixed telephone and paid TV subscription. The information included therein, related to packages offered by the four suppliers with national coverage, at a speed of at least 6 Mbps per second and an oversubscription of 20 subscribers per connection evidences that, in two of the cases prices remained without variation during 2017. In the case of the offers promoted by Telecable, there is a 3.5 % increase. On the other hand, the fourth offer (Cabletica) shows a price reduction of 0.9 % in the package called Triple Play that was registered during the last quarter of the year.

Evolution of the prices of fixed internet services and paid subscription

Fixed Internet prices reported at SITEL for services associated to an oversubscription of 1:20

To analyze the evolution of the prices of the service of fixed Internet, we need to consider the numbers reported by operators within the framework of SITEL's project, where each operator must indicate the average price charged for each service; in this case, the price for download speed contracted by each user.

Most operators and active suppliers in the country offer a service of Internet access with a level of oversubscription of 1:20 that may be offered at a lower price and therefore, becomes the option with the largest number of users, particularly in the asymmetric modality. This level of subscription is therefore offered, mainly to the residential sector and also to small and medium enterprises. [Table N° 30](#) shows a breakdown of the prices associated to the service during 2017, considering asymmetric speeds.

In general, you may note a direct relation between download speed and the corresponding rate; while a connection speed of 512/256 Kbps⁸ has an average price of 8,667 Colones, when the connection speed increase to 6,144/1024 Kbps, the average prices increases by 22,101 Colones.

The comparison of prices reported by operators at SITEL for the period 2013-2017 evidences that, considering connection speeds over 3,072/768 Kbps, it is showed an average reduction during biennium 2016-2017, respect to prices registered in the two previous years. In the case of speed 2,048/768 Kbps or lowers, that tendency is not perceived and there is similarity of the respective four years.

[Tables N° 31](#) and [graph N° 123](#) show the ranges of price variations for the different speeds, over the last four years

Fixed Internet prices reported at SITEL for services associated to an oversubscription of 1:5

The other level of oversubscription where there is an offer that allows associating prices with different connection speeds is the one for five services of link; that is, with a level of oversubscription of 1:5. In this case, considering the modalities of asymmetric connections, and just as what happened in the case of 1:20 oversubscriptions, the presence of a significant number of suppliers results in a direct relation between connection speed and price for most of the corresponding speeds. In fact, with the exception of the connection speed of 2,048/768 Kbps, whose associated price is lower than the one of its immediately lower speed (1,024/512 Kbps), in general, the faster the speed, the higher the price of the service. In accordance with the lower level of oversubscription, prices observed, that in average vary between 33,685 Colones for a connection speed of 512/256 Kbps and 137,160 Colones if the speed is 10,240/1,024 Kbps, are higher than those recorded with a 1:20 oversubscription. [Table N° 32](#) shows a breakdown of the prices (maximum, minimum and average) applied by suppliers in 2017 for speeds of asymmetric connection with a 1:5 level of oversubscription.

[Table N° 33](#) and [table N° 124](#) show the range of variation of the rates of the asymmetric Internet service provided in

⁸ For the fixed Internet service, the providers make their offers considering the speed connection, expressed in Kbps, being 1024 Kbps equivalent to one Mbps.

2017 and during the prior three years, considering a level of oversubscription of 1:5. In general prices valid in 2017 are similar, with slight variations in both directions, to the prices applied in previous year, excepting the values observed for speeds of 5,120/1,024 and 10,240/1,024 Kbps, that did exceed in at least 8 % those registered in 2015. It is important to note the sensible decrease of the average prices associated to this connection speed starting in 2015.

Regarding the prices of 1:5 oversubscription, average prices also show a growing trend ([table N° 34](#)) as the respective connection speed increases. The price associated to the connection speed of 5 Mbps (224,713 Colones) is an exception to this behavior, resulting lower than the average price corresponding to immediate lower connection speeds. Such figure, explained by a larger number of service offerors results in a price that in 2017 is below to the one reported in previous years, meaning that, in general, for the service of symmetric Internet 2017 prices show higher values than those previously recorded. Refer to [table N° 35](#) and [graph N° 125](#) for the corresponding data.

Comparison of prices reported at SITEL 2009-2007

The data available for the fixed Internet service, particularly those related to a level of over subscription of 1:20, allow a price comparison of those applied in 2009 and the ones valid in 2017. In this regard, consider that the rates valid in 2009 were maximum rates initially set by ARESEP and ratified later by the SUTEL under resolution RCS-615-2009. It is interesting to note that as consequence of the opening and, therefore, the increase in the number of internet providers, prices have experienced a reduction that, in average, reaches 51 % (as shown in [table N° 36](#))

Such comparison is noted in graphic Y8. In relative terms, the higher the respective connection speed the higher the decrease, to the point that for the case of a 4,096/768 Kbps connection speed the reduction reached 79 %.

Prices paid television service reported to SITEL

Regarding the behavior of prices for telecommunications services, the information provided by different operators of paid television services about prices indicate that the

maximum, minimum and average prices offered in the basic service packages⁹, corresponding to the period 2014-2017. To this point, need to highlight a convergence in the prices to the extent that, while the minimum price experienced an increase in 2017 with regards to the figures of the two previous years, the maximum price got a reduction of 22,500 to 19,500 Colones. As a result of this behavior of prices, the resulting average is very similar to the average registered in past years. Even though the average got a 7.5 % reduction in 2017, the decrease from 2014 to 2017 is just a 1.1 %. This is explained in detailed in [table N° 37](#) and [table N° 127](#).

Average prices for fixed Internet associated to most of the speeds show a reduction since 2015.

Mobile Telecommunications Price Index

At a global level, the telecommunications market is characterized by being highly dynamic, from the point of view of both, the supply (promotions, packages and others) and the demand (consumer likes and preferences), and Costa Rica is not the exception.

The year 2017 marked a milestone in the Costa Rican telecommunications market. In September, the mobile telephony retail service was declared as a market under competitive conditions. This means voice, messaging and mobile data prices are no longer set by this Superintendence, but are established in accordance with supply and demand.

Due to the above, SUTEL assumed the commitment to monitor the market behavior of the prices of this service, so that, in the face of an atypical and sustained trend that affects the operators or users, the necessary inputs should be available to carry out the relevant analyzes and take regulatory actions to ensure the sustainability of the market.

This Superintendence designed, for this purpose, a Price Index for the Mobile Telecommunications

⁹ Understood as the basic package that includes 75 analog channels.



Market¹⁰ (PIMTM), with the support of international institutions such as the National Institute of Statistics and Geography of Mexico, the Central Bank of Costa Rica and the National Institute of Statistics and Census.

In this sense, the Index aims to have a tool that provides inputs for the analysis and definition of regulatory actions, to monitor the trend of prices of services purchased by mobile telecommunications users.

Results to December 2017

The baseline for this index is July of 2017, as the required information from the service providers was available; in addition, it is a key month because it was before the declaration of the market in competition, and there was the possibility to measure the behavior of prices after this event.

significant changes (increase of 0.48 %). However, in the case of mobile data, at the end of the last quarter, there was a decrease of 3.35 %. The detail can be seen on [graphs N° 128 and N° 129](#).

Postpaid Mobile Telecommunications Price Index

During the fourth quarter of 2017, the prices corresponding to the postpaid mobile telephony category decreased by 5.2 %, with a downward trend. Likewise, in the case of service components, the voice category shows a decrease of 2.74 % compared to July 2017, while SMS show an increase of only 0.79 %, and data shows a decrease of 7 %. The detail can be seen on [graphs N° 130 and N° 131](#).

Prepaid Mobile Telecommunications Price Index

In the case of the prepaid mobile telephony category, there was a decrease of 3.4 %, from July 2017 to December of that year. Regarding the components, the voice category presented a downward trend, and closed with a 1.6 % decrease by the end of this year. In the case of SMS, the variations consist of slight decreases, and for mobile data it shows a reduction of 0.04 %, which indicates that prices have remained practically constant in this analyzed period. The detail can be seen on [graphs N° 132 and N° 133](#).

Comparing IPTM as of December with the one in July 2017, there is a 4.32 % decrease in prices. The decrease has been higher for the post-paid modality (5.2 %) than for pre-paid (3.4 %).

National Index of Mobile Telecommunications Prices

In general terms, the average price of mobile telecommunications at national level shows a decrease of 4.32 % for the closing of 2017 with respect to July of that same year. It is evident that the mobile market has presented greater dynamism in the commercial supply and adjustments to the prices prevailing during the last semester.

At the component level, the voice has shown a downward trend and, at the end of 2017, the decrease was 2.07 % with respect to July 2017. In the case of SMS, the behavior is practically constant, without showing

¹⁰ Refer to the Methodological Summary in the Methodology section..

Table N° 20
Costa Rica. Distribution of number of mobile telephony offers
received through 'Mi Comparador' platform, by operator
September 2016-December 2017

| Operator or mobile telephony supplier | Offers received |
|---------------------------------------|-----------------|
| Claro | 1,155 |
| Fullmóvil | 35 |
| ICE | 933 |
| Movistar | 499 |
| Tuyomóvil | 30 |
| TOTAL | 2,652 |

Source: Sutel, General Directorate for Market.

Table N° 21
Costa Rica: Evaluation of prices for 4G@3 Plan without terminal

| Valoration unit | Unit price (colones)* | Offer availability | Components cost (colones) |
|-------------------------|-----------------------|--------------------|---------------------------|
| Minutes | 34 | 250 | 8,500 |
| Mensajes | 3 | 250 | 750 |
| Gigabytes** | 9,018 | 4 | 36,071 |
| Plan cost | | | 20,900 |
| Messages and calls cost | | | 9,250 |
| Data download available | | | 11,650 |
| Gigabyte download cost | | | 2,913 |

*Prices include sales tax.

** Gigabyte price determined by maximum authorized price: 0,0086 Colones per kilobyte.

Source: Sutel, General Directorate for Market.

Table N° 22
Costa Rica. Evaluation of prices of 'Plan Sin Límite 3' (pure)

| Valoration unit | Unit price (colones)* | Offer availability | Components cost (colones) |
|-------------------------|-----------------------|--------------------|---------------------------|
| Minutes | 34 | 300 | 10,200 |
| Mensajes | 3 | 300 | 900 |
| Gigabytes** | 9,018 | 4 | 36,071 |
| Plan cost | | | 18,500 |
| Messages and calls cost | | | 11,100 |
| Data download available | | | 7,400 |
| Gigabyte download cost | | | 1,850 |

* Prices include sales tax.

** Gigabyte price determined by maximum authorized price: 0,0086 Colones per kilobyte.

Source: Sutel, General Directorate for Market.



Table N° 23
Costa Rica. Evaluation of prices of 'Plan Sin Límite 3' with terminal

| Valoration unit | Unit price (colones)* | Offer availability | Components cost (colones) |
|-------------------------|-----------------------|--------------------|---------------------------|
| Minutes | 34 | 250 | 8,500 |
| Mensajes | 3 | 250 | 750 |
| Gigabytes** | 9,018 | 8 | 72,142 |
| Plan cost | | | 24,000 |
| Messages and calls cost | | | 9,250 |
| Data download available | | | 14,750 |
| Gigabyte download cost | | | 1,844 |

* Prices include sales tax.

** Gigabyte price determined by maximum authorized price: 0,0086 Colones per kilobyte.

Source: Sutel, General Directorate for Market.

Table N° 24
Costa Rica. Evaluation of prices of Plan Postpago Masivo Sin Límite 4

| Valoration unit | Unit price (colones)* | Offer availability | Components cost (colones) |
|-------------------------|-----------------------|--------------------|---------------------------|
| Minutes | 34 | 600 | 20,400 |
| Mensajes | 3 | 600 | 1,800 |
| Gigabytes** | 9,018 | 8 | 72,142 |
| Plan cost | | | 34,900 |
| Messages and calls cost | | | 22,200 |
| Data download available | | | 12,700 |
| Gigabyte download cost | | | 3,175 |

* Prices include sales tax.

** Gigabyte price determined by maximum authorized price: 0,0086 Colones per kilobyte.

Source: Sutel, General Directorate for Market.

Table N° 25
Costa Rica. Evaluation of prices of Plan Sin Límite 3 (pure)

| Valoration unit | Unit price (colones)* | Offer availability | Components cost (colones) |
|-------------------------|-----------------------|--------------------|---------------------------|
| Minutes | 34 | 300 | 10,200 |
| Mensajes | 3 | 300 | 900 |
| Gigabytes** | 9,018 | 8 | 72,142 |
| Plan cost | | | 24,500 |
| Messages and calls cost | | | 11,100 |
| Data download available | | | 13,400 |
| Gigabyte download cost | | | 1,675 |

* Prices include sales tax

** Gigabyte price determined by maximum authorized price: 0,0086 Colones per kilobyte

Source: Sutel, General Directorate for Market.

Table N° 26
Costa Rica. Evaluation of prices of Plan 4G k3

| Valoration unit | Unit price (colones)* | Offer availability | Components cost (colones) |
|-------------------------|-----------------------|--------------------|---------------------------|
| Minutes | 34 | 300 | 10,200 |
| Mensajes | 3 | 300 | 900 |
| Gigabytes** | 9,018 | 5 | 45,089 |
| Plan cost | | | 18,000 |
| Messages and calls cost | | | 11,100 |
| Data download available | | | 6,900 |
| Gigabyte download cost | | | 1,380 |

* Prices include sales tax.

** Gigabyte price determined by maximum authorized price: 0,0086 Colones per kilobyte.

Source: Sutel, General Directorate for Market.

Table N° 27
Costa Rica. Evaluation of prices of Plan 4G k4

| Valoration unit | Unit price (colones)* | Offer availability | Components cost (colones) |
|-------------------------|-----------------------|--------------------|---------------------------|
| Minutes | 34 | 800 | 27,200 |
| Mensajes | 3 | 600 | 1,800 |
| Gigabytes** | 9,018 | 7 | 63,124 |
| Plan cost | | | 26,000 |
| Messages and calls cost | | | 29,000 |
| Data download available | | | --- |
| Gigabyte download cost | | | --- |

* Prices include sales tax.

** Gigabyte price determined by maximum authorized price: 0,0086 Colones per kilobyte.

Source: Sutel, General Directorate for Market.

Table N° 28
Costa Rica. Price of fixed internet service by operator and selected
month, level of over subscription 1:20, year 2017
(data in Colones)

| Date | Operator | Plan name or package | Subscription or installation charges | Monthly plan fee or sales tax included package (colones) | Download speed |
|------------|------------|----------------------|--------------------------------------|--|----------------|
| 01/01/2017 | Telecable | - | | 18,500 | 8 Mb |
| 01/12/2017 | Telecable | | | 19,250 | 8 Mb |
| 01/01/2017 | COOPELESCA | 8Mb/1Mb | - | 19,925 | 8 Mb |
| 01/07/2017 | COOPELESCA | 8Mb/2Mb | - | 19,925 | 8 Mb |
| 01/12/2017 | COOPELESCA | 8Mb/2Mb Individual | - | 19,925 | 8 Mb |
| 01/02/2017 | ESPH-IBUX | Ibux 8 | | 33,561 | 8 Mb |
| 01/12/2017 | ESPH-IBUX | Ibux 8 | | 33,561 | 8 Mb |
| 02/02/2017 | Tigo | Internet 8 Mbps | N/A | 18,500 | 8 Mb |
| 01/12/2017 | Tigo | Internet 8 Mbps | N/A | 17,910 | 8 Mb |
| 01/07/2017 | Cabletica | Mega Internet 8Mbps | 105,000 | 20,694 | 8 Mb |
| 01/12/2017 | Cabletica | Mega Internet 8Mbps | 105,000 | 19,950 | 8 Mb |

Source. Sutel, General Directorate for Market.



Table N° 29
Costa Rica. Fixed telephony packaging prices by supplier and months
selected, level of over subscription 1:20, year 2017
 (data in Colones)

| Date | Operator | Plan name or package | Services | Zone / Region | Suscription or installation charges | Monthly plan fee or sales tax included package | Download speed |
|------------|-----------|------------------------------------|-----------------------|-------------------------------|-------------------------------------|--|----------------|
| 01/01/2017 | Telecable | TV+@ | Televisión, Internet | Todas las zonas con cobertura | - | 28,500 | 8 Mb |
| 01/12/2017 | Telecable | TV+@ | TV, Internet | Todas las zonas con cobertura | - | 29,500 | 8 Mb |
| 01/02/2017 | kölbi | kolbi hogar internet + Tv Avanzada | Internet + televisión | Todo el país | | 35,800 | 6 Mb |
| 01/12/2017 | kölbi | kolbi hogar internet + Tv Avanzada | Internet, TV | Todo el país | | 35,800 | 6 Mb |
| 01/07/2017 | Cabletica | Super Pack Doble Play + Digital | CATV + @ + TV Digital | Total país | 105,000 | 30,250 | 8 Mb |
| 01/12/2017 | Cabletica | Triple Play | CATV + @ + VoIP | Total país | 105,000 | 29,990 | 8 Mb |
| 01/10/2017 | Tigo | TV Digital e Internet | DIGITAL BASICO + 8 MB | | | 26,500 | 8 Mb |
| 01/12/2017 | Tigo | TV Digital e Internet | DIGITAL BASICO + 8 MB | | | 26,500 | 8 Mb |

Source. Sutel, General Directorate for Market.



Table N° 30
Costa Rica. Access to fixed asymmetric internet service prices, level of
over subscription 1:20, 2017
(Data in Colones per month)

| Download speed / upload speed (Kbps) | Maximum price | Minimum price | Average price |
|--------------------------------------|---------------|---------------|---------------|
| 512/256 | 13,500 | 5,500 | 8,667 |
| 1024/512 | 36,343 | 5,221 | 12,398 |
| 2048/768 | 28,150 | 7,500 | 13,088 |
| 3072/768 | 32,071 | 10,000 | 16,646 |
| 4096/768 | 33,699 | 9,315 | 18,350 |
| 5120/1024 | 41,711 | 11,926 | 19,013 |
| 6144/1024 | 35,708 | 16,000 | 22,101 |

Source: Sutel, General Directorate for Market.

Table N° 31
Costa Rica. Access to fixed asymmetric internet service prices, level of over
subscription 1:20, 2014-2017
(Colones per month)

| Speed (kbps) | 2014 | 2015 | 2016 | 2017 |
|--------------|--------|--------|--------|--------|
| 256/128 | 7,233 | 6,902 | 8,576 | |
| 512/256 | 7,690 | 7,444 | 6,855 | 8,667 |
| 1024/512 | 8,663 | 9,019 | 9,331 | 12,398 |
| 2048/768 | 14,924 | 14,806 | 11,858 | 13,088 |
| 3072/768 | 16,536 | 15,645 | 16,030 | 16,646 |
| 4096/768 | 26,713 | 24,040 | 17,336 | 18,350 |
| 5120/1024 | 27,748 | 25,848 | 16,711 | 19,013 |

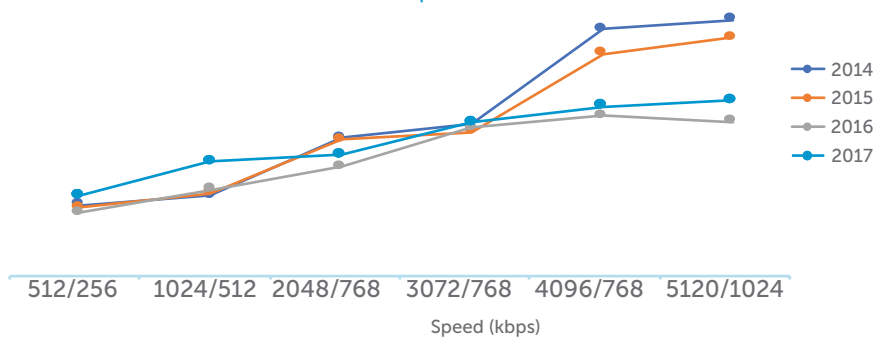
Source: Sutel, General Directorate for Market.

Graph N° 123
Costa Rica. Access to fixed asymmetric internet service prices, level of
over subscription 1:20, 2014-2017
(Colones per month)

A greater number of
asymmetric Internet services,
with oversubscription 1:20 has
implied a prices

reduction

for speeds services over 3
Mbps, since 2016.



Source: Sutel, General Directorate for Market.

Table N° 32
Costa Rica. Access to fixed asymmetric internet service prices, level of
over subscription 1:5, 2017
 (Colones per month)

| Download speed / upload speed (Kbps) | Maximum price | Minimum price | Average price |
|---|---------------|---------------|---------------|
| 512-256 | 33,685 | 33,685 | 33,685 |
| 1024/512 | 44,908 | 26,303 | 35,016 |
| 2048/768 | 39,256 | 28,263 | 34,961 |
| 4096/1024 | 71,751 | 32,973 | 55,304 |
| 5120/1024 | 112,500 | 52,250 | 76,060 |
| 6144/1024 | 128,538 | 61,558 | 95,066 |
| 8192/1024 | 162,250 | 70,076 | 105,197 |
| 10240/1024 | 195,474 | 83,984 | 137,160 |

Source: Sutel, General Directorate for Market.

Table N° 33
Costa Rica. Access to fixed asymmetric internet service prices, level of
over subscription 1:5, 2014-2017
 (Colones per month)

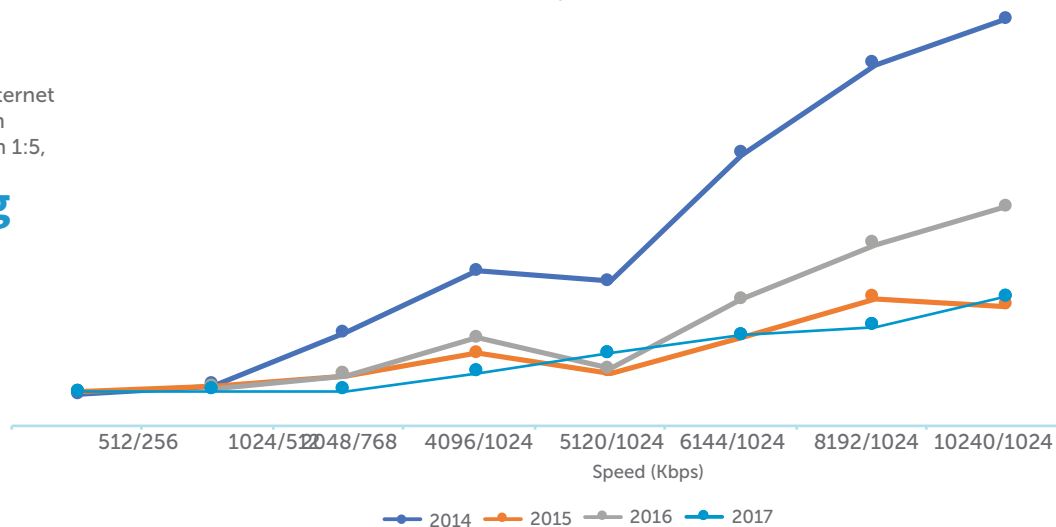
| Download speed / upload speed (Kbps) | Price 2014 | Price 2015 | Price 2016 | Price 2017 |
|---|------------|------------|------------|------------|
| 512/256 | 31,762 | 33,782 | | 33,685 |
| 1024/512 | 40,651 | 39,199 | 39,031 | 35,016 |
| 2048/768 | 98,833 | 51,992 | 52,588 | 34,961 |
| 4096/1024 | 165,264 | 75,430 | 92,834 | 55,304 |
| 5120/1024 | 153,426 | 54,487 | 59,859 | 76,060 |
| 6144/1024 | 291,605 | 94,213 | 133,889 | 95,066 |
| 8192/1024 | 388,805 | 135,506 | 194,100 | 105,197 |
| 10240/1024 | 437,416 | 127,251 | 234,521 | 137,160 |

Source: Sutel, General Directorate for Market.



Table N° 124
Costa Rica. Precios del servicio de acceso a Internet asimétrico, nivel
sobresuscripción 1:5, 2014-2017
(Colones per month)

Prices of fixed Internet
service, with
oversubscription 1:5,
shows a
falling
tendency.



Source: Sutel, General Directorate for Market.

Table N° 34
Costa Rica. Access to fixed symmetric internet service prices, level of over
subscription 1:5, 2017
(colones per month)

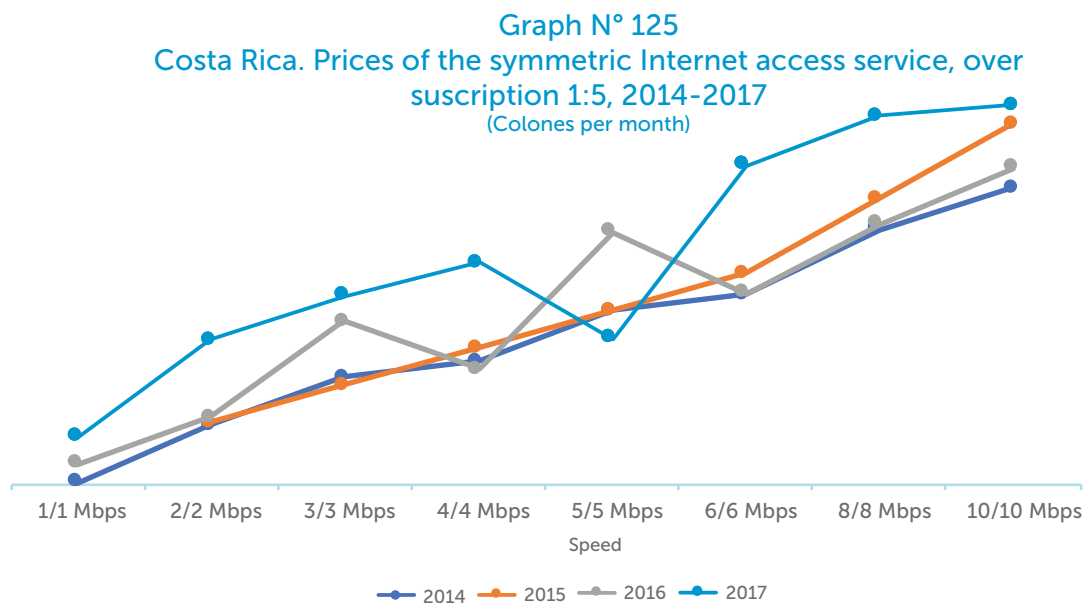
| Download speed / upload speed (Kbps) | Maximum price | Minimum price | Average price |
|---|---------------|---------------|---------------|
| 512/256 | 84,644 | 78,936 | 81,790 |
| 1/1 Mbps | 140,680 | 94,096 | 116,535 |
| 2/2 Mbps | 377,520 | 100,241 | 221,994 |
| 3/3 Mbps | 502,800 | 164,614 | 270,120 |
| 4/4 Mbps | 330,483 | 282,360 | 306,363 |
| 5/5 Mbps | 258,201 | 187,423 | 224,713 |
| 6/6 Mbps | 644,750 | 205,515 | 412,719 |
| 8/8 Mbps | 792,463 | 233,436 | 465,583 |
| 10/10 Mbps | 759,652 | 252,647 | 477,659 |

Source: Sutel, General Directorate for Market.

Table N° 35
Costa Rica. Access to fixed symmetric internet service prices, level of over
subscription 1:5, 2014-2017
(colones per month)

| Download speed / upload speed (Kbps) | Price 2014 | Price 2015 | Price 2016 | Price 2017 |
|---|------------|------------|------------|------------|
| 1/1 Mbps | 67,500 | | 88,651 | 116,535 |
| 2/2 Mbps | 130,266 | 132,300 | 138,736 | 221,994 |
| 3/3 Mbps | 181,471 | 172,800 | 243,000 | 270,120 |
| 4/4 Mbps | 199,620 | 213,300 | 191,356 | 306,363 |
| 5/5 Mbps | 254,559 | 253,800 | 340,200 | 224,713 |
| 6/6 Mbps | 272,435 | 294,300 | 273,925 | 412,719 |
| 8/8 Mbps | 341,982 | 375,300 | 348,001 | 465,583 |
| 10/10 Mbps | 387,179 | 456,300 | 409,728 | 477,659 |

Source: Sutel, General Directorate for Market.



Source: Sutel, General Directorate for Market.

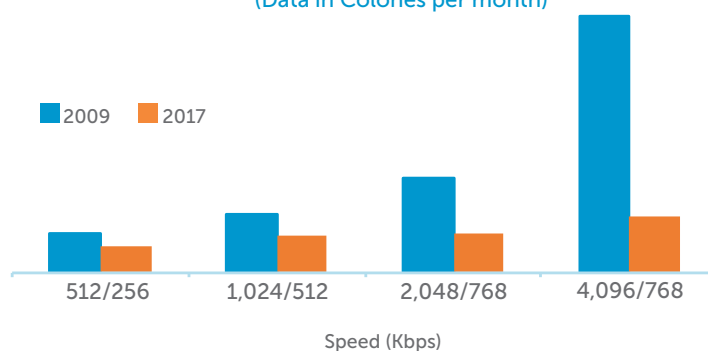


Table N° 36
Costa Rica. Comparative of prices for the fixed internet service access
2009 vs. 2017
Level of over subscription 1:20
(Data in Colones per month)

| Download speed / upload speed (Kbps) | Maximum rate 2009* | Average price 2017 | Annual variance (%) |
|---|--------------------|--------------------|---------------------|
| 512/256 | 12,663 | 8,667 | -32 % |
| 1024/512 | 19,248 | 12,398 | -36 % |
| 2048/768 | 31,405 | 13,088 | -58 % |
| 4096/768** | 85,605 | 18,350 | -79 % |

Source: Sutel, General Directorate for Market.

Graph N° 126
Costa Rica. Comparative of prices for the fixed internet service access
2009 vs. 2017
Level of over subscription 1:20
(Data in Colones per month)



Source: Sutel, General Directorate for Market.

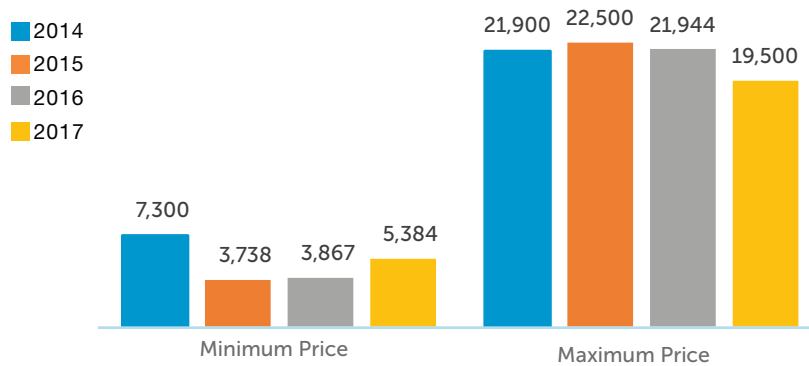


Table N° 37
Costa Rica. Basic subscription television package service prices,
2014-2017
(Data in colones)

| Price | 2014 | 2015 | 2016 | 2017 | Variation 2014-2015 | Variation 2015-2016 | Variation 2016-2017 |
|----------|--------|--------|--------|--------|------------------------|------------------------|------------------------|
| Máxima | 21,900 | 22,500 | 21,944 | 19,500 | 2.7 % | -2.5 % | -11.1 % |
| Mínima | 7,300 | 3,738 | 3,867 | 5,384 | -48.8 % | 3.4 % | 39.2 % |
| Promedio | 12,803 | 12,290 | 13,683 | 12,657 | -4.0 % | 11.3 % | -7.5 % |

Source: Sutel, General Directorate for Market.

Table N° 127
Costa Rica. Maximum and minimum prices for the basic subscription
television package, 2014-2017
(Colones per month)



Basic paid TV package
prices show stability. It
has reduced

1.1 %

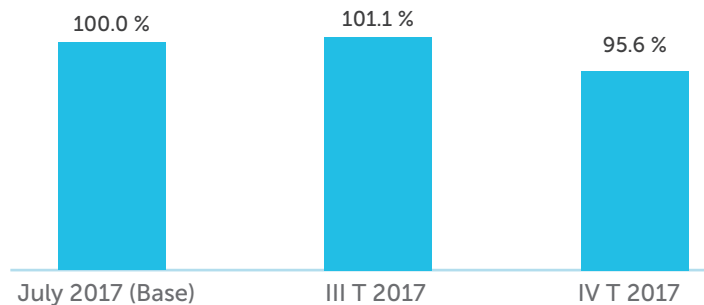
from 2014 to 2017.

Source: Sutel, General Directorate for Market.



Graph N° 128

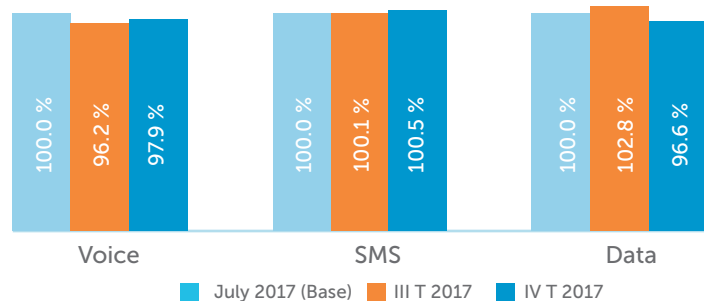
Costa Rica: Evolution of the National Price Index of Mobile Telecommunications, July 2017(base), III T 2017 and IV T 2017
(Figures in Percentage)



Source: SUTEL, General Directorate for Markets.

Graph N° 129

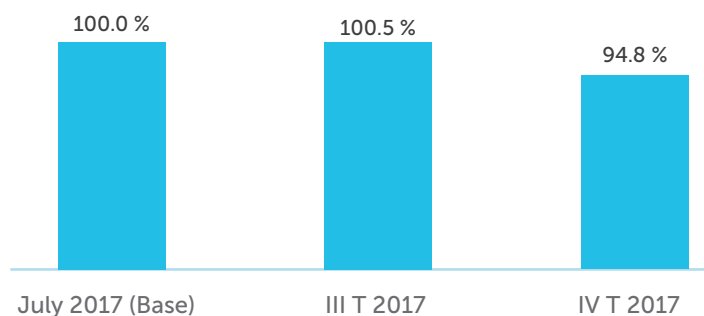
Costa Rica: Evolution of the National Price Index of Mobile Telecommunications per component, July 2017(base), III T 2017 and IV T 2017
(Figures in Percentage)



Source: SUTEL, General Directorate for Markets.

Graph N° 130

Costa Rica: Evolution of the National Price Index of Postpaid Mobile Telecommunications, July 2017(Base), III T 2017 and IV T 2017
(Figures in Percentage)

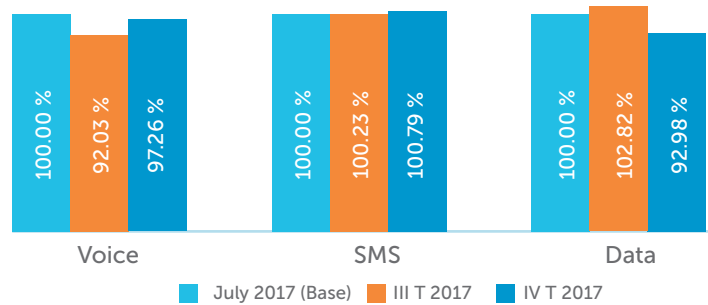


Source: SUTEL, General Directorate for Markets.



Graph N° 131

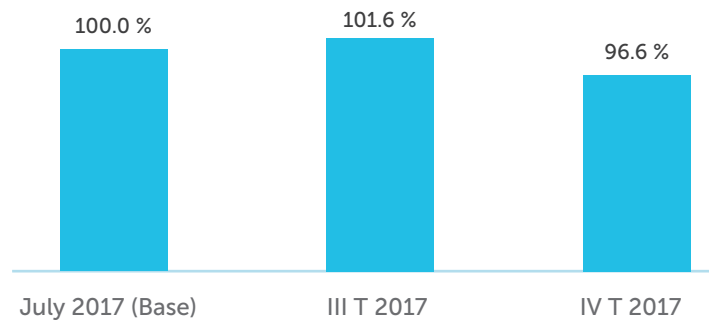
Costa Rica: Evolution of the National Price Index of Postpaid Mobile Telecommunications, per component, July 2017(base), III T 2017 and IV T 2017
(Figures in Percentage)



Source: SUTEL, General Directorate for Markets.

Graph N° 132

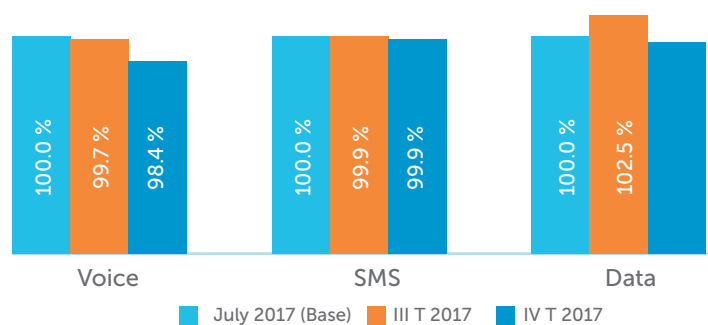
Costa Rica: Evolution of the National Price Index of Prepaid Telecommunications, July 2017(Base), III T 2017 and IV T 2017
(Figures in percentage)



Source: SUTEL, General Directorate for Markets.

Graph N° 133

Costa Rica: Evolution of the National Price Index of Prepaid Mobile Telecommunications per component. July 2017(Base), III T 2017 and IV T 2017
(Figures in Percentage)



Source: SUTEL, General Directorate for Markets.



NETWORK QUALITY AND PERFORMANCE





NETWORK QUALITY AND PERFORMANCE

Between the 2015 and 2017 periods, there was an increase of 6.2 % in the number of districts covered by 2G networks; an addition of 3.9 % in the number of districts covered by 3G networks; and an increase of 13.3 % in the number of districts covered by 4G networks.



This chapter describes the results of the annual technical evaluations of quality of service carried out by SUTEL during 2017, and presents the comparison of the data collected in the field, using specialized measurement equipment, against the established threshold (minimum quality values)¹. SUTEL conducts national drive testing measurements for mobile telephony and mobile Internet service, in areas delimited by the coverage maps and coverage data published by the operators on their websites.

The results of the quality perception and degree of satisfaction surveys of fixed telephony, VoIP telephony, mobile telephony, mobile Internet, fixed internet and pay television services are also presented in this chapter.

In addition, the results generated from the data obtained of the collaborative tool of OpenSignal, a company specialized in measuring the performance of mobile networks, for 2017 are also included. This collaborative tool is installed on end user phones. These results are informative.

The following section presents the detail of the results obtained for each one of these reports.

Drive-test Quality Measurements for Mobile Networks

As part of the continuous process of national evaluation of the quality of service of the 2G, 3G and 4G mobile networks of ICE, Claro and Telefónica, SUTEL carried out drive-test measurements in the period between February 6 and November 28, 2017. The measurement schedule was between 8:00 am and 7:00 pm in towns, and between 6:00 am and 10:00 pm on highways.

The evaluations carried out by SUTEL are done with specialized drive-test benchmarking equipment in towns and highways, jointly and simultaneously analyzing the quality conditions offered by the three mobile network operators for both mobile telephony and the mobile Internet. These measurements are carried out in accordance with the methodologies established on the “Procedure for the Evaluation of Quality Parameters of the Mobile Telephony Service

¹ In accordance with the Reglamento de prestación y calidad de servicio published in La Gaceta N° 82 of the 29 april 2009.



in Drive-test Type Field Tests” and the “Procedure for Measuring the Performance of the Service of Data Transfer in Mobile Networks, commercially known as Mobile Internet”. These documents were elaborated by this Superintendence, and were approved and published by the Board through resolutions RCS-260-2012 and RCS-061-2014, respectively. This information is presented in greater detail in the Methodology and Description of Services chapter.

The measurement involved a total of 47,195 km, in 471 districts, and allowed the compilation 23 million average data samples per operator.

The processing and analysis of the data, allow SUTEL to obtain results per operator for the following quality parameters: voice calls completion percentage (article 59 of the RPCS in force during the evaluation date); call setup time (article 62 of the RPCS in force during the evaluation date); mobile service coverage areas (article 63 of the RPCS in force during the evaluation date); voice quality in mobile services (article 65 of the RPCS in force during the evaluation date) and compliance of the performance of the local and international transfer speed in relation with the speed contracted (provisioned) (article 98 of the RPCS in force during the evaluation date)².

• Level of Compliance of Quality Parameters in the National Territory for Voice Services (2G and 3G Networks)

In this section, the results of the evaluation of the perceptible parameters³ by the end users, call completion⁴ and coverage area (coverage accuracy) are shown.

- Calls Completion

From the analysis of the results shown on the [graph N° 134](#), for the 2G network for 2017, Claro recorded a 98 % call completion percentage, Telefónica 97 % and ICE 81 %.

Regarding the 3G network, on the [graph N° 135](#), for the year 2017, Claro recorded a 98 % call completion percentage, Telefónica 97 % and ICE 86 %.

It is possible to conclude that Claro and Telefónica record an increasing trend for the call completion parameter of both 2G and 3G networks, as shown on the [graph N° 134](#) and [graph N° 135](#). Likewise, the results obtained exceed the minimum quality threshold established in the RPCS in force during the evaluation date, which corresponded to 70 % for the year 2017.

- Coverage area (coverage accuracy)

The evaluation of this parameter included the analysis of the four types of coverage, in accordance with the

The results obtained regarding mobile call completion indicate that the minimum threshold of quality set by current Regulations is exceeded.

respective covered maps of the operators and published on their websites, namely: within buildings, inside vehicles, outside only, and outside the area of coverage.

To estimate the compliance of coverage area, SUTEL needed the coverage maps provided by the operators Claro and Telefónica for November 2017. Regarding the coverage map of the operator ICE, it was built from the data collected by this operator through drive-test measurements also conducted in 2017.

A filtering procedure was carried out using a Geographical Information System tool (by its acronym in english GIS), owned by SUTEL. This procedure consists of correlating the intensity level of the signal obtained in the field, with the coverage maps delivered by the operators and published on their respective websites⁵.

For the 2G networks, in accordance with the data shown on the [graph N° 134](#) for 2017, Telefónica recorded a

² This quality parameter was evaluated nationally with “drive test” measurements according to the procedure provided in resolution RCS-061-2014 “Procedure for Measuring the Performance of the Data Transfer Service in Mobile Networks, Commercially Known as Mobile Internet”, for the first time in the second semester of 2014.

³ In accordance with the Reglamento de prestación y calidad de servicio published in La Gaceta N° 82 of 29th april 2009.

⁴ This parameter consists of the possibility for the end users to establish and maintain a telephone call.



coverage area percentage (coverage accuracy) of 95 %, ICE 93 %, and Claro 91 %.

From the analysis of the results of the graph N° 135 for the 3G networks for 2017, Telefónica recorded a coverage area percentage (coverage accuracy) of 93 %; Claro 80 %; and ICE 78 %.

It is possible to conclude that the operators ICE and Claro didn't reach the regulatory threshold of 95 % for the coverage area parameter for the 2G network. Likewise, the operators ICE, Claro and Telefonica didn't reach the regulatory threshold of 95 % for the coverage area parameter for the 3G network.

• Average Download Speed (Measured vs. Provisioned-Contracted)

The evaluation of the performance parameter of the transfer speed measured compared against the contracted (provisioned) speed, was done based on the application of the "Procedure for Measuring the Performance of the Data Transfer Service in Mobile Networks Commercially known as Mobile Internet"⁶. The measurements were carried on route along highways, collecting samples of instant download speed.

The calculating process of this parameter required the instant download speed samples collected within the coverage maps of each operators, specially within the two types of coverage (within buildings and inside vehicles)⁷. For greater detail consult the Methodology and Description of Services chapter .

The results shown on the graph N° 136 and [graph N° 137](#) displays the average performance of the download speed, measured compared against the download speed contracted (provisioned), for the 3G and 4G networks of ICE, Claro and Telefónica operators.

The graph N° 136 shows the results obtained at a national level for the 3G network of these three operators. Telefónica recorded a percentage of download speed performance of 70 % (an increase of 5 % with respect to 2016). Claro, recorded a percentage of download speed performance of 63 % (a 3 % increase

with respect to 2016), and ICE recorded a percentage of download speed performance of 52 % (an increase of 13 % with respect to 2016).

From the [graph N° 137](#) analysis, which shows the results by province for ICE, it is possible to point out that the extreme results of the performance of download speed are Guanacaste, with 59 %, and Heredia with 38 %.

In [graph N° 138](#), the extreme results for Claro of the performance of download speed are Guanacaste and Puntarenas with 70 % and Cartago with 53 %.

Regarding Telefónica, as it can be seen on [graph N° 139](#), the extreme results of performance of download speed are Guanacaste with 74 %, and Limón with 56 %.

The [graph N° 140](#) chart shows the results obtained at national level for the 4G network⁸. This parameter is estimated comparing the measure speed on field and the speed contracted, this last one according to the information provided by the operators. The current data are: ICE 75 %, Telefónica 72 %, and Claro 31 %.

The [graph N° 141](#) shows the results per province for the operator ICE, whose extreme results are Limón with 92 %, and Heredia with 46 %.

For Claro, [graph N° 142](#) chart shows the results per province, and the extreme results are Puntarenas with 53 % and San José with 25 %.

[Graph N° 143](#) shows the data obtained for Telefónica, and the extreme results are Cartago with 78 %, and Limón with 46 %.

Graphs [N° 137](#), [N° 138](#), [N° 139](#) details the contracted speed, the measured speed and the performance achieved for the 3G network during the measurements done in 2017. For ICE, the average speed obtained was 1.6 Mbps, compared against the contracted speed of 3 Mbps. For Claro, the average speed obtained was 3.2 Mbps, compared against the contracted speed of 5 Mbps, and for Telefónica, the average speed obtained was 2.9 Mbps, compared against the contracted speed of 4 Mbps.

⁶ In accordance with RCS-061-2014.

⁷ It is important to mention that outdoor coverage is excluded since this level of signal does not allow the correct operation of the Mobile Internet Service.

⁸ The 4G networks are under deployment and expansion process.



Likewise, graphs N° 141, N° 142, N° 143 specify the contracted speed, the measured speed and the performance achieved for the 4G network during the measurements done in 2017. For ICE, the average speed obtained was 4.6 Mbps, compared against the contracted speed of 6 Mbps. For Claro, the average speed obtained was 9.6 Mbps, compared against the contracted speed of 30 Mbps, and for Telefónica, the average speed obtained was 8.8 Mbps, compared against the contracted speed of 12 Mbps.

It is possible to conclude that, for the 3G network, ICE, Claro and Telefónica show an increasing trend for the parameter of the download speed performance, when comparing data from 2016 and 2017. Likewise, for the 4G network, the three operators show a decreasing trend.

Quality Perception

In the following sections, the complementary results of the technical measurements are presented, in this case the results of the quality perception and degree of satisfaction surveys and the OpenSignal tool data, as described below:

- Quality perception and degree of satisfaction surveys of the fixed telephony, mobile telephony, mobile and fixed Internet access and pay television services, which, in accordance with the definition of quality of service as recommended by “ITU-T E. 800 Definitions of terms related to quality of service”, includes the assessment of the satisfaction of the needs of the end user, and imply a subjective component that is parameterized to obtain a final note of perception and degree of satisfaction.
- The user experience quality reports generated from data obtain from the OpenSignal tool, and acquired by SUTEL, which presents the quality experienced by those users who voluntarily decide to install the application and, therefore, the results obtained depend on the characteristics of the plans subscribed by these users.

• Quality Perception and Degree of Satisfaction

This section shows the results of the surveys applied during 2017, as well as the results obtained in 2015 and 2016, for fixed telephony (traditional basic and VoIP),

mobile telephony, fixed and mobile Internet access, as well as pay television services. The methodology applied is described in the chapter “Methodology and Description of Services”, this methodology takes into account the perception of the end user, which implies a subjective component of the degree of satisfaction that the service represents to the surveyed user. Is important to mention that the results are normalize to a score base on 10.

It is also important to note that the comparison of the results of different years is supported on the technical premise that the samples acquired maintain the same level of confidence and margin of error, that the same instrument is been applied, and the end users are randomly selected.

The sample size evaluated per operator corresponds to 600 users, which are obtained from the numerical data bases provided by the operators, applying a margin of error of 4 % and a level of confidence of 95 %.

The data shown in this section corresponds to the consolidated detail of the questions applied for each evaluated aspect in the survey. SUTEL will make a publication with the disaggregated information for greater detail.

The evaluated aspects for the services, in accordance with the previous Reglamento de prestación y calidad de servicios that was in effect until February 16, 2018, are:

- Personalized attention
- Telephone attention
- Service delivery
- Failure repair
- Billing service
- Service operation

• Fixed telephony

For the fixed telephony service, the operators CallMyWay, ICE, Telecable, Tigo and Cabletica are included in the analysis. The [graph N° 144](#) shows the results of quality perception and degree of satisfaction for 2017, in which CallMyWay obtained 8.9 points; ICE and Telecable, 8.4



points respectively; Tigo 8.1 points; and Cabletica, 7.9 points.

The [N° 145 graph](#) shows the data per evaluated aspect per operator for the years 2015, 2016 and 2017. In 2017, as extreme results, CallMyWay obtained, for service delivery and billing service, 9.4 points, and 8.4 points for failure repair. For ICE, the extreme results are billing service with 9.4 points, and telephone attention with 7.5 points. For Telecable, the extreme results are personalized attention, with 9.1 points, and failure repair, with 7.6 points. For Tigo, the extreme results are billing service with 9.3 points, and failure repair with 7.0 points. For Cabletica, the extreme results are billing service with 8.9 points, and telephone attention with 7.1 points.

results are service delivery and billing service with 9.1 points respectively, and failure repair with 7.3 points. For Fullmóvil, the extreme results are service operation with 8.6 points, and failure repair with 7.4 points.

It is possible to conclude, from [graph N° 147](#), that the evaluated aspect identified as the lower for the mobile telephony is failure repair.

• Data transfer

The data transfer service includes the analysis of the fixed Internet service, as well as the mobile Internet service. It is important to point out that end users of all operators and providers offering the mobile Internet service, including virtual mobile operators, were surveyed.

The [graph N° 148](#) shows the quality perception and degree of satisfaction results for the fixed Internet service. The results for 2017 are Telecable, with 8.5 points; ICE, with 8.2 points; Cabletica, with 8.1 points; and Tigo with 8.0 points.

When analyzing the information per evaluated aspect per operator, as detail on the [N° 149 graph](#) for the year 2017, for Telecable, the extreme results are billing service with 9.2 points and telephone attention with 7.9 points. For ICE, the extreme results are billing service, with 9.0 points, and service operation and telephone attention with 7.5 points respectively. For Cabletica, the extreme results are billing service with 9.0 points, and telephone attention with 7.1 points. For Tigo, the extreme results are billing service with 9.1 points and service operation, telephone attention and failure repair, with 7.4 points respectively.

In relation to the mobile Internet service, the [graph N° 150](#) shows that in 2017, Telefónica recorded a level of quality perception and degree of satisfaction of 8.6 points, Claro and Fullmóvil recorded 8.2 points respectively, Tuyo Móvil recorded 8.1 points and ICE recorded 7.9 points.

The [graph N° 151](#) shows the results per evaluated aspect per operator in 2017. For Telefónica, the extreme results are billing service with 9.4 points and failure repair, with 8 points. For Claro, the extreme results are service delivery with 9.1 points, and failure repair with 6.7 points. For Fullmóvil, the extreme results are service delivery with 9.3 points and failure repair, with 7.5 points. For Tuyo Móvil, the extreme results are service delivery with 9.1 points and failure repair, with 7.5 points. For ICE, the extreme results are service delivery with 9.0 points, and failure repair with 6.7 points.

In the case of studies of quality perception for mobile telephony, the item that was evaluated in the lower endpoint of repairs.

It is possible to conclude, from graph N° 144, that Tigo registers an increasing trend in its perception score in 2015, 2016 and 2017.

• Mobile Telephony

It is important to point out that, for the quality perception and degree of satisfaction surveys, end users of all the operators and providers of the mobile telephony service were surveyed, including end user of the mobile virtual operators.

The results for 2017 are shown on the [graph N° 146](#), in which Telefónica obtained 8.8 points, Tuyo Móvil 8.6 points, Claro 8.4 points, ICE 8.3 points and Fullmóvil 8.0 points.

The [graph N° 147](#) shows the data per evaluated aspect per operator for the years 2015, 2016 and 2017. In 2017, as extreme results, Telefónica obtained 9.5 points for billing service and 8.0 points for failure repair. For Tuyo Móvil, the extreme results are service operation, with 8.9 points, and mobile recharge service with 8.3 points. For Claro, the extreme results are service delivery with 9.1 points, and failure repair with 7.2 points. For ICE, the extreme



It is possible to conclude, from graphs N° 148 and N° 150, that Tigo and Telefonica registers an increasing trend in its perception score during 2015, 2016 and 2017.

• Pay Television

For the pay television service, it can be seen on the [graph N° 152](#), for 2017, that Telecable records a quality perception and degree of satisfaction level of 8.9 points; Sky records 8.8 points; Claro recorded 8.5 points and both Tigo and Cabletica recorded 8.3 points respectively.

The [graph N° 153](#) shows the results per evaluated aspect per operator for the years 2015, 2016 and 2017. In 2017, as extreme results, Telecable register for service delivery 9.4 points, while telephone attention and failure repair recorded 8.2 points. For Sky, the extreme results are billing service, with 9.4 points, and telephone attention, with 8.1 points. For Claro, the extreme results are service delivery, with 9.2 points, and personalized attention with 8.2 points. For Cabletica, the extreme results are service delivery and billing service with 9.1 points, respectively, and telephone attention with 7.2 points. For Tigo, the extreme results are billing service with 9.2 points and telephone attention with 7.6 points.

It is possible to conclude, from [graph N° 152](#), that Tigo registers an increasing trend in its perception score since 2015 to 2017.

• User Experience Quality Reports

Since 2016, the SUTEL acquires reports of the quality of the service taking advantage of data collected through collaborative tools, which allow to evaluate the quality of the service from the perspective of the user's experience (QoSE; for its acronym in english).

These collaborative tools allow collecting data from the user's terminals, users that install the tool on a voluntary basis. These reports represent a complementary data source to the quality of service measurements done by SUTEL.

The reports are done by the company OpenSignal, and the measurements are taken independently of the place where the user is at a given moment -indoors or outdoors; in urban or rural areas; in towns or highways- and capture the performance of the network, as experienced by the end user.

The results of these reports are shown in the [graphs N° 154, N° 155 y N° 156](#), these results are obtained of an average of 7691 end users that have the tool OpenSignal install on their phones. The [graph N° 154](#) shows the results of download speed for the 3G network for ICE, Telefónica and Claro, for the periods corresponding to the I and II semester of 2016, and for the I and II semester of the year 2017. Telefónica records an average download speed of 2.25 Mbps; Claro records 1.9 Mbps, and ICE records an average download speed of 1.425 Mbps. As it can be seen, the download speeds of the 3G network have remained constant for two consecutive years.

On the [N° 155 graph](#), the download speed results for the 4G network are shown. It is important to note that, for Claro, samples are recorded from the I semester of 2017. Claro records an average download speed of 7.25 Mbps. ICE records an average download speed of 6.2 Mbps (an increase of 5.1 Mbps compared against the average download speed reported in the I semester of 2016). Telefónica records an average download speed of 5.98 Mbps.

The [N° 156 graph](#) contains the results corresponding to the availability of the 4G network, which means the percentage of time that the users of the operators stays connected to the 4G network. Telefónica records an average availability of the 4G network of 71.25 %, while ICE records 52 %, and Claro 42 %, on average. It is important to point out that the samples for Claro are registered as of the I semester of 2017.

Complains attended by SUTEL

In this section, is shown the statistics results of the complaints filed at SUTEL by the end users. It is important to clarify that the total of complaints filed at SUTEL doesn't represents the total amount of users of the telecommunication services per operator, they only represent the users that decide to escalate a complaint at SUTEL.

During 2017, SUTEL handled a total of 846 complaints for fixed telephony, mobile telephony, mobile Internet, fixed Internet and pay television services, with an increase of 14.17 %, compared against 2016 results, equivalent to 105 complaints.

Based on the results displayed on the [graph N° 157](#), it is possible to calculate that Claro and ICE accumulate 65 %



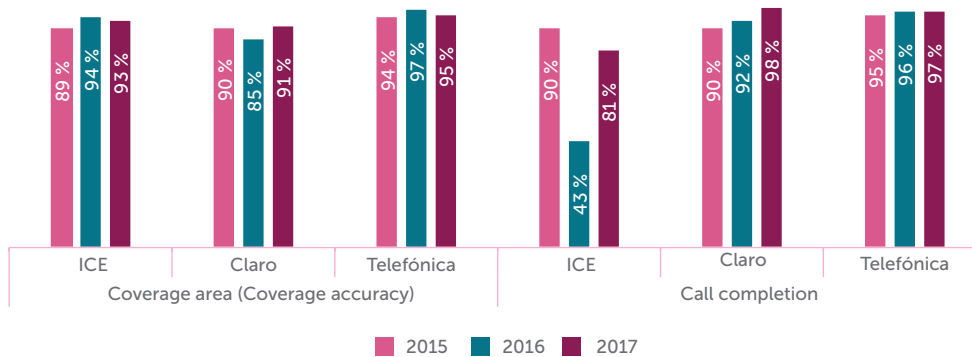
of the total number of complaints received, the details of which are indicated below.

For Claro, an increase of 43.5 % is registered for 2017 (which implies an increase of 100 complaints compared against the previous year) These are divided into 51.7 % due to billing errors, 14.7 % due to quality of service issues, 10.4 % to provisioning issues, 8.6 % due to fraud, 7.7 % due to contractual conditions and 7.0 % due to others.

ICE registered a decrease of 15.9 % (which implies 41 less complaints) compared against the previous year. The total is divided into 24.8 % due to quality of service issues; 24.3 % due to throttling; 19.2 % to billing errors; 9.4 % due to provisioning issues; 8.4 % due to content text message, 3.7 % due to contractual conditions and 10.3 % due to others.

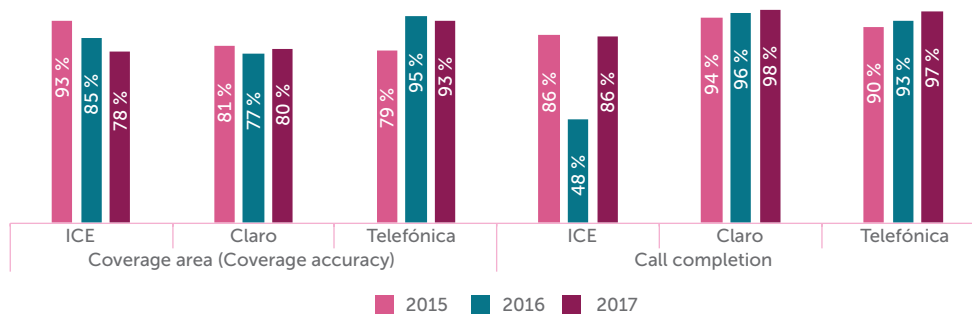


Graph N° 134
Costa Rica. Percentage of samples that meets the regulatory threshold for 2G networks per operator, 2015-2017
(Numbers in percentages)



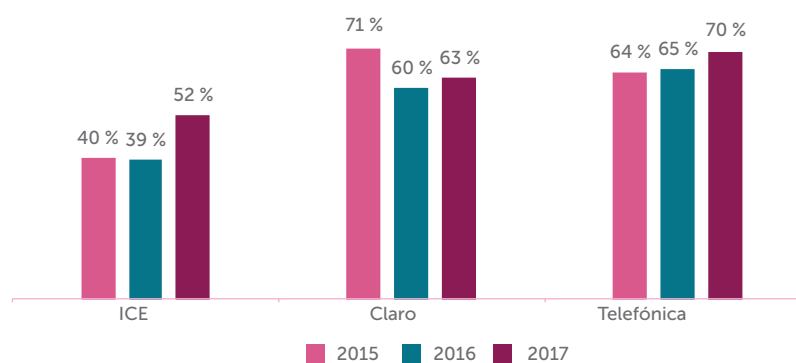
Source: SUTEL, General Directorate for Quality.

Graph N° 135
Costa Rica. Percentage of samples that meets the regulatory threshold for 3G networks per operator, 2015-2017
(Numbers in percentages)



Source: SUTEL, General Directorate for Quality.

Graph N° 136
Costa Rica. Evolution of the average performance of the measure speed compared against to the contrated speed for 3G networks per operator, 2015-2017
(Numbers in percentages)



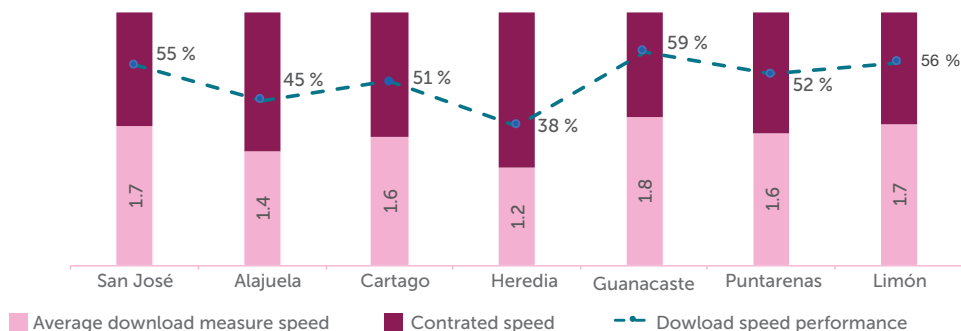
Source: SUTEL, General Directorate for Quality.



Graph N° 137

Costa Rica. Average download measure speed compared against the contracted download speed (3 Mbps) and download speed performance per province for the ICE 3G networks, 2017

(Numbers in Mbps and percentages)

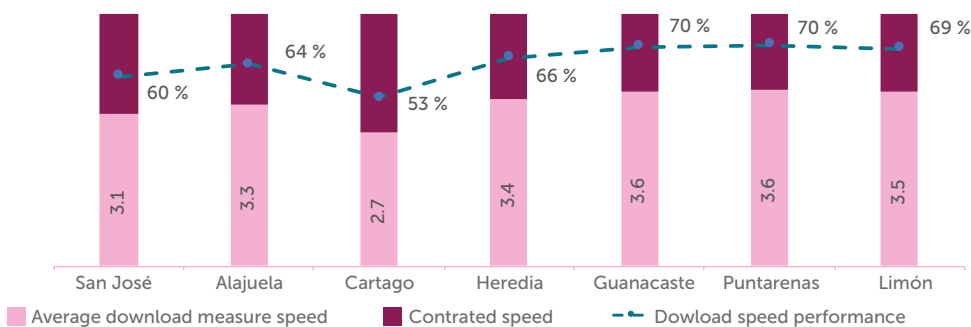


Source: SUTEL, General Directorate for Quality.

Graph N° 138

Costa Rica. Average download measure speed compared against the contracted download speed (5 Mbps) and download speed performance per province for Claro 3G networks, 2017

(Numbers in Mbps and percentages)

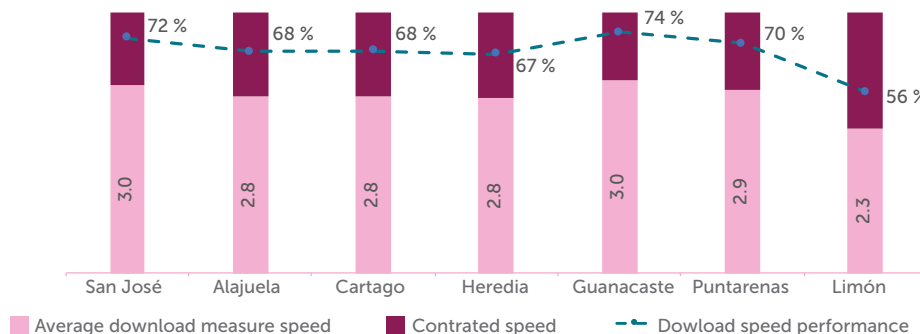


Source: SUTEL, General Directorate for Quality.

Graph N° 139

Costa Rica. Average download measure speed compared against the contracted download speed (4 Mbps) and download speed performance per province for Telefónica 3G networks, 2017

(Numbers in Mbps and percentages)



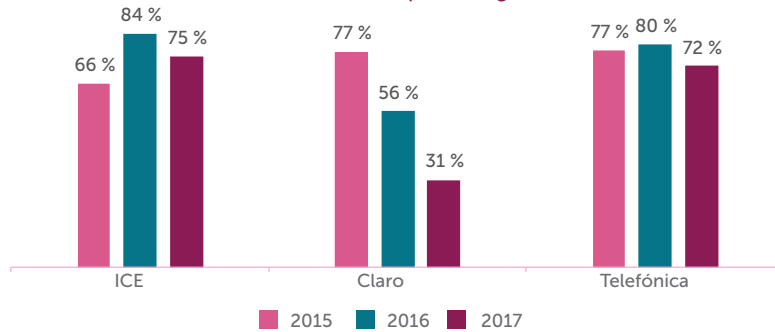
Source: SUTEL, General Directorate for Quality.



Graph N° 140

Costa Rica. Evolution of the average performance of the measure speed compared against the contracted speed for 4G networks per operator, 2015-2017

(Numbers in percentages)

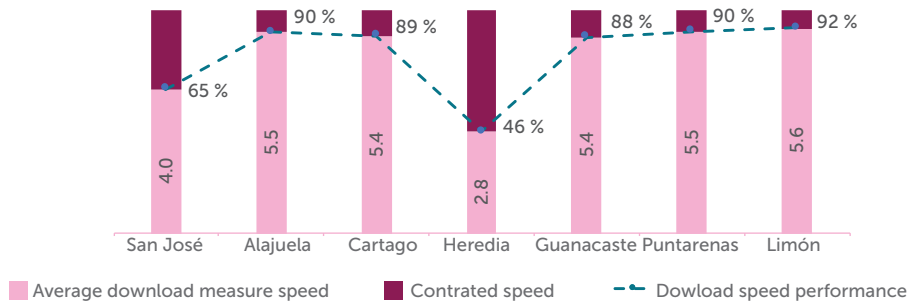


Source: SUTEL, General Directorate for Quality.

Graph N° 141

Costa Rica. Average download measure speed compared against the contracted download speed (6 Mbps) and download speed performance per province for the ICE 4G networks, 2017

(Numbers in Mbps and percentages)

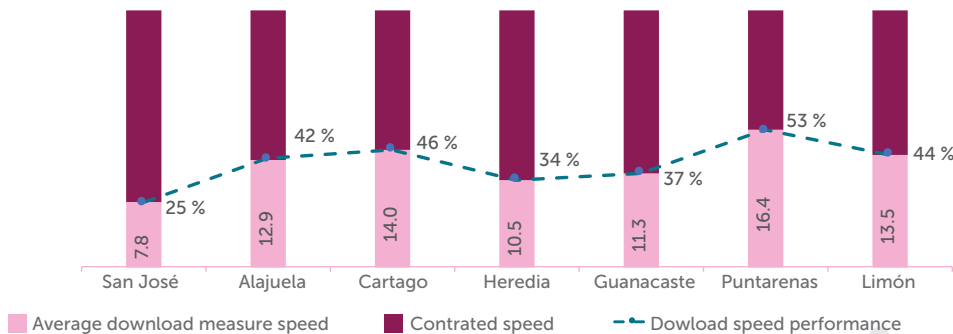


Source: SUTEL, General Directorate for Quality.

Graph N° 142

Costa Rica. Average download measure speed compared against the contracted download speed (30 Mbps) and download speed performance per province for Claro 4G networks, 2017

(Numbers in Mbps and percentages)



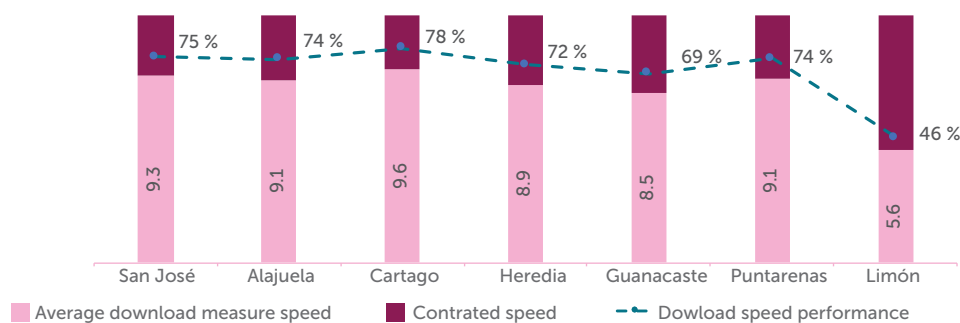
Source: SUTEL, General Directorate for Quality.



Graph N° 143

Costa Rica. Average download measure speed compared against the contracted download speed (12 Mbps) and download speed performance per province for Telefónica 4G networks, 2017

(Numbers in Mbps and percentages)

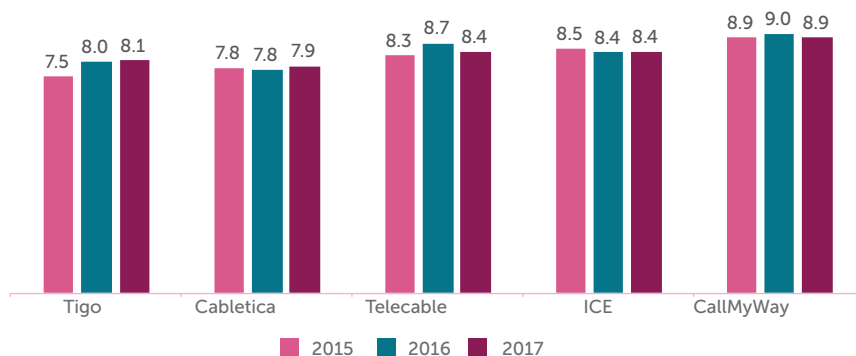


Source: SUTEL, General Directorate for Quality.

Graph N° 144

Costa Rica. Quality perception and degree of satisfaction score of fixed telephony (traditional and VoIP), 2015-2017

(Numbers in units¹)



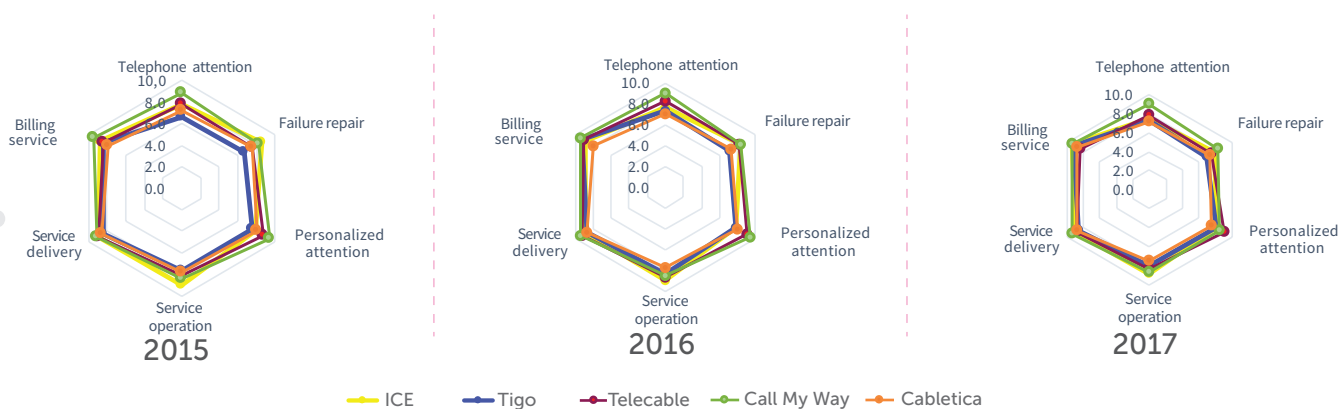
¹ The indicator fluctuates between 1 and 10, 10 been the highest

Source: SUTEL, General Directorate for Quality.

Graph N° 145

Costa Rica. Quality perception and degree of satisfaction score of fixed telephony (traditional and VoIP) per evaluated aspect, 2015-2017

(Numbers in units¹)

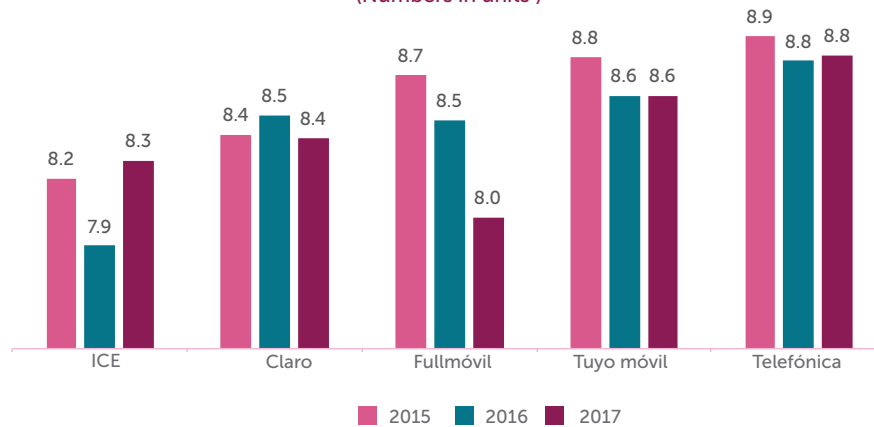


¹ The indicator fluctuates between 1 and 10, 10 been the highest

Source: SUTEL, General Directorate for Quality.

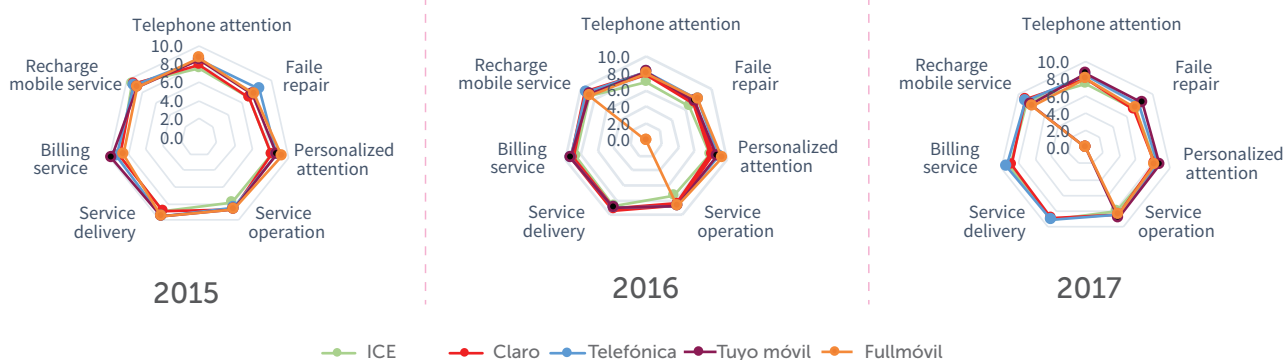


Graph N° 146
Costa Rica. Quality perception and degree of satisfaction score of mobile telephony, 2015-2017
(Numbers in units¹)



¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

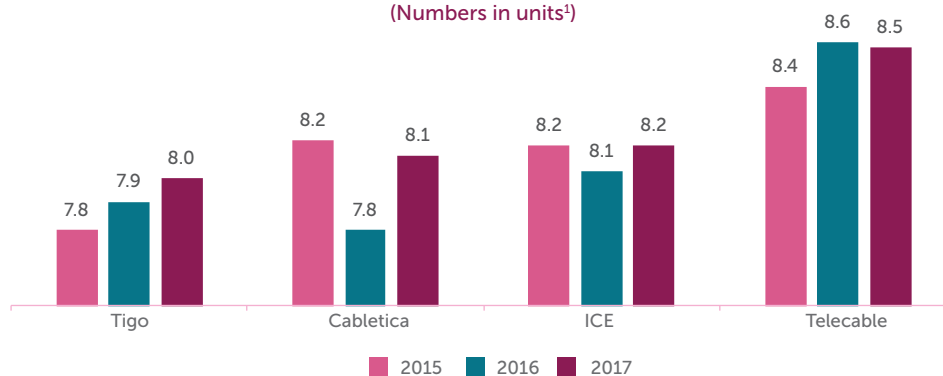
Graph N° 147
Costa Rica. Quality perception and degree of satisfaction score of mobile telephony per evaluated aspect, 2015-2017
(Numbers in units¹)



¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

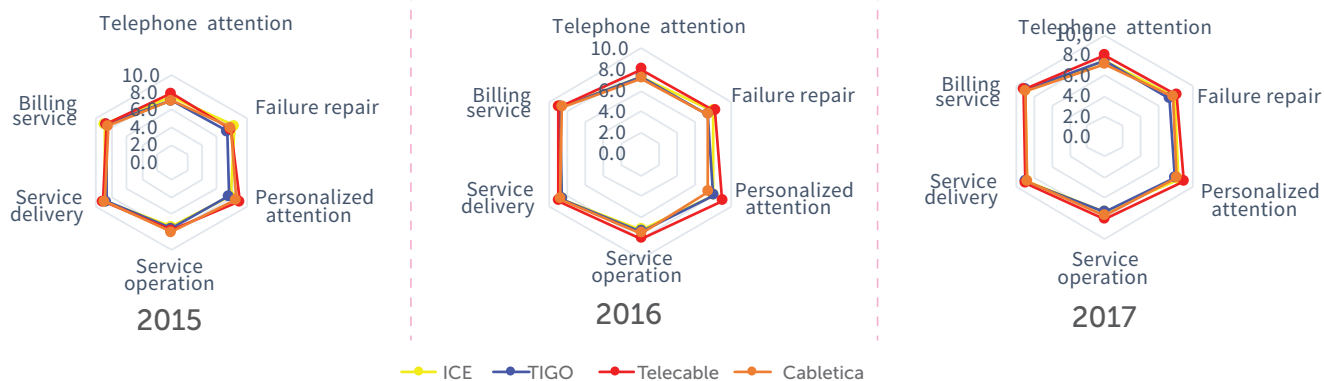


Graph N° 148
Costa Rica. Quality perception and degree of satisfaction score of fixed Internet, 2015-2017
(Numbers in units¹)



¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

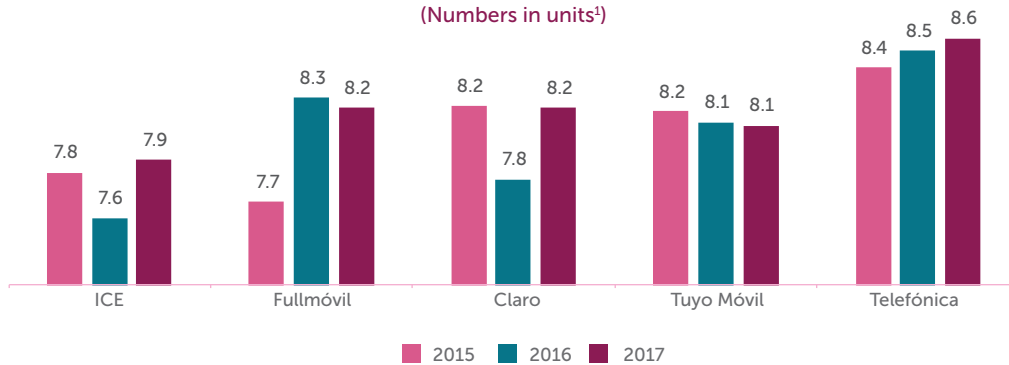
Graph N° 149
Costa Rica. Quality perception and degree of satisfaction score of fixed Internet per evaluated aspect, 2015-2017
(Numbers in units¹)



¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

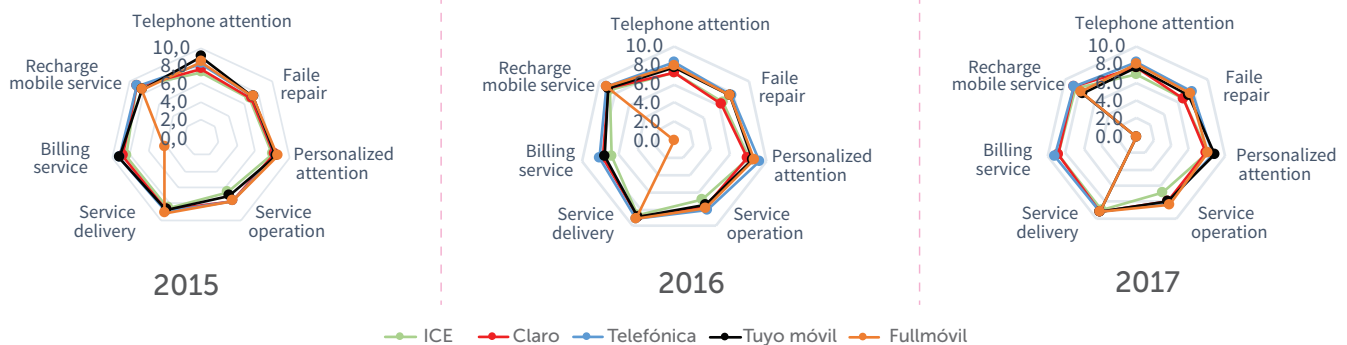


Graph N° 150
Costa Rica. Quality perception and degree of satisfaction score of mobile Internet, 2015-2017
(Numbers in units¹)



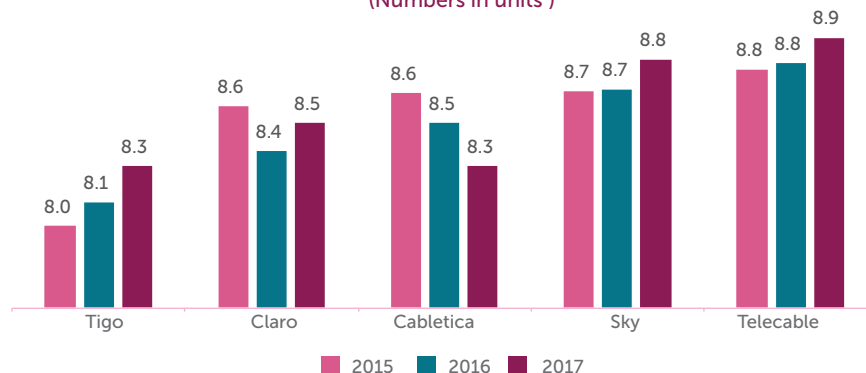
¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

Graph N° 151
Costa Rica. Quality perception and degree of satisfaction score of mobile Internet per evaluated
(Numbers in units¹)



¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

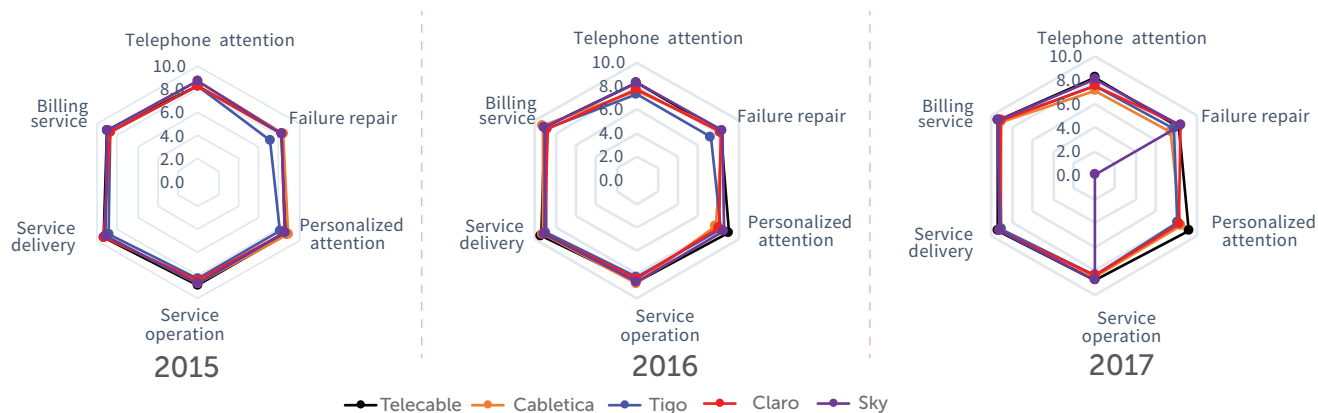
Graph N° 152
Costa Rica. Quality perception and degree of satisfaction score of pay television, 2015-2017
(Numbers in units¹)



¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

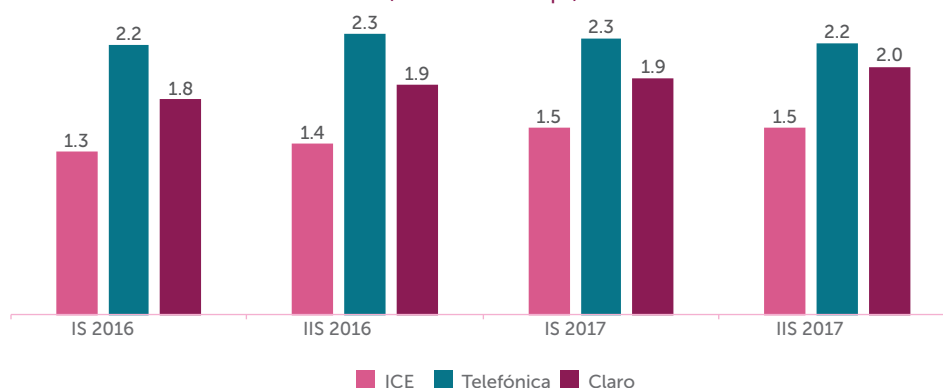


Graph N° 153
Costa Rica. Quality perception and degree of satisfaction score of pay television per evaluated aspect, 2015-2017
(Numbers in unidades¹)



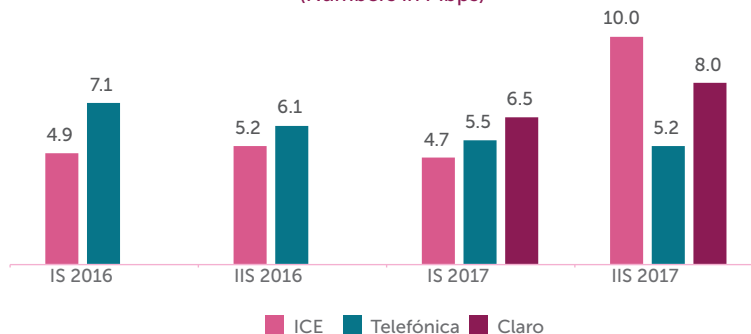
¹ The indicator fluctuates between 1 and 10, 10 been the highest
Source: SUTEL, General Directorate for Quality.

Graph N° 154
Costa Rica. Download speed 3G network per operator, 2016-2017
(Numbers in Mbps)



Source: OpenSignal, reports acquire by SUTEL, General Directorate for Quality.

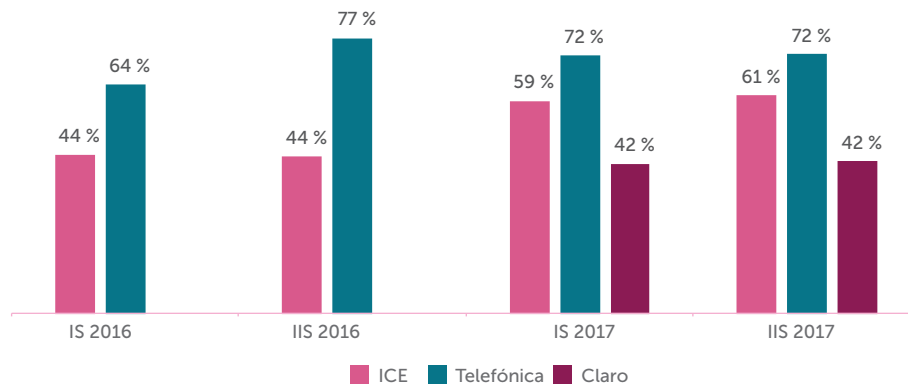
Graph N° 155
Costa Rica. Download speed 4G network per operator, 2016-2017
(Numbers in Mbps)



Source: OpenSignal, reports acquire by SUTEL, General Directorate for Quality.

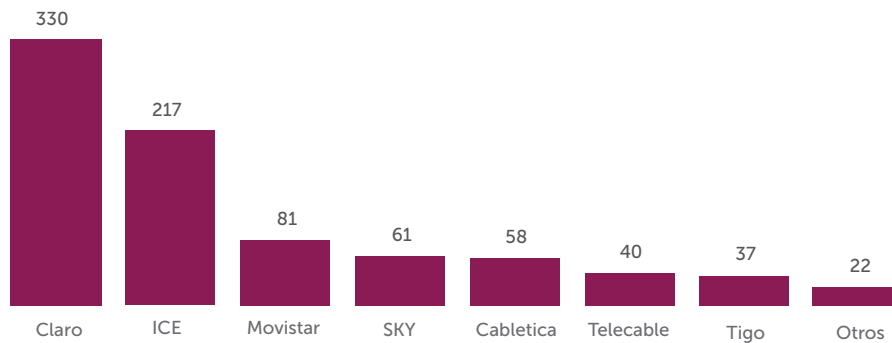


Graph N° 156
Costa Rica. Availability 4G network per operator, 2016-2017
 (Numbers in percentage)



Source: OpenSignal, reports acquire by Source: SUTEL, General Directorate for Quality.

Graph N° 157
Costa Rica. Quantity of complaints filed at SUTEL per operator, 2017



Source: SUTEL, General Directorate for Quality.



FONATEL



FONATEL

FONATEL advances and the gap narrows: with 20,452 millions of colones invested in programs and projects since 2012, universal access and service is a reality in the country.

Operative Indicators about FONATEL

This chapter presents a summary of the indicators associated to the results obtained from the intervention of SUTEL thru the National Fund of Telecommunications (FONATEL). To facilitate understanding, they are grouped into three categories: cross-sectional indicators (general results), indicators by program (results per program and project) and indicators of perception of the demand (subjective view of the benefits of the services provided).

Cross-sectional Indicators

Cross sectional indicators highlight the following general results about the administration of FONATEL and the administration of programs and projects associated to the end of 2017:

- FONATEL's portfolio of programs and projects reached 6 programs and 36 projects in development (19 in the phase of execution, 15 in production and 2 in formulation and adjudication)¹. Compared to 2012, these result evidence an increase of 35 projects, 6 project a year in average ([see graph N° 158](#)).
- A total of 413 districts covered by the programs in phase of production correspond to 114,825 households and 392,007 people benefitted² ([see graph N° 159](#)).
- A total of 46,928 technological devices (portable computers, tablets, etc.) provided to institutions and households to generate broadband technological solutions for the reduction of the digital gap in a comprehensive manner ([see graph N° 160](#)).
- The total value of FONATEL is 171,551 million colones, highlighting the impact of the investments done in

¹ The implementation of programs financed by FONATEL started in 2012 with the creation of the Communities Connected Program (PCC). The process for the Households Connected started in 2015 (PHC), in 2016 the Public Centers Connected Program (PCPC) and in 2017 the programs Public Spaces Connected (PEPC), Solidary Broadband (PBAS) and Citizens Connected (PCiC).

² The calculation of the population being benefitted considered the amount of numbers indicated in the previous paragraph multiplied by the proportion of people per home estimated by the National Institute of Statistic and Census (INEC) for each of those years in the National Census of Homes (ENAH0), namely 3,30 (2014 and 2015) and 3,26 (2016).



the last quarter of 2016 and the earnings from the Contribución Especial Parafiscal (CEPF) ([see graph N° 161](#)).

- The accumulated investment in the program and projects management is 20,452 million colones, and 2017 is the year that registers the highest disbursement with 12,782 million colones (62 % of the total budget spent) ([see graph N° 162](#)).
- The investment by program presents the following distribution 6,060 million colones (47.4 %) from the Households Connected Program³; 4,752 million colones (37.2 %) for the Public Centers Equipped Program⁴; and 1,971 million colones (15.4 %) from the Communities Connected Program⁵ ([see graph N° 163](#)).
- Approximate investment of 20,000 colones per person, 69,500 colones per home and 132,500 colones per Centro de Prestación de Servicios Públicos (CPSP).
- Greater involvement from the operators in the development of programs and projects. FONATEL goes from working thru 2 operators in 2013 for the execution of resources to 10 in 2017. In 2017 the 12,783 million colones disbursed by SUTEL/FONATEL in the different programs were distributed among Radiográfica Costarricense (RACSA) with 37 %, Televisora de Costa Rica (Cabletica) with 23 %, Instituto Costarricense de Electricidad (ICE) with 18 %, Telecable T.V.E.S.A. with 11 %, Claro CR Telecomunicaciones (Claro) with 6 %, Cooperativa de Electrificación Rural de San Carlos (Coopelesca) with 2 %, and Cooperativa de Electrificación Rural de Los Santos (Coopeasantos) 2 %. The entrance of new operators responds to the entrance into the phase of production of the Public Centers Equipped Program ([see graph N° 164](#)).

Indicators by FONATEL Program

The main results obtained from the development of the portfolio of SUTEL/FONATEL projects are presented in this section, by program and project for the 2012-2017 period.

Communities Connected Program (PCC)

The development of the Communities Connected Program started in 2012, and was the first of 6 projects developed by SUTEL /FONATEL. Since then, and until the closing of 2017, a total of 32 projects have

We went from a single Project dedicated to providing access to services in 2012 to 36 projects for the comprehensive attention of the digital gap in the country.

been started in their different phases, covering the 6 regions of planning defined by the Ministry of National Planning and Economic Policy (MIDEPLAN) and 16 indigenous territories ([see graph N° 165](#)). This coverage is possible thanks to the participation of 3 operators of telecommunications networks: (18 projects), Claro Telecomunicaciones CR S.A. (5) and Telefónica Costa Rica TC S.A. (3).

³ The Households Connected Program provides a direct subsidy using resources from FONATEL to 140 497 households with income between quintiles 1 to 3 and previously selected by the Instituto Mixto de Ayuda Social (IMAS). This subsidy goes entirely to the acquisition of the service of fixed internet at a speed of 2 megas and a portable computer. The subsidy follows a scale (80 %, 60 % y 20 %) and applies "base" prices preset by SUTEL, namely: 10 000 colones (single price) and 450 dollars (maximum price subject to the minimum physical and logic features) accordingly..

The Program has a maximum duration of 6 years, starting on June 6, 2016. During the first 3 years, telecommunications service providers registered may subscribe service contracts with households.

⁴ The Public Centers Connected Program corresponds to a group of projects focused on the reduction of the gap to access telecommunications services, providing technological solutions (devices to access broadband) at the CPSP. This program currently has 3 projects, namely: Project I and II – Provision of technological solutions: delivery of devices to access internet in schools from the Ministry of Public Education (MEP), Smart Community Centers (CECI), Centros de Educación y Nutrición y de Centros Infantiles de Atención Integral (CEN-CINAI), as well as hospitals, health centers and clinics belonging to CCSS. Project III: equip MEP, CEN-CINAI and CCSS and other institutions in populations at risk with solutions and broadband devices. It also considers the development of CECI 3.0 or centers of innovation.

⁵ This program wants to extend the offer of telecommunications services to the population and at Centros de Prestación de Servicios Públicos (CPSP or institutions that provide public services) in areas of the country where the cost of installation and maintenance of the infrastructure are not cost effective (rural areas, far away and catalogued as areas of social, economic and cultural risk and indigenous territories).

In addition to the 16 indigenous territories included in this Program. 5 are being served within the framework of other projects that area already in progress. The remaining 3 to complete 24 indigenous territories are pending approval to develop the infrastructure within their territories, after a process of constructive dialogues regarding their autonomy, to complete 100 % of the territory of the country.

| Formulation/ adjudication | Execution | Production |
|--|---|--|
| Central Region 16 indigenous territories | Atlantic Huetar Region Chorotega Region Central Pacific Regionl | North Huetar Region Brunca Region |

The goal of the coverage of the Program is 184 districts to the closing of 2017. To December of 2017, there is an effective coverage of 56 districts ([see figures N° 10 and N° 11](#)), for a 30 % progress, corresponding to 90,558 homes and 293,407 persons. In 2014 there were 2 districts covered, 8,553 homes and 28,224 persons; 12 districts in 2015, 23,254 homes and 76,739 people and in 2016, 32 districts and 72,892 homes and 237,639 people and in 2017 ([see graph N° 166](#)).

The connectivity of 641 Centros de Prestación de Servicios Públicos (CPSP) was defined as part of the formulation of the projects under the Communities Connected Program. For the end of 2017 there is a 71 % progress in the compliance of this goal (455 CPSP's connected), the remaining 29 % corresponds to 186 CPSP (69 in Sarapiquí, 62 in Upala, 30 in San Carlos and 25 in Pérez Zeledón) in process of connection with due date at the end of 2018. ([see graph N° 167](#) and [table N° 38](#)).

Analyzing the numbers of subscription by service, it is verified that the homes in the areas covered by the Program have a higher preference for mobile services ([see graph N° 168](#)). In 2014, with the projects Roxana and Siquirres in their production phase, there are a total of 60 subscriptions to the mobile telephony service (voice and Internet), all corresponding to the Project of Siquirres, as well as 13 and 18 subscriptions to the fixed telephone and fixed Internet access service respectively, both quotas corresponding to the Roxana Project. In 2015, subscription to the service of fixed telephony reached 812 (Siquirres) corresponding to the services of

fixed telephony and fixed Internet access to 10 and 19, respectively, 9 and 18 from Roxana and 1 for each service in Siquirres.

In 2016, the subscriptions to mobile telephony increased significantly as of the start of the production phase of projects in San Carlos, Upala, Sarapiquí, Guatuso and Los Chiles, that added up to 42,586. During this year San Carlos registered 13,049 (31 %) subscriptions to this service; Los Chiles, 9,631 (23 %); Sarapiquí, 7,057 (16%); Upala 6,884 (16 %); Guatuso 4,434 (10 %); and Siquirres registered 1,531 (4 %).

In 2017 subscriptions to the mobile telephony service decreased by 14 % compared to 2016, for a total of 36,732, situation that is similar to the beginning of the production phase of the Project Perez Zeledon. Specifically, from the total of subscriptions registered this year, 13,831 (38 %) correspond to Los Chiles; 5,471(15 %) to Guatuso; 5,152 (14 %) to San Carlos; 3,875 (10 %) to Sarapiquí; 3,319 (9 %) to Upala; 2,646 (7 %) to Pérez Zeledón and 2,438 (7 %) to Siquirres.

Subscriptions related to the services of fixes telephone and fixed Internet, though they maintained a growing trend during 2016-2017, their increase was not significant compared to the growth of the mobile telephone service during the same period ([see graphs N° 169, N° 170 and N° 171](#)).

1,971 million colones of FONATEL were implemented in 2017 thru the Communities Connected Program, a much higher figure (3,923 %) than the 49 million colones spent in 2013, but below the amounts implemented in 2014 (3,077 million colones) and 2015 (2,878 million colones). The variation between the amounts of budget implemented is explained as of the entrance in production of new projects, as well as the processes of settlement (payment) by network operator and project ([see graph N° 172](#)).

Reviewing the annual numbers of participation in the executed budget per operator under the Communities Connected Program, the variations are reflected in the series of total disbursements. In 2013 Telefonica appears as the operator with the greatest participation in the budget executed, with 79 % versus 21 % of ICE. In 2014 Claro took 82 % of the resources; Telefonica 17 % and ICE 1 %. In 2015, the funds were distributed between ICE (74 %) and Telefónica (26 %), just as in 2013. Claro did not receive any payment during this year.



In 2016, once again, Claro received the highest percentage of resources executed (98 %); Telefónica, 2 %, approximately; and ICE a participation below 0.5 %; while in 2017 ICE received 61 % of all the resources executed. Claro, 37 %; and Telefónica, 2 % ([see graph N° 173](#)).

Households Connected Program

At the end of December 2016, after 6 months in production phase, the Households Connected Program registered 10,089 homes who had received benefits from the program. In June 2017 this figure reached 17,820 homes and experienced a 77 % increase. To December of 2017, the number reached 30,432, 71 % more than in June of 2017 and a 202 % above the number registered in December of 2016. This represents an average monthly increase of 1,700 subscriptions (10 %), approximately ([see graph N° 174](#)).

To December of 2017, the total number of homes benefited (30,432), 28,832 had an active subscription (they have Internet and a portable computer) and 1,600 have cancelled the service only have a portable computer).

[Graph N° 175](#) compares the number of homes and the average number of people effectively benefited by the program for the years 2016 and 2017, considering, only, active households and the proportion of people by home estimated by the INEC⁶. In this regard, the program benefited in 2016 an average of 32,890 people and 98,600 people in 2017. This corresponds to approximately a 200 % increase.

Analyzing the quotas of beneficiaries by province in 2017, San Jose ranks number one with 9,178 homes, a figure 182 % above the number registered in December of 2016 (3,259 households), followed by Alajuela with 5,229 homes in December of 2017, 203 % higher than the one reported in December of 2016 (1,721 households). Guanacaste and Puntarenas are on the third place, both provinces with similar number of beneficiaries both for 2017 (4,186 and 4,904 households respectively), and for 2016 (2,492 and 2,537, households respectively).

Then we can find: Heredia with 2,942, Limón with 2,121 and Cartago with 1,872 households benefited to the end of 2017. It is important to mention that between December of 2016 and 2017 Heredia surpassed Limón. ([See table N° 39 and graph N° 176](#)).

[Figure N° 11](#) evidences the geographic coverage of the program as well as the intensity per zone. Regarding this, we can see that the areas with more percentage of homes benefited by the Program are disaggregated all around the map of Costa Rica.

At the time of closing in 2017, approximately 82 % of the homes benefitted belonged to quintile 1, a percentage that has been going down since December of 2016 when approximately 97 % belonged to the quintile of entrance. This figure evidences that the program is reaching the base of the pyramid of income of the Costa Rican population⁷ ([see graph N° 177 and table N° 40](#)).

Nowadays the Connected Households Program works with 7 telecommunications service providers. However, only one of them has between 45 % and 50 % of the total of homes benefited during the entire period of the production phase. By the end of 2016, Cabletica grouped 5,018 (50 %) of the subscriptions, followed by Telecable with 2,124 (21 %) and ICE with 1,237 (12 %); the rest are distributed among Coopelesca, Millicom Cable Costa Rica S.A., (Tigo), Coopesantos and Coopeguanacaste. On the other hand, there was a re distribution of quotes to December of 2017 in the following suppliers: Cabletica, Telecable, Coopelesca and Coopesantos with a 45 %, 21 %, 6 % and 4 % share. In regards to ICE and TIGO, these increased their share in 2 and 3 perceptual points respectively ([see graph N° 178 and table N° 41](#)).

734 million colones were executed during 2016; Cabletica received 57 %, Telecable 19 %, ICE 14 %, and Coopesantos and Coopelesca 5 %, respectively⁸ ([see graph N° 179](#)).

In 2017 the amount disbursed increased by 826 %, reaching 6,060 million colones. This is explained mainly by two elements: Late presentation of requests

⁶ Average number of persons per home, according to the ENAHO of the INEC: 3.26 and 3.24 persons per home FOR 2016 AND 2017 accordingly.

⁷ In this regard it is important to clarify that the scope of this program reaches quintiles 3 and decile 5 of income (vulnerable populations), including households with low income, poor or in extreme poverty, whose monthly income results insufficient to cover basic needs in telecommunications (accessibility). Therefore, the decrease in the percentage of homes in quintile one means an improvement in the distribution of the benefits offered by the Program to the target population.

for settlement and a change in the way of payment of portable computers to participating suppliers; going from a deferred payment to cash. Thus, at the end of this year, the amount disbursed per telecommunications service provider was distributed as follows: Cabletica (30 %), Telecable (29 %), ICE (26 %) and Coopesesca (7 %), Coopesantos (5 %), Tigo (3 %) and Coopeguanacaste (0, 1 %) ([See graph N° 180](#)).

Connected Public Centers Program

Out of the 18,533 devices included as the goal in the bid for the first project of the Connected Public Centers Program, the Ministry of Education (MEP) would receive 13,194 (71 %), Ministry of Science and Technology (MICITT) 2,529 (14 %), ICENCINAI 651 (3 %) and the CCSS 2,159 (12 %) ([see graph N° 181](#)).

funds were adjudicated in 2017 to RACSA in consortium with the company PC Central in 2017.

Perception Indicators on the Performance of FONATEL

The following is an excerpt of the indicators associated with the annual evaluation of the perception of the use and utilization of the services provided through the Connected Communities and Connected Homes programs of FONATEL corresponding to the year 2017, carried out by SUTEL from March to May 2018.

Regarding the applied survey of the Connected Communities Program, the following results stand out:

- a) In order to characterize the households surveyed, some general details are provided, namely:
 - 74.1 % of homes are made up of 3 to 7 people.
 - 49 % of households have children between 1 and 12 years old; while 25 % of households have teenagers between 13 and 17 years old. This shows a significant share of the schoolage population covered by the Program, a result that is ratified with the following data: on average, 45 % of households include 1 to 2 students.
 - In 16 % of households there is at least one person with a disability; and in 4 % there are 1 to 4 indigenous people. This reveals that, in addition to the low profitability of the areas intervened through the Connected Communities Program, there are also populations in conditions of social and cultural vulnerability that have benefited from the program.
 - In 51 % of the households the head of family is female, mostly aged between 36 and 45 years (23 %) and with complete primary education (32 %).
- b) In the areas covered by the Program, which has been progressively implemented since 2012, 98 % of the households interviewed indicated that they have mobile telephony service (prepaid and postpaid), 31 % fixed Internet service, and 14 % fixed

TO 2017, FONATEL's programmes cover 413 districts of the country; equivalent to more than 85 % of them.

To the end of 2017, 6,407 (35 %) equipment had been delivered to institutions and 12,126 (65 %) were pending for delivery. The Ministry of Education (MEP) stands out due to the closing of schools during the months of December and January; this affects the process of coordination of deliveries.

Analyzing the results by institution, both MICIT and CENCINAI receive 100 % of the equipment required in 2017; that is, 2,529 and 651 respectively. In the case of MEP and CCSS 81 % (10,628) are pending for delivery mainly because of the exoneration process in Customs, given the authority FONATEL has and that has exercised on the administration ([see graph N° 182](#) and [table N° 42](#)).

A total of 4,742 million colones were disbursed for the implementation of this Program. The totality of the

⁸ In the case of Tigo and Coopesesca they do not have participation in the resources executed during this year due to delays in the presentation their closing statements.

⁹ Agreement of the Council of SUTEL 009-016-2017 of February 22, 2018.



telephone service. The mobile telephone service is mostly prepaid (65 %). The query shows similar percentages according to the planning region (see [graph N° 183](#)).

c) When consulting about the main use of the Internet access service, the following stand out: social networks (49 %), study (42 %), email (34 %), download information (29 %), and communication (25 %) ([see Table N° 43](#)). When analyzing the results obtained from this consultation by region, it is found that only in the case of the Huetar Atlántico region, the use of electronic mail exceeds the study category; in addition, 31 % of households surveyed in this region indicated that they use the Internet service to read the newspaper.

d) 91 % of the households interviewed indicated that they use the Internet access service every day of the week. This percentage is higher in the case of the Brunca (92 %) and Huetar Atlántico (94 %) regions than in other regions ([see graph N° 184](#)). In addition, 64 % of the households interviewed indicated that they use the Internet access service for more than 4 hours a day.

e) In general terms, the provision of telecommunications services offered in the regions covered by this Program was rated with 7.5 and 9 in some disaggregations of this variable ([see graph N° 185](#)).

On the other hand, from the evaluation applied to the Connected Homes Program, the following aspects are extracted:

- a) In order to characterize the households surveyed, some general details are provided, namely:
 - In 62 % of the households surveyed, the head of the household is a woman, aged between 26 and 45 years (57 %) and with incomplete primary education (38 %). These results are accentuated in the case of the first income quintile.
 - 55 % of households are composed by 3 to 4 people.
 - In general, the characteristics show the socioeconomic vulnerability of the homes served through the Connected Homes Program.

b) 81 % of households said that they did not have Internet and computer services before being part of the Connected Homes Program. When reviewing this result according to income quintile, there is an inverse relationship between both; namely: quintile 1 - 84 %, quintile 2 - 73 % and quintile 3 - 66 % (see [graph N° 186](#)).

c) In terms of program evaluation, 38 % of surveyed households rate the speed of the subsidized internet access service through the Connected Household Program “good to very good”; while 35 % categorize it as “from regular to good”; and 26 % “from bad to regular”. These results show little variation according to income quintile ([see graph N° 187](#)).

d) 51 % of households rated the continuity of the subsidized internet access service “good to very good” through the Hogares Conectados Program, 30% rated it “from regular to good” and 19 % “from bad to regular”. This percentage tends to decrease the higher the income quintile ([see graph N° 188](#)).

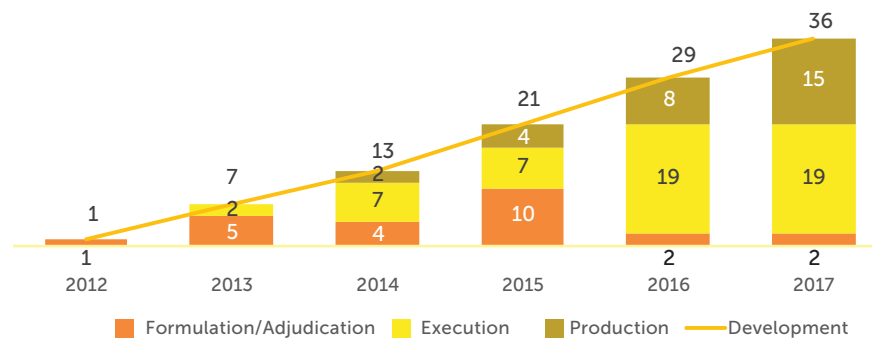
e) 89 % of households rated the subsidized laptop through the Program as “good to very good”. As in the case of the previous point, this percentage tends to decrease to a higher income quintile ([see graph N° 189](#)).

f) 96 % of the households indicated that they use the subsidized computer through the Program, mainly for study (96 %), entertainment (20 %) and work (13 %). These percentage ratios vary slightly by income quintile ([see graph N° 190](#)).

g) 77 % of the surveyed households said that they use the subsidized Internet access through the Program every day, a percentage that decreases with a higher quintile of income ([see graph N° 191](#)). In addition, 46 % of households indicated that they use this service for more than 4 hours a day. This same percentage was also obtained for the case of income quintiles 1 and 2. In the case of income quintile 3, the percentage is 8 percentage points lower.

h) 52 % of households indicated that at least one of their members has training in the use of the computer ([see graph N° 192](#)).

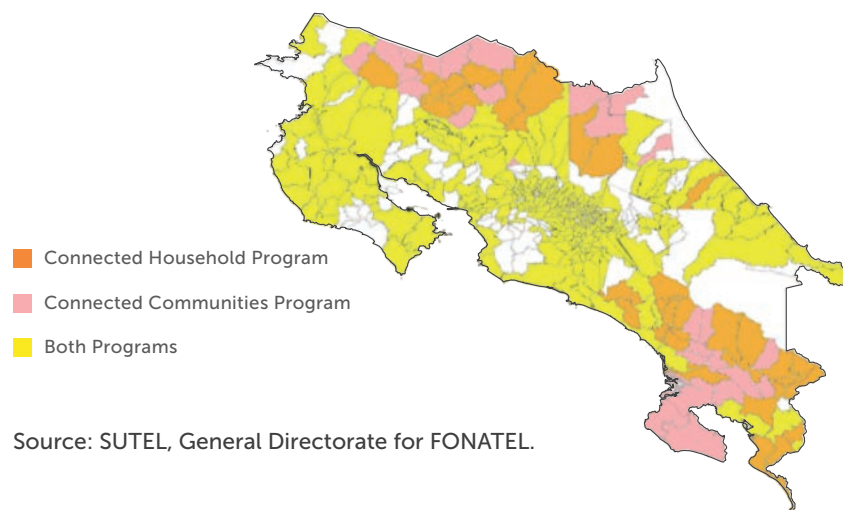
Graph N° 158
Costa Rica. Total amount of FONATEL projects in development, 2012-2017



Source: SUTEL, General Directorate for FONATEL.

Figure N° 9
Costa Rica. Geographic covering of FONATEL projects and programs, 2017

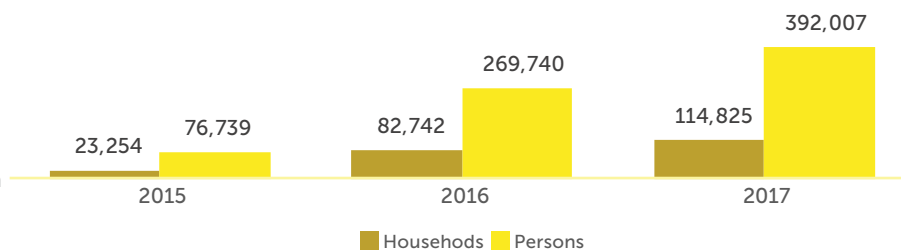
Seven provinces and
413
districts covered by
Connected Communities
and Connected
Households Programs.



Source: SUTEL, General Directorate for FONATEL.

Graph N° 159
Costa Rica. Number of households and average of persons with access to telecommunications services provided through FONATEL, 2015-2017

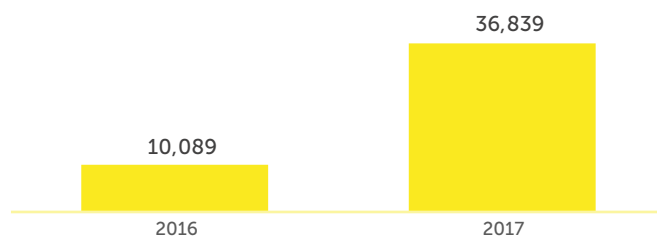
114,825
households and
392,007
people have access to
the telecommunication
services provided
through FONATEL.



Source: SUTEL, General Directorate for FONATEL.

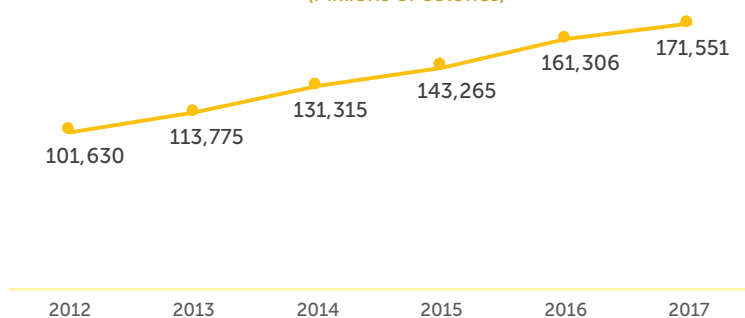


Graph N° 160
Costa Rica. Total amount of devices provided through FONATEL, 2016-2017



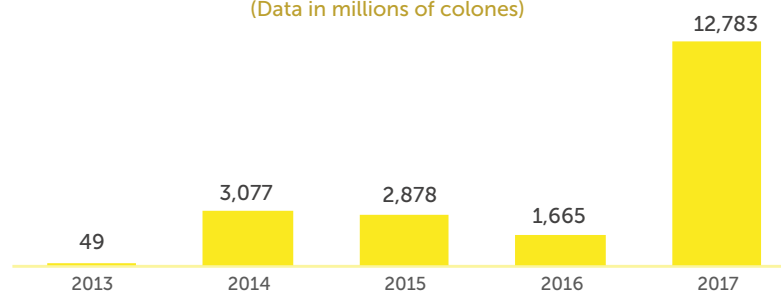
Note: Devices are the ones that have access to internet, for example: portable computers, tablets and others.
Source: SUTEL, General Directorate for FONATEL.

Graph N° 161
Costa Rica. Fonatel value 2012-2017
(Millions of colones)



Source: SUTEL, General Directorate for FONATEL.

Graph N° 162
Costa Rica. Investment on FONATEL Yearly Project and Programme Plan,
2013-2017
(Data in millions of colones)



20,452
million colones invested
to date in projects of
universal access and
service.

Source: SUTEL, General Directorate for FONATEL.

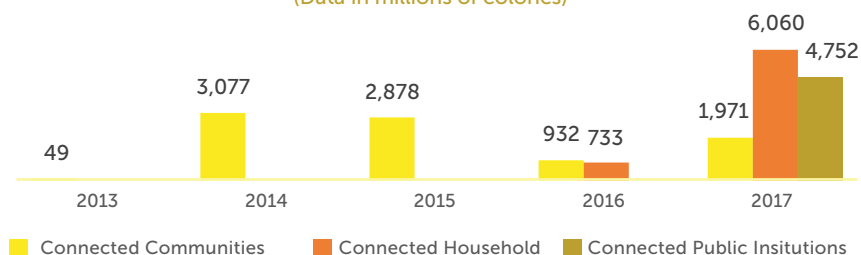
Graph N° 163

Costa Rica. Investment executed by FONATEL according to programme, 2013-2017
(Data in millions of colones)

Only in 2017, around

62 %

FONATEL's total investment was executed.

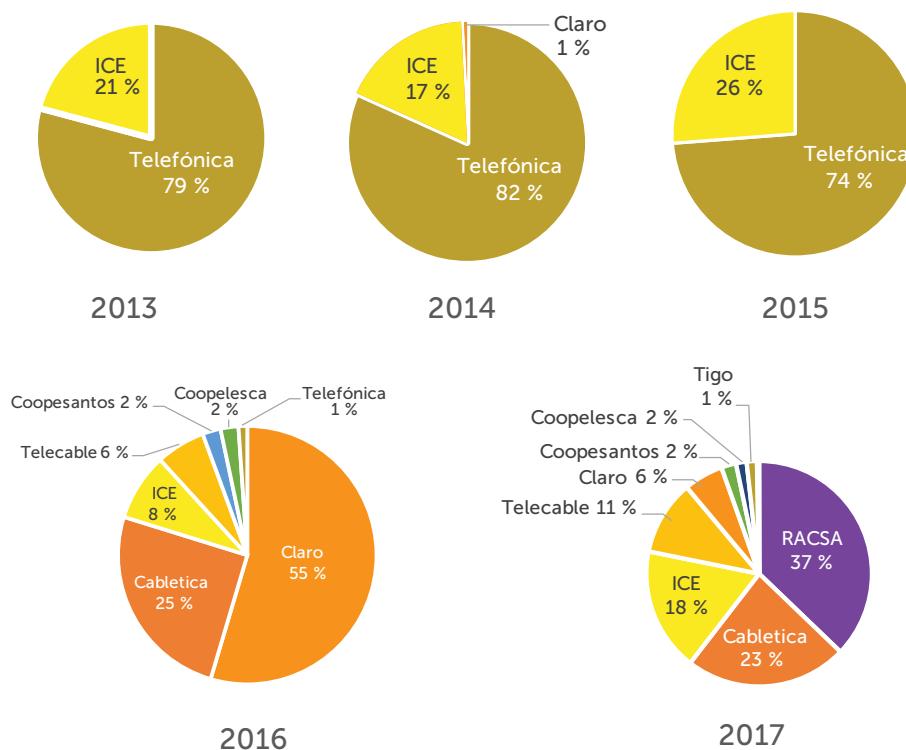


Source: SUTEL, General Directorate for FONATEL.

Graph N° 164

Costa Rica. Investment of FONATEL according to network operator and telecommunications services provider, 2013-2017

There is an evident **increase** in the participation of network operators and telecommunications service providers in the development of programs and projects funded by FONATEL.

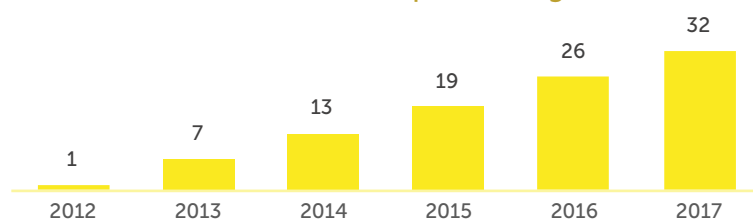


Source: SUTEL, General Directorate for FONATEL.



Graph N° 165

Costa Rica. Number of projects from the FONATEL Programme for Connected Communities, development stage, 2012-2017

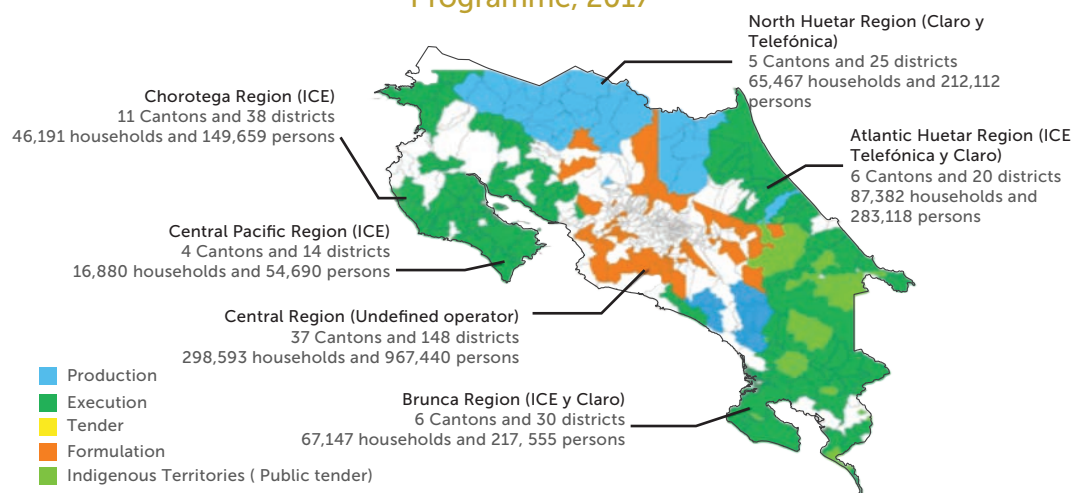


Note: Includes all projects on different development stages: formulation, adjudication, execution and production.

Source: SUTEL General Directorate for FONATEL.

Figure N° 10

Costa Rica. Geographic cover of Connected Communities Programme, 2017



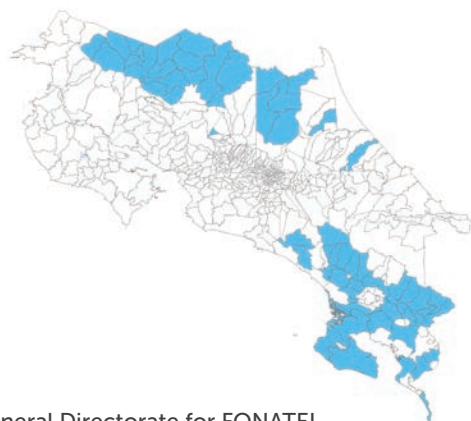
32

projects in progress in different phases of delivery, including 7 regions of planification and 24 indigenous territories.

Source: SUTEL, General Directorate for FONATEL.

Figure N° 11

Costa Rica. Geographic coverage of Connected Communities Program to 2017



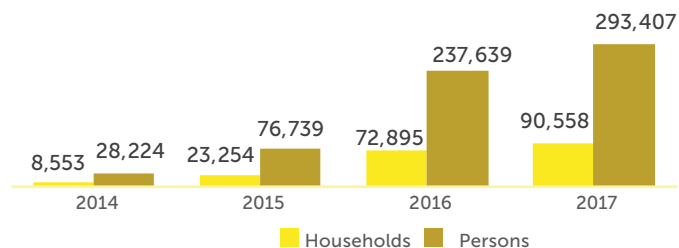
56

districts covered at the end of 2017.

Source: SUTEL, General Directorate for FONATEL.

Graph N° 166

Costa Rica. Total amount of households and persons covered by projects in production phase of the FONATEL Connected Communities Programme, 2014 – 2017

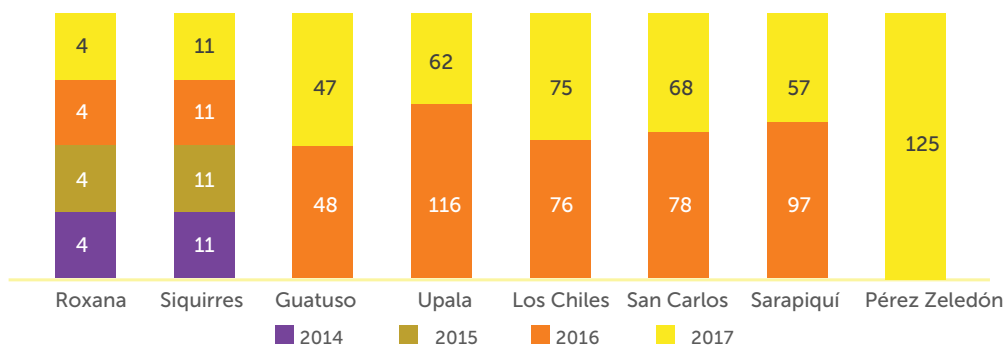


Source: SUTEL, General Directorate for FONATEL.

Graph N° 167

Costa Rica. Number of Public Services Provision Centre connected through the FONATEL Connected Communities Programme, 2014-2017

455
CPSP's connected in
Roxana, Siquirres, North
Huetar Region and Pérez
Zeledón.



Source: SUTEL, General Directorate for FONATEL.

Table N° 38

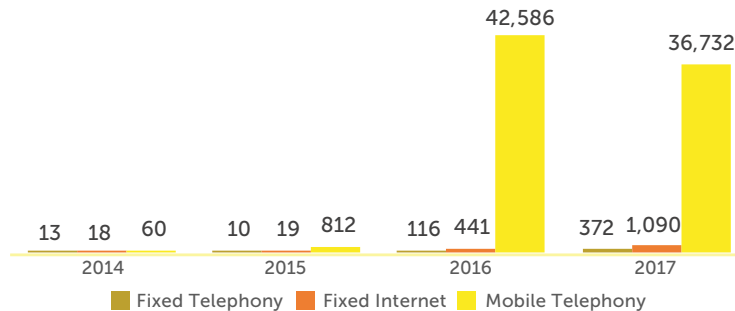
Costa Rica. Progress on connection for public centers equipped through the FONATEL Connected Communities Programme, 2014-2017
(Aggregated data)

| Project | Goal | Delivered | |
|---------------|------------|------------|------------|
| | | 2014 | 2017 |
| Roxana | 4 | 4 | 4 |
| Siquirres | 11 | 11 | 11 |
| Guatuso | 47 | 48 | 47 |
| Los Chiles | 75 | 76 | 75 |
| San Carlos | 98 | 78 | 68 |
| Sarapiquí | 126 | 97 | 57 |
| Upala | 130 | 116 | 68 |
| Pérez Zeledón | 150 | 0 | 125 |
| Total | 641 | 430 | 455 |

Source: SUTEL, General Directorate for FONATEL.



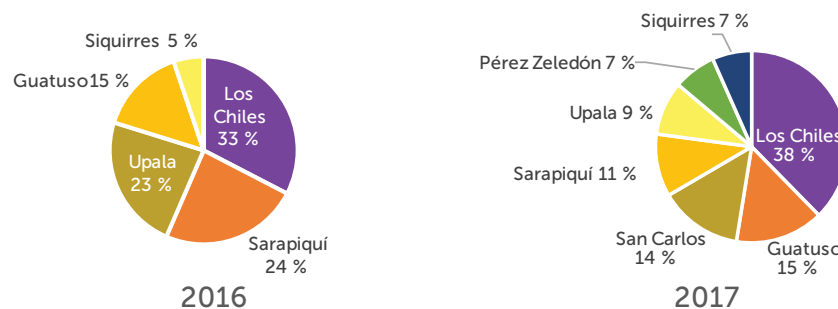
Graph N° 168
Costa Rica. Total amount of subscriptions to FONATEL's Connected Communities Programme, according to telecommunications services, 2014 – 2017



There is **more** demand for mobile services compared to fixed services.

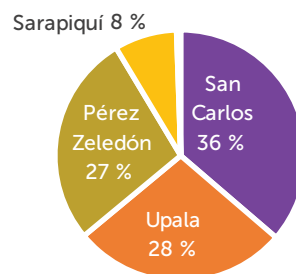
Source: SUTEL, General Directorate for FONATEL.

Graph N° 169
Costa Rica. Percentage of subscriptions to mobile telephony service by zone for FONATEL's Connected Communities Programme, 2016-2017



Source: SUTEL, General Directorate for FONATEL.

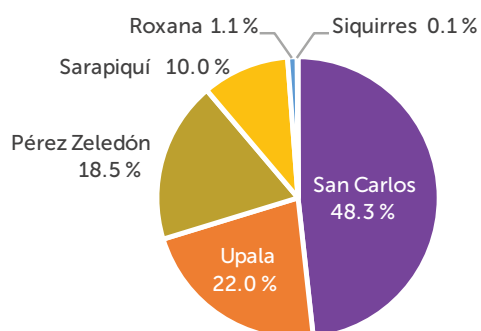
Gráfico N° 170
Costa Rica. Percentage of subscriptions to fixed telephony services provided by FONATEL's Connected Communities Programme, by project, 2016-2017



Source: SUTEL, General Directorate for FONATEL.

Graph N° 171

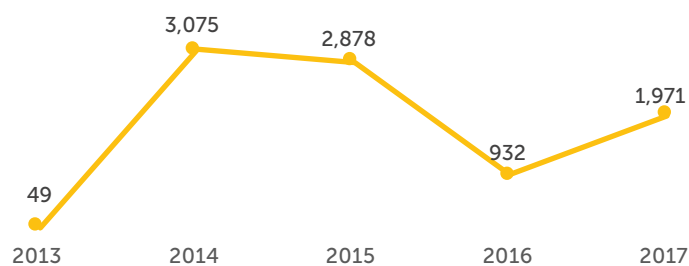
Costa Rica. Percentage of subscriptions to internet access services provided by FONATEL's Connected Communities Programme, by project, 2017



Source: SUTEL, General Directorate for FONATEL.

Graph N° 172

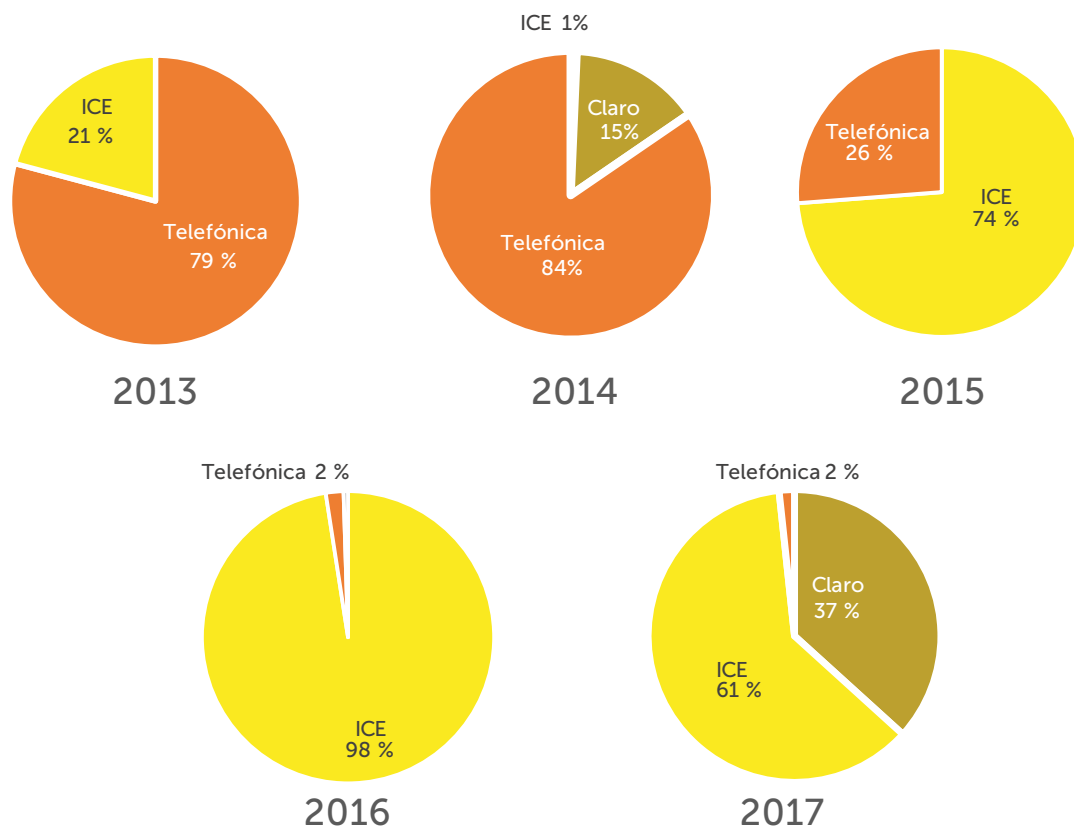
Costa Rica. FONATEL's investment through Connected Communities Programme, 2013 – 2017
(Data in millions of colones)



Source: SUTEL, General Directorate for FONATEL.

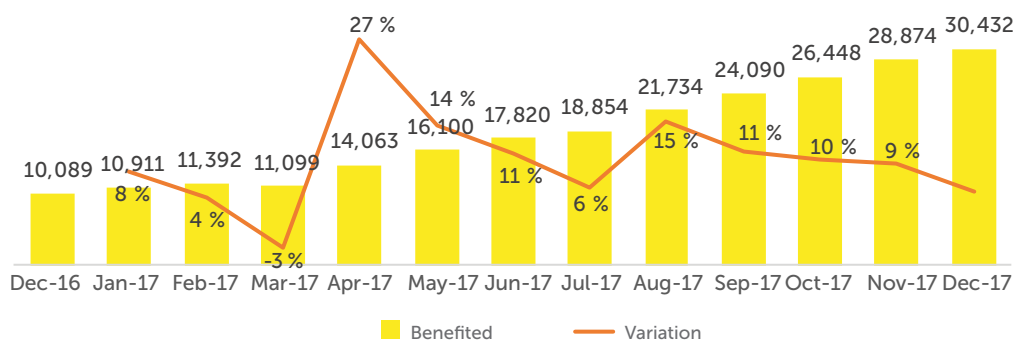


Graph N° 173
Costa Rica. Investment executed through FONATEL's Connected Communities Programme, by operator, 2013-2017



Source: SUTEL, General Directorate for FONATEL.

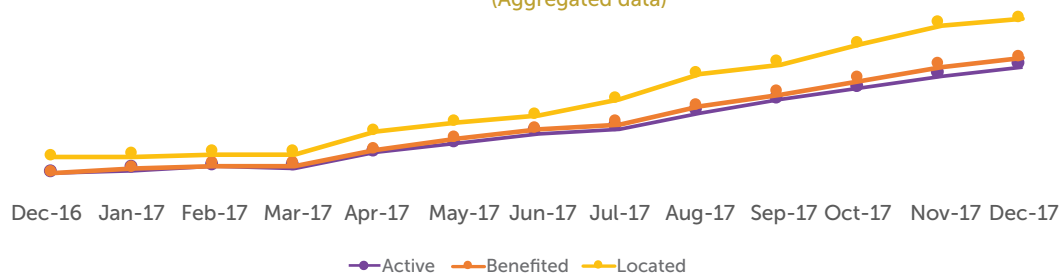
Graph N° 174
Costa Rica. Total amount of households benefited through FONATEL's Connected Communities Programme, 2016 – 2017
(Aggregated data from beneficiaries and percentage change)



Source: SUTEL, General Directorate for FONATEL.

30,432
households with their own Internet connection and portable computer, subsidized by FONATEL.

Graph N° 175
Costa Rica. Total amount of households attended through FONATEL's
Connected Households Programme, by state, 2016 -2017
(Aggregated data)



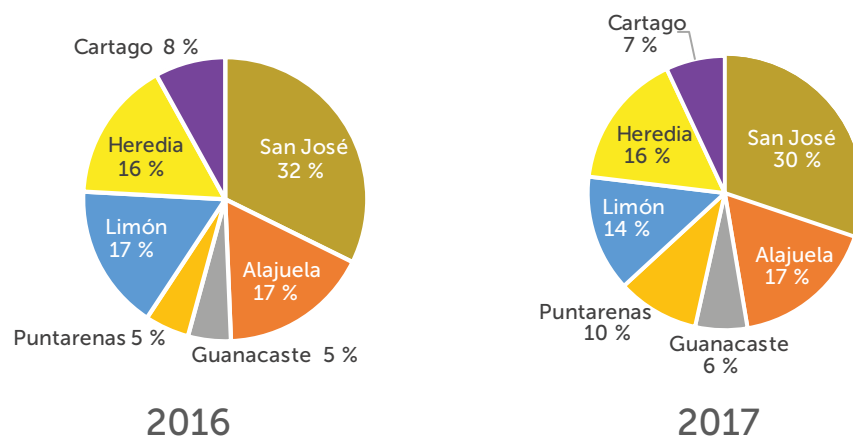
Source: SUTEL, General Directorate for FONATEL.

Table N° 39
Costa Rica. Number of benefited households through FONATEL's Connected
Households Programme, by province, 2016-2017

| Province | dec-16 | jan-17 | feb-17 | mar-17 | apr-17 | may-17 | jun-17 | jul-17 | aug-17 | sep-17 | oct-17 | nov-17 | dec-17 |
|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| San José | 3,259 | 3,791 | 3,907 | 3,774 | 4,756 | 5,295 | 5,791 | 6,088 | 6,913 | 7,413 | 8,232 | 8,865 | 9,178 |
| Alajuela | 1,721 | 1,974 | 2,044 | 1,988 | 2,460 | 2,977 | 3,288 | 3,392 | 3,796 | 4,119 | 4,440 | 4,868 | 5,229 |
| Cartago | 492 | 576 | 583 | 567 | 737 | 859 | 1,001 | 1,081 | 1,231 | 1,410 | 1,665 | 1,758 | 1,872 |
| Heredia | 510 | 442 | 471 | 443 | 893 | 1,290 | 1,539 | 1,603 | 2,052 | 2,241 | 2,444 | 2,758 | 2,942 |
| Guanacaste | 1,672 | 1,845 | 1,904 | 1,804 | 2,175 | 2,310 | 2,492 | 2,755 | 3,156 | 3,576 | 3,774 | 4,073 | 4,186 |
| Puntarenas | 1,624 | 1,543 | 1,718 | 1,720 | 2,083 | 2,304 | 2,537 | 2,671 | 3,158 | 3,742 | 4,121 | 4,563 | 4,904 |
| Limón | 812 | 740 | 765 | 803 | 959 | 1,065 | 1,172 | 1,264 | 1,428 | 1,589 | 1,772 | 1,989 | 2,121 |
| Total | 10,089 | 10,911 | 11,392 | 11,099 | 14,063 | 16,100 | 17,820 | 18,854 | 21,734 | 24,090 | 26,448 | 28,874 | 30,432 |

Source: SUTEL, General Directorate for FONATEL.

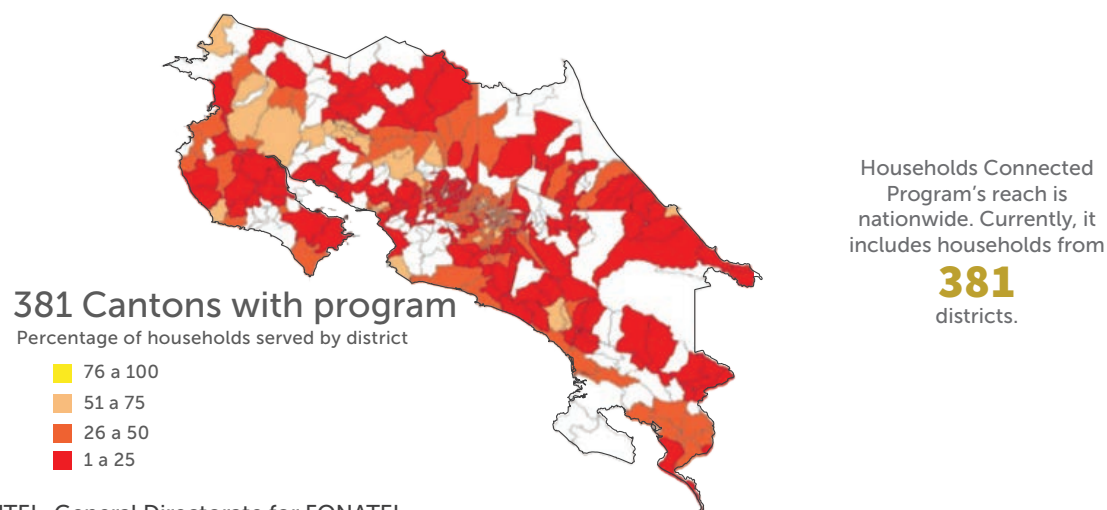
Graph N° 176
Costa Rica. Percentage of benefited households through FONATEL's Connected
Households Programme, by province, 2016-2017



Source: SUTEL, General Directorate for FONATEL.

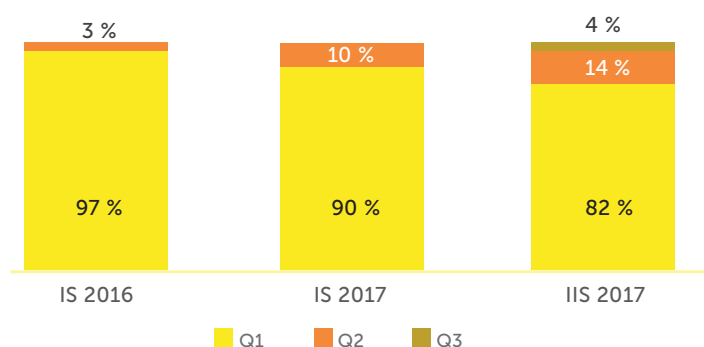


Figure N° 12
Costa Rica. Concentration by district of benefited households of FONATEL's
Connected Households Programme, 2017



Source: SUTEL, General Directorate for FONATEL.

Graph N° 177
Costa Rica. Percentage of benefited households through FONATEL's Connected
Households Programme, by wealth quintile, 2016-2017



82 %
of the benefited households with the Program are below the poverty line or in extreme poverty.

Source: SUTEL, General Directorate for FONATEL.

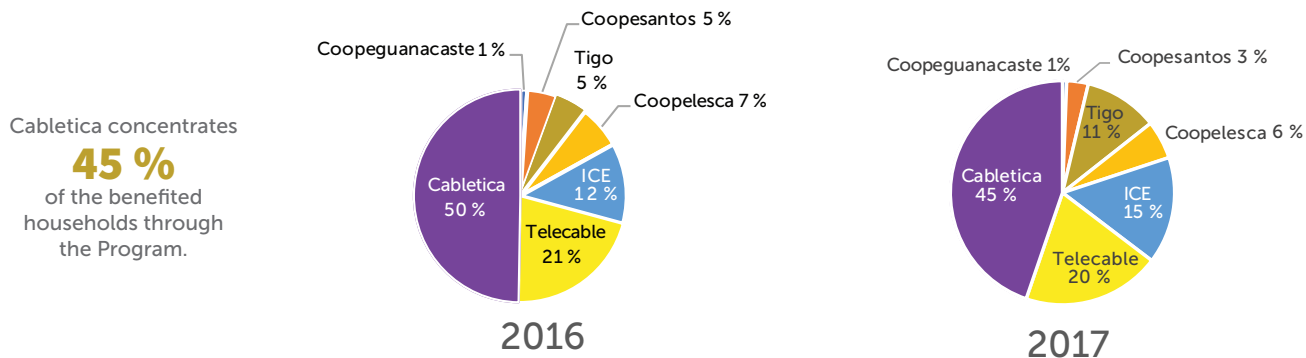
Table N° 40
Costa Rica. Number of benefited households through FONATEL's Connected
Households Programme, by wealth quintile, 2016-2017

| Wealth quintile | dec-16 | jan-17 | feb-17 | mar-17 | apr-17 | may-17 | jun-17 | jul-17 | aug-17 | sep-17 | oct-17 | nov-17 | dec-17 |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Quintile 1 | 9,832 | 10,631 | 11,095 | 11,099 | 13,161 | 14,625 | 16,012 | 16,847 | 18,884 | 20,545 | 22,218 | 23,896 | 24,995 |
| Quintile 2 | 256 | 279 | 296 | 0 | 901 | 1,474 | 1,807 | 1,982 | 2,414 | 2,854 | 3,305 | 3,920 | 4,283 |
| Quintile 3 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 25 | 436 | 691 | 925 | 1,058 | 1,154 |
| Total | 10,089 | 10,911 | 11,392 | 11,099 | 14,063 | 16,100 | 17,820 | 18,854 | 21,734 | 24,090 | 26,448 | 28,874 | 30,432 |

Source: SUTEL, General Directorate for FONATEL.

Graph N° 178

Costa Rica. Percentage of benefited households through FONATEL's Connected Households Programme, by telecommunication services supplier, 2016-2017



Source: SUTEL, General Directorate for FONATEL.

Table N° 41

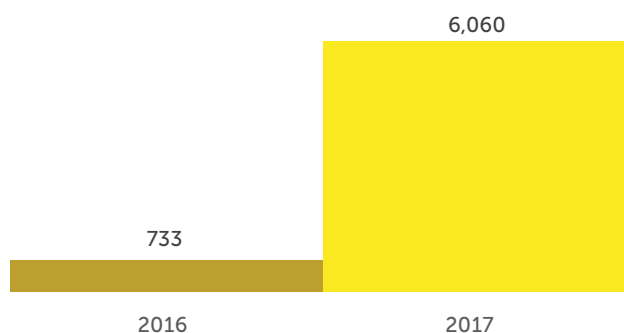
Costa Rica. Variation of total households benefited through FONATEL's Connected Households Programme, by telecommunications services supplier, 2016-2017

| Supplier | 2016 | Porcentaje | 2017 | Porcentaje | Variación |
|-----------------|-------|------------|--------|------------|-----------|
| Coopeguanacaste | 106 | 1 % | 184 | 1 % | 0 % |
| Coopesantos | 458 | 5 % | 948 | 3 % | -1 % |
| Tigo | 488 | 5 % | 3,243 | 11 % | 6 % |
| Coopesca | 658 | 7 % | 1,686 | 6 % | -1 % |
| ICE | 1,237 | 12 % | 4,694 | 15 % | 3 % |
| Telecable | 2,124 | 21 % | 6,059 | 20 % | -1 % |
| Cabletica | 5,018 | 50 % | 13,618 | 45 % | -5 % |

Source: SUTEL, Direction General for FONATEL.

Graph N° 179

Costa Rica. Investment executed through FONATEL's Connected Households Programme, 2016-2017
(Data in millions of colones)

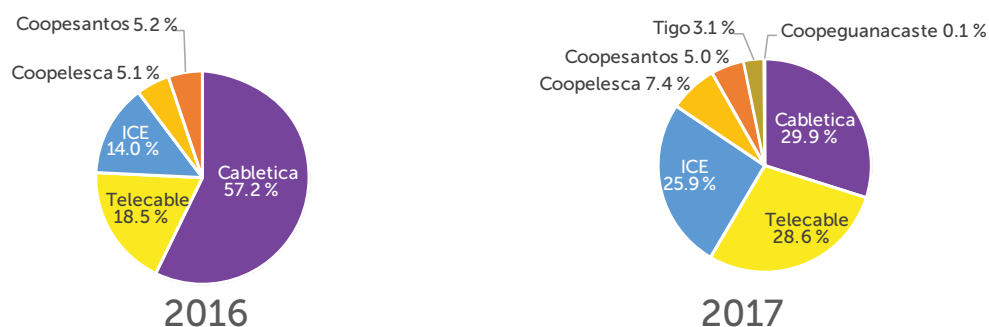


Source: SUTEL, General Directorate for FONATEL.



Graph N° 180

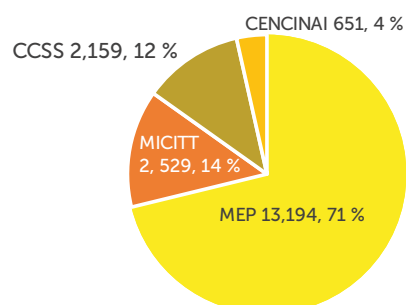
Costa Rica. Percentage of investment executed through FONATEL's Connected Households Programme, by telecommunications services supplier, 2016-2017



Source: SUTEL, General Directorate for FONATEL.

Graph N° 181

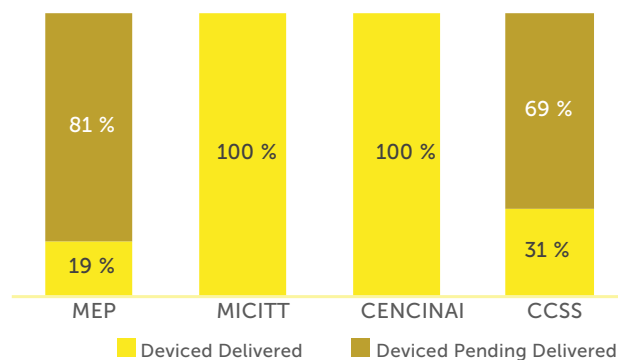
Costa Rica. Quantity and percentage of equipment required for FONATEL's Connected Public Centres Programme, 2017



Source: SUTEL, General Directorate for FONATEL.

Graph N° 182

Costa Rica. Percentage of equipment delivered and installed for FONATEL's Connected Public Centres Programme, 2017



Source: SUTEL, General Directorate for FONATEL.

Table N° 42

Costa Rica. Number of devices provided and delivery pending according to goals of FONATEL's Connected Public Centers Programme, 2017

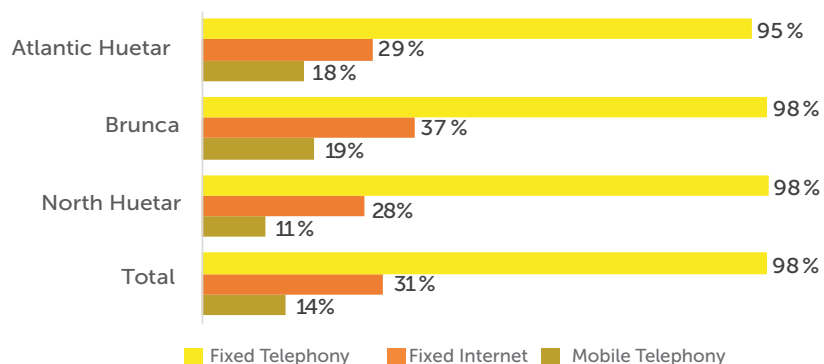
6,407
equipments delivered to
public institutions to build
broadband technological
solutions.

| Institution | Projected equip-ment | Delivered equipment | Pending equipment |
|--------------|----------------------|---------------------|-------------------|
| MEP | 13,194 | 2,566 | 10,628 |
| MICITT | 2,529 | 2,529 | 0 |
| CENCINAI | 651 | 651 | 0 |
| CCSS | 2,159 | 661 | 1,498 |
| Total | 18,533 | 6,407 | 12,126 |

Source: SUTEL, General Directorate for FONATEL.

Graph N° 183

Costa Rica. Percentage of Subscriptions to Telecommunication Services in the Regions Covered through the Connected Communities Program of FONATEL, by Type of Service, 2018



Source: SUTEL, General Directorate for FONATEL.



Table N° 43
Costa Rica. Main uses of the Internet access service in the regions covered by the Connected Communities Program of FONATEL, 2018

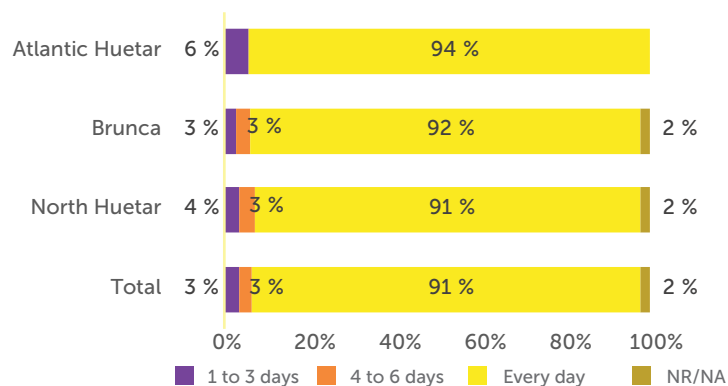
| Use | Percentage | | | |
|--|------------|--------------|--------|-----------------|
| | Total | North Huetar | Brunca | Atlantic Huetar |
| Social networks (use of Facebook, Skype, etc.) | 49 % | 50 % | 50 % | 43 % |
| Study (research, online courses, etc.) | 42 % | 46 % | 40 % | 31 % |
| Email | 34 % | 35 % | 32 % | 40 % |
| Download information | 29 % | 31 % | 29 % | 20 % |
| Communication (calls, video calls) | 25 % | 27 % | 23 % | 29 % |
| Listen to music | 22 % | 20 % | 24 % | 23 % |
| Read news | 21 % | 22 % | 19 % | 31 % |
| Watch movies | 18 % | 15 % | 22 % | 17 % |
| Play | 12 % | 12 % | 13 % | 17 % |
| Work | 12 % | 13 % | 12 % | 3 % |
| Bank transactions | 12 % | 10 % | 13 % | 14 % |
| Others | 19 % | 17 % | 20 % | 31 % |

49 %
of the interviewed households use Internet service for social networks.

Note: the table includes the results associated with the planning regions covered or intervened through the Connected Communities Program.

Source: SUTEL, General Directorate for FONATEL.

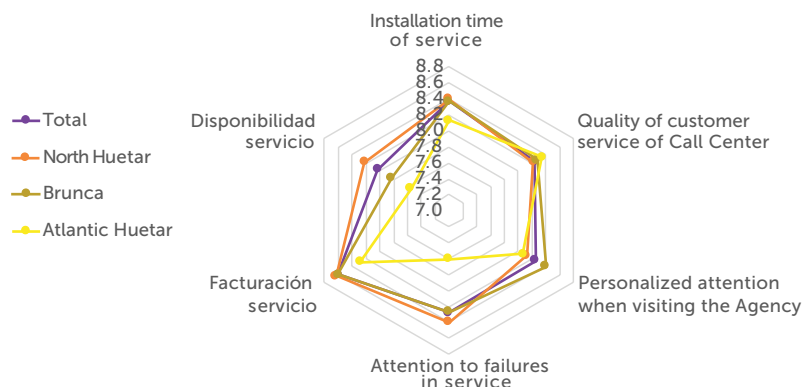
Graph N° 184
Costa Rica. Percentage of Use of the Internet Access Service in the Regions Covered by the Connected communities Programs of FONATEL, per range of days used, 2018



Source: SUTEL, General Directorate for FONATEL.

Graph N° 185

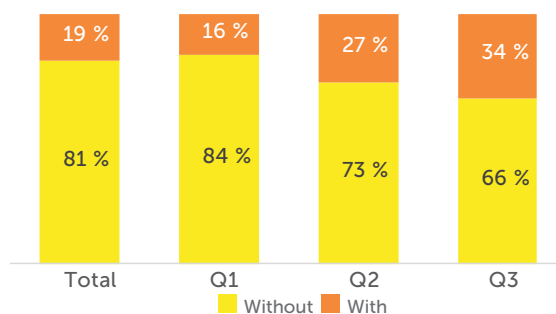
Costa Rica. Evaluation of Telecommunication Services offered on the Regions Covered by the Connected Communities Program of FONATEL, 2018



Source: SUTEL, General Directorate for FONATEL.

Graph N° 186

Costa Rica. Percentage of Households without a Computer and Internet before the Intervention through the Connected Homes Program of FONATEL, 2018

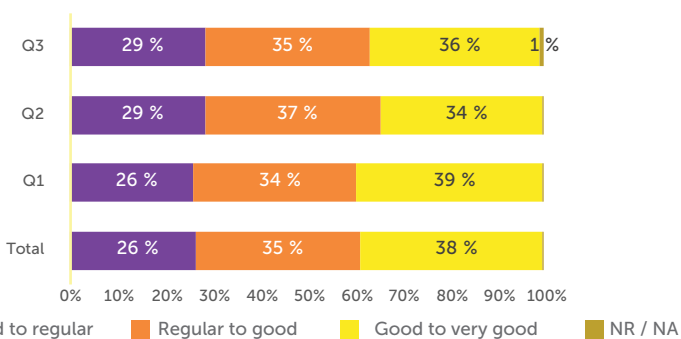


Source: SUTEL, General Directorate for FONATEL.

Graph N° 187

Costa Rica. Assessment of Households of the Speed of Subsidized Internet Service through the Connected Homes Program of FONATEL, 2018

38 %
of the households describe the speed of Internet service subsidized by Connected Homes Program "good" or "very good".

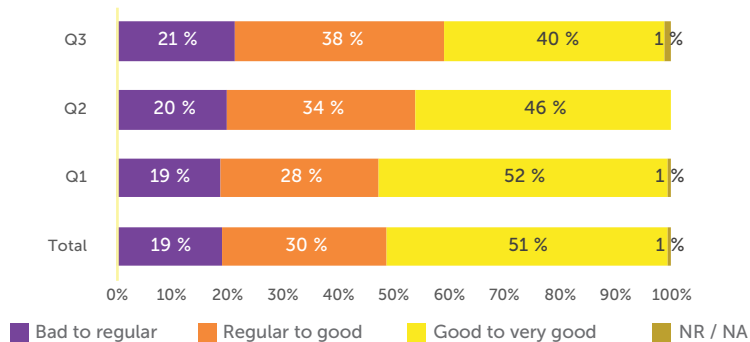


Source: SUTEL, General Directorate for FONATEL.



Graph N° 188

Costa Rica. Assessment of Households of the Continuity of Subsidized Internet Service through the Connected Homes Program of FONATEL, 2018



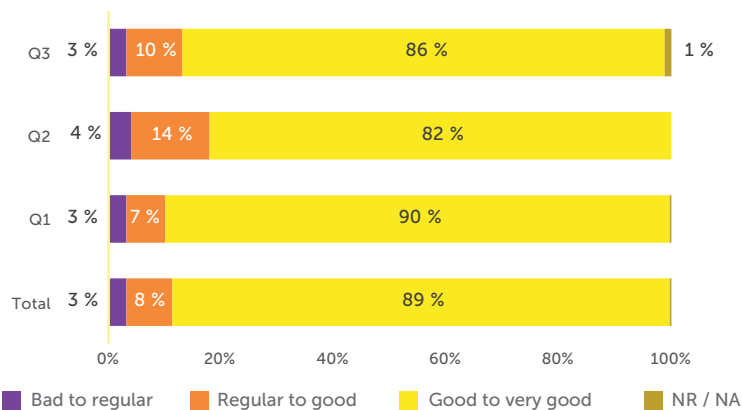
51 %

of the households describe the continuity of Internet service subsidized by Connected Homes Program as "good" or "very good".

Source: SUTEL, General Directorate for FONATEL.

Graph N° 189

Costa Rica. Assessment of Households of the Laptop Subsidized through the Connected Homes Program of FONATEL, 2018



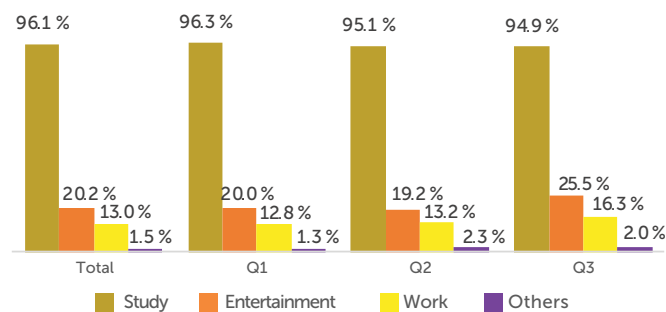
89 %

of the households describe laptops subsidized by Connected Homes Program as "good" or "very good".

Source: SUTEL, General Directorate for FONATEL.

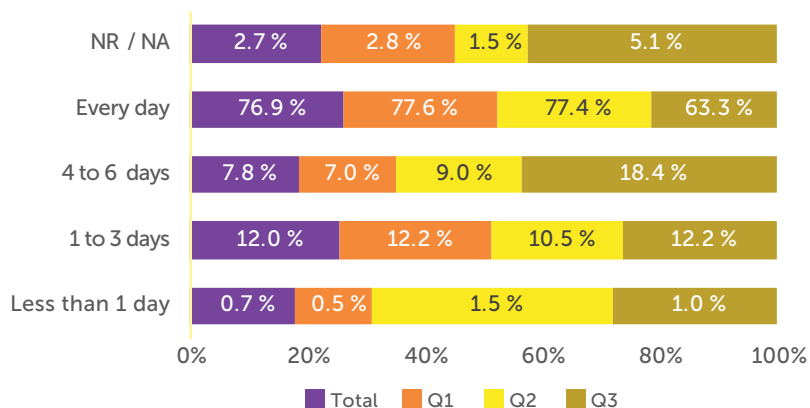
Graph N° 190

Costa Rica. Main Uses of the Laptop Subsidized through the Connected Homes Program of FONATEL, 2018



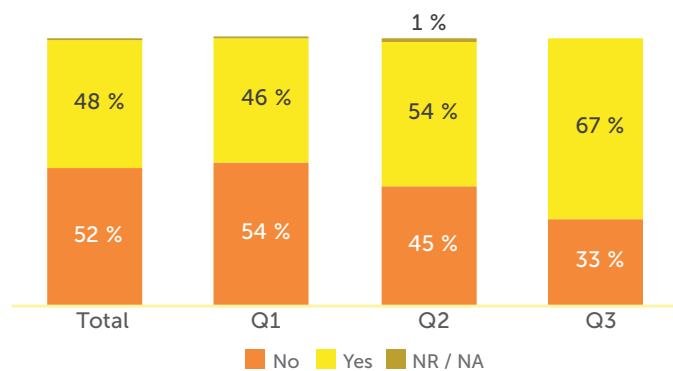
Source: SUTEL, General Directorate for FONATEL.

Graph N° 191
Costa Rica. Percentage of Use of Subsidized Internet Access through the Connected Homes Program per ranges of days of use, 2018



Source: SUTEL, General Directorate for FONATEL.

Graph N° 192
Costa Rica. Percentage of Benefited Houses through the Connected Homes Program who are Trained in the Use of the Computer, 2018



Source: SUTEL, General Directorate for FONATEL.



INTERNATIONAL





INTERNATIONAL

Costa Rica remains among the countries with the highest mobile penetration, reaching the first position in 2016 in Latin America, with 171,5 % according to the estimates of the ITU, and surpassing countries such as Singapore, Finland, Switzerland and other European countries.

This section aims to analyze the position of Costa Rica in the global context regarding the development of telecommunications. This is an analysis of the behavior of different services in the international arena and the possible trends that may arise in the context of such behavior in the near future.

For this analysis, the following sections will be developed:

- Analysis of general international indicators
- Analysis of the Global Competitiveness Index

At the time of this report, the International Telecommunications Union (ITU) did not yet have public information for 2017, so it was not feasible to include this information in this edition. Instead, figures for 2016 are used, taking the ITU data as a source of information.

Analysis of General International Indicators

This analysis seeks to know the position of Costa Rica in the most outstanding general indicators with respect to

the leading countries in telecommunications and Latin American countries.

The services of fixed telephony, mobile telephony, access to fixed and mobile Internet are analyzed, especially regarding the evolution of the number of subscribers and their total penetration, as well as the relative weight of telecommunications revenues in relation to the GDP.

The penetration of fixed telephony (traditional basic telephony and VoIP telephony), measured as the percentage of total users with respect to the total population of the country, has shown, in general, a decrease in recent years. This situation is not unique to Costa Rica as the number of subscriptions to this service continues to decrease also in countries such as Switzerland, Norway, Sweden and the United States. According to the records of the ITU, in 2016, they reached 47.2 %; 15.3 %; 31.6 % and 37.7 %, respectively. In the case of Costa Rica, the penetration in 2016 was 17.5 %; while in 2017 it was reduced by 15.1 %, placing the country in a very similar situation to that of Norway ([see graph N° 193](#)).

In the case of mobile telephony service, Costa Rica remains among the countries with the highest penetration, reaching the first position, worldwide, in 2016, with 171.5 %¹. This

¹ This figure corresponds to the calculation of the ITU, which, unlike that calculated by SUTEL, uses the population estimated by the UNDP, in contrast to that of the SUTEL, which belongs to the INEC.



means, the country surpassed countries such as Singapore, Finland, Switzerland and other European countries. It should be noted that the percentage of penetration reached in 2017 (179 %) is consistent with the tendency to remain at the top of this penetration indicator, as can be seen on [graph N° 194](#).

Regarding the form of payment, in the case of prepayment, Costa Rica has one of the highest values (133.2 %), only surpassed by El Salvador (139.7 %). These high values are frequent in Latin American countries, while in countries like Singapore, Switzerland, and the United Kingdom the values are 60.7 %, 46.5% and 44.8 %, respectively. In the case of the postpaid telephony, the values are far from the prepaid modality, where Costa Rica is in the third position (38.2 %), surpassed by Uruguay (52.2 %) and Chile (47.8 %) ([see graph N° 195](#) and [N° 196](#)).

According to payment method, the proportion of prepaid subscriptions decreased by 1 % in the case of mobile telephony service. However, Costa Rica continues to be among the countries with the highest proportion of prepaid lines, second only to Colombia, Mexico, Panama and Nicaragua. These results contrast with those observed in European and Asian countries, where the relationship is inverse, as shown on [graph N° 197](#).

As it happened in the previous edition of the Statistics of the telecommunications sector, Costa Rica 2016, is still showing an inverse relationship between the proportion of prepaid services and per capita income, according to the data of the ITU Report for 2016. Mobile telephony users from countries with a higher level of development and greater purchasing power choose, for the most part, for postpaid services; while countries with lower purchasing power opt for prepaid services. The detail can be seen on [graph N° 198](#).

For Costa Rica, the measurement of the level of fixed Internet access per 100 inhabitants (15 %) was slightly higher than the value reached the previous year (13.1 %). Although this indicator is higher to those registered by most Latin American countries in this comparative sample, this result is lower than that achieved in Chile (16.2 %), Argentina (16.5 %) and Uruguay (26.8 %). If the comparison is made with European countries, in particular Switzerland, Denmark, Holland and Norway, the values registered

in such countries, in general, triplicate those values reached by Costa Rica. The detail can be seen on [graph N° 199](#).

In the case of the penetration of fixed Internet subscriptions with speeds of 2 Mbps to less than 10 Mbps, the dynamics are changing in relation to the total penetration of fixed Internet. Costa Rica ranks third in Latin America (7.7 %), surpassed by Argentina (12.9 %) and Colombia (9.1 %), and Uruguay, that did not report this indicator to ITU. On the other hand, Costa Rica behaves similarly to Switzerland (7.4 %) and Norway (7.2 %). The detail can be seen on [graph N° 200](#).

The percentage of mobile penetration reached in 2017 is in accordance to the trend to place the country in the first ranks at the global level in the next years.

Contrary to what happens with fixed Internet access, mobile Internet in Costa Rica continues to show a relatively high position within the countries evaluated. In fact, the index calculated for 2016 (86 %) is only surpassed at the Latin American level by Uruguay (101.9 %) and Brazil (88.5 %). In Asia and Europe, it is led by Finland (152.3 %), Singapore and other Nordic countries (Sweden, Denmark and Norway). If the figure for 2017 (97 %) is considered, Costa Rica's position increases, but it is comparable with that of the developed countries included in the sample analyzed. The detail can be seen on [graph N° 201](#).

Finally, the relative weight of telecommunications revenues in relation to the Gross Domestic Product (GDP) in dollars for each country is quantified. Using the most up-to-date data on telecommunications revenues available from ITU (2016), in the case of Costa Rica, the value is 2.9 %, surpassed by Colombia, Korea and the EU with 4.3 %, 3.8 % and 3.3 %, respectively. For European countries, the behavior is discreet, with values ranging between 2.3 % and 1.1 %. The respective detail can be seen on [graph N° 202](#).



Analysis of the Global Competitiveness Index

The Global Competitiveness Index is prepared by the World Economic Forum. In this section we will analyze the position of Costa Rica within that index, as well as focus the country's results in its ninth pillar: technological preparation.

The Global Competitiveness Index measures the ability of countries to provide high levels of prosperity to their citizens. In this sense, this ability depends on the level at which a country uses its available resources productively. Consequently, the index measures a set of institutions, policies and factors that define the levels of sustainable economic prosperity in the present and in the medium term.

The index is calculated using public information from different institutions and the Executive Opinion Survey conducted by the World Economic Forum in conjunction with a network of partner institutes (which includes leading research institutions and business organizations²) in the countries included in the report. In 2017 more than 12,000 business leaders were interviewed in the 137 countries included in the calculation. The survey is designed to capture a wide range of factors that affect the business climate within a country's economy. The index results in scores that range between 1 and 7, where 7 is the highest score that a country can obtain and, therefore, greater degree of global competitiveness.

The pillar of technology preparation measures the agility with which an economy adopts existing technologies to improve the productivity of its industries, with specific emphasis on its ability to take full advantage of information and communication technologies (ICT) in daily activities and production processes for increase efficiency and competitiveness. Whether the technology used has developed or not within national borders is irrelevant to its ability to improve productivity. The central point is that companies operating in the country need access to advanced products and services, including the ability to absorb and use them.

This section focuses on the previously described pillar. As evidenced on [table N° 44](#), the variables used in the calculation of the pillar related to technological preparation include indicators calculated and captured by the SUTEL.

In relation to the performance of the Global Competitiveness Index for Costa Rica, we can see [graph N° 203](#) for 2017, which shows the highest score compared to the last four years, when it increased from 4.34 in 2016, to 4.50 in the year 2017. This shows an improvement in the country's competitiveness. In this regard, five positions have been advanced, reaching 47th out of 137 countries evaluated.

In Latin America, Costa Rica is in position 3, surpassed only by Chile, with a score of 4.7. Costa Rica is above countries like Mexico, Colombia, Uruguay, Brazil and Argentina, among others. The detail can be seen on [graph N° 204](#).

For the pillar of technological preparation, Costa Rica is in the 45th position out of 137 countries in the year 2017. Although it does not scale positions compared to 2016, it stands out that the score increased to 4.9, the most high obtained in the last 5 years. In Latin American countries, Costa Rica is in position 3, surpassed by Chile and Uruguay, with scores of 5.3 and 5.2, respectively. This difference is due to the fact that these countries have higher scores in the following indicators: percentage of users with Internet, fixed broadband Internet subscriptions per hundred inhabitants and Internet bandwidth in kb per user. The detail can be seen on [graph N° 206](#).

² In the case of Costa Rica, INCAE Business School is the Institution responsible for coordinating annually the development of the Executive Opinion Survey (EOE) of the World Economic Forum in 7 countries of Latin America, namely: Honduras, El Salvador, Nicaragua, Costa Rica, Panama, Dominican Republic, Ecuador and Bolivia.

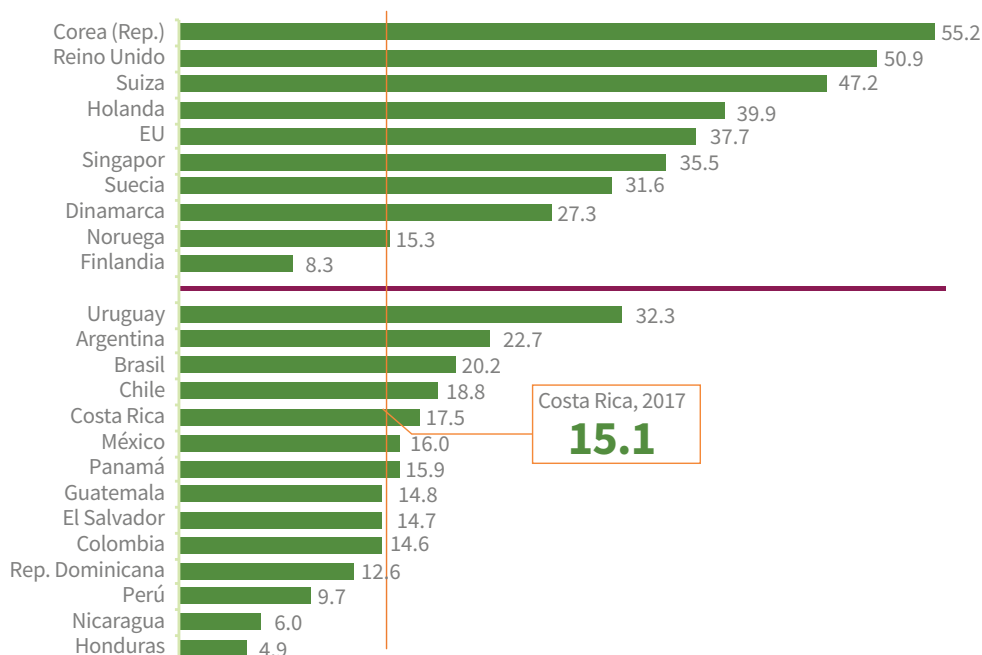


Table N° 44
Costa Rica. Ninth pillar: Technological Preparation,
components, 2017

| Code | Variables | Position (Worldwide) |
|------|--|----------------------|
| 9.01 | Availability of the latest technologies | 46 |
| 9.02 | Absorption of technology at the company level | 40 |
| 9.03 | Direct foreign investment and technology transfer | 19 |
| 9.04 | Users of Internet (%) | 59 |
| 9.05 | Subscriptions to fixed broadband Internet / 100 pop. | 65 |
| 9.06 | Internet bandwidth kbps / user | 60 |
| 9.07 | Subscriptions of mobile broadband / 100 pop. | 15 |

Source: SUTEL, General Directorate for Markets, with information from the World Economic Forum.

Graph N° 193
Subscriptions to the fixed telephony service ¹ per one
hundred inhabitants, 2016

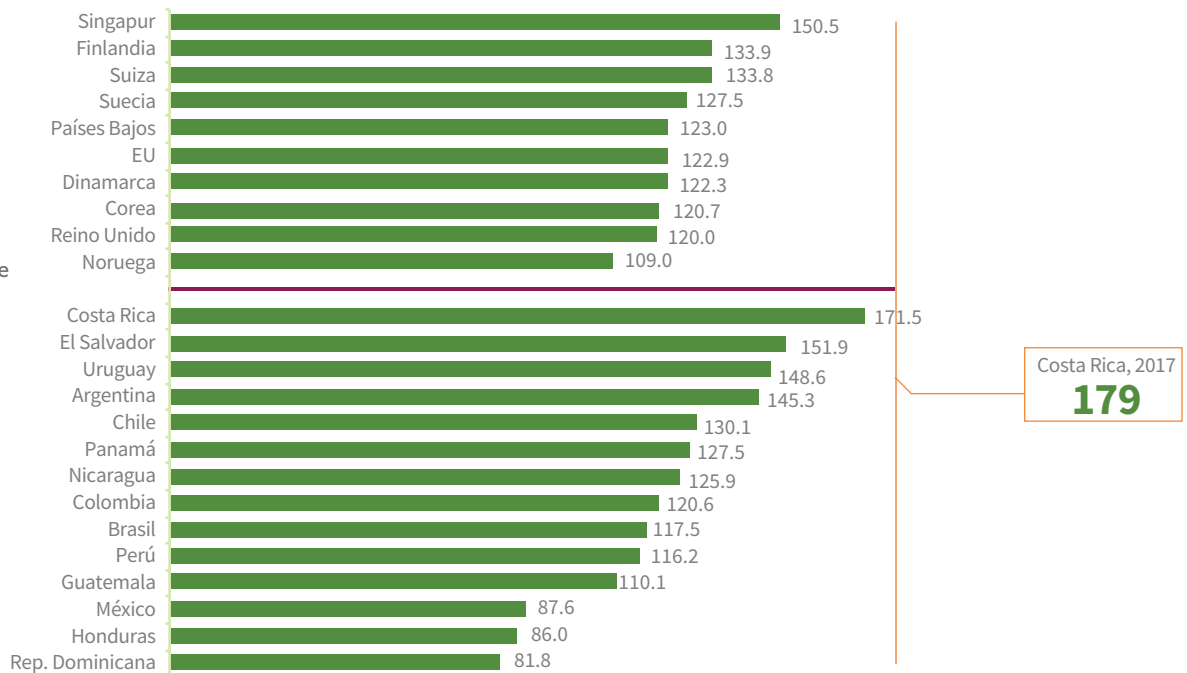


Source: SUTEL, General Directorate for Markets, with information from the ¹ITU includes subscriptions of traditional fixed telephony and VoIP telephony.



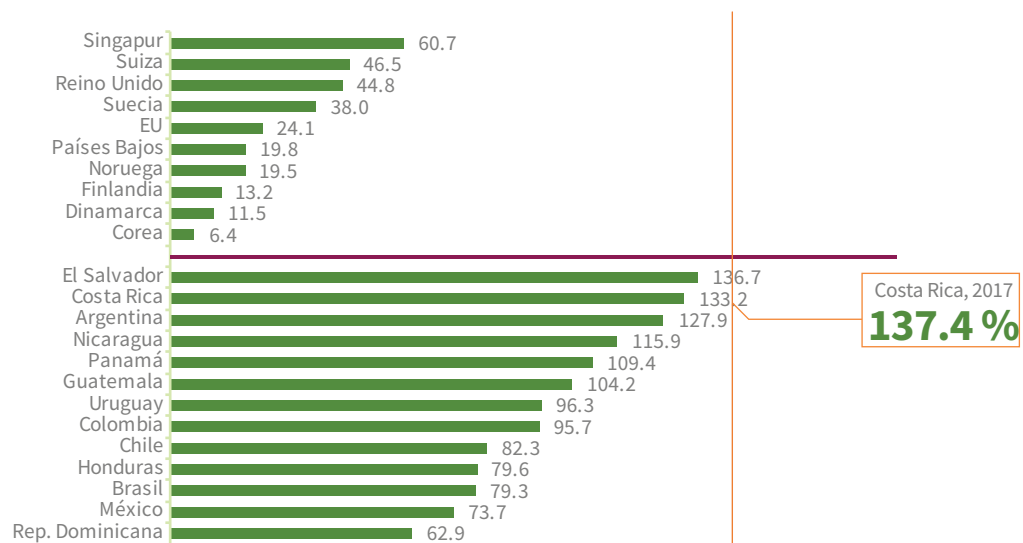
Costa Rica leads in
terms
of penetration of mobile
services.

Graph N° 194
Subscriptions to the mobile telephony service per
one hundred inhabitants, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU.

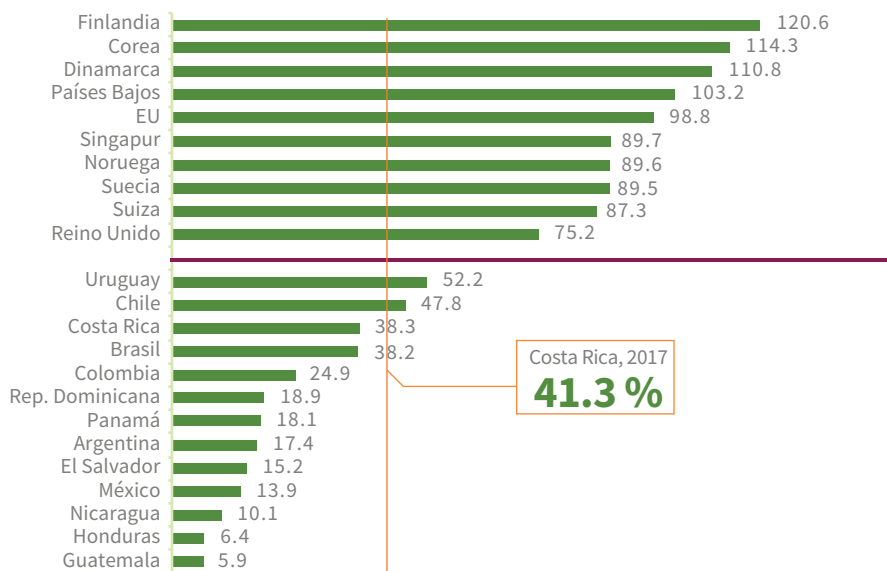
Graph N° 195
Subscriptions to prepaid mobile telephony service
per one hundred inhabitants, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU.

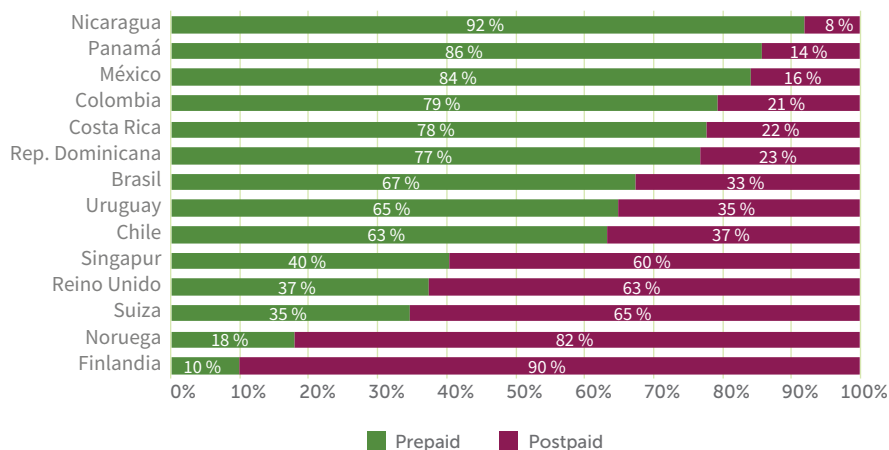


Graph N° 196
Subscription to postpaid mobile telephony service
per one hundred inhabitants, 2016



Source: SUTEL, General Directorate for Markets, with information from ITU.

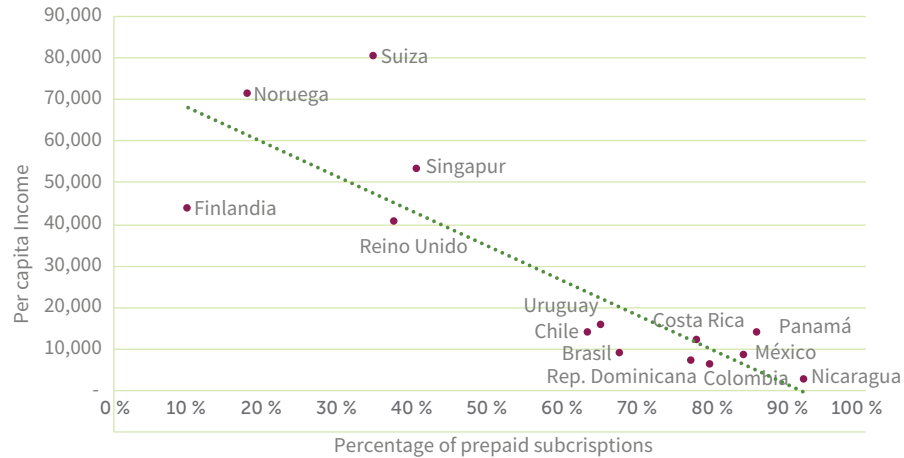
Graph N° 197
Distribution of the percentage of mobile
subscriptions between postpaid and prepaid, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU.

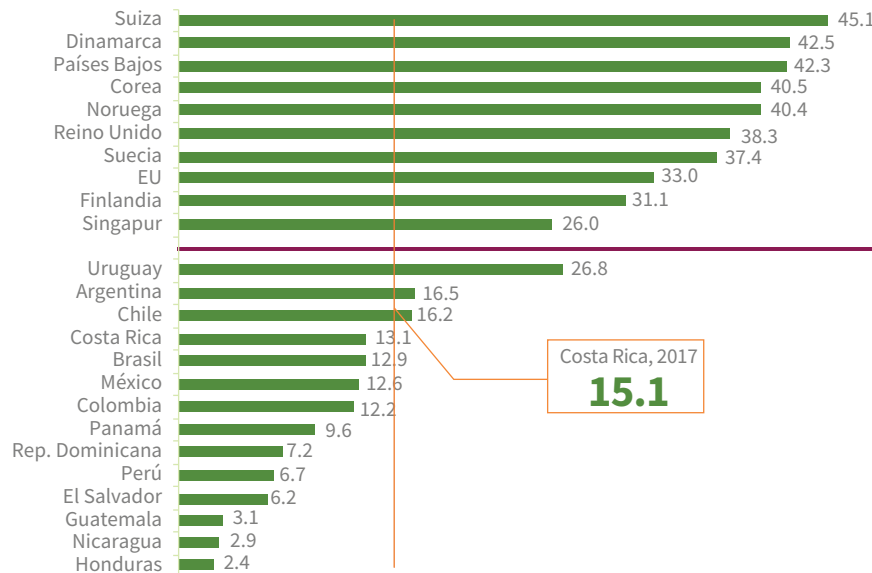


Graph N° 198
Average income per inhabitant and percentage of
prepaid subscriptions, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU. Purchasing power parity is not considered.

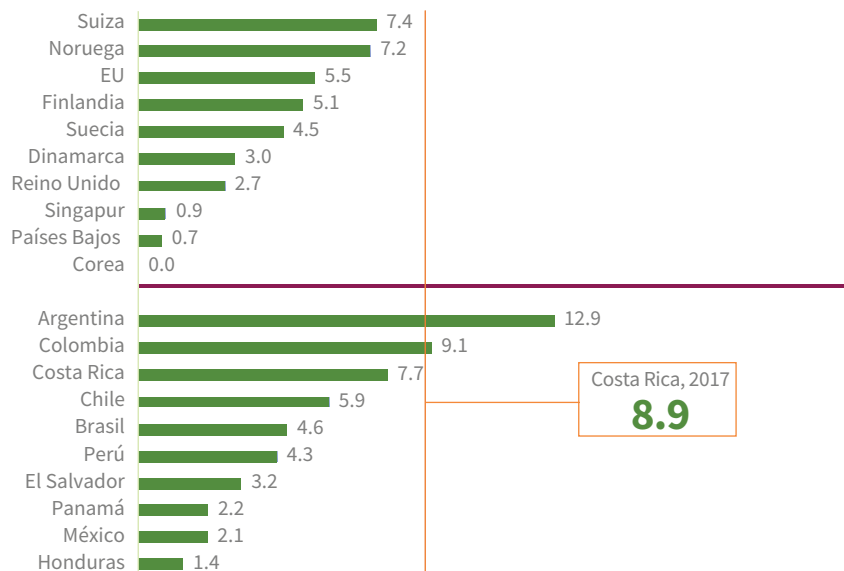
Graph N° 199
Penetration of fixed Internet access per hundred
inhabitants, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU.

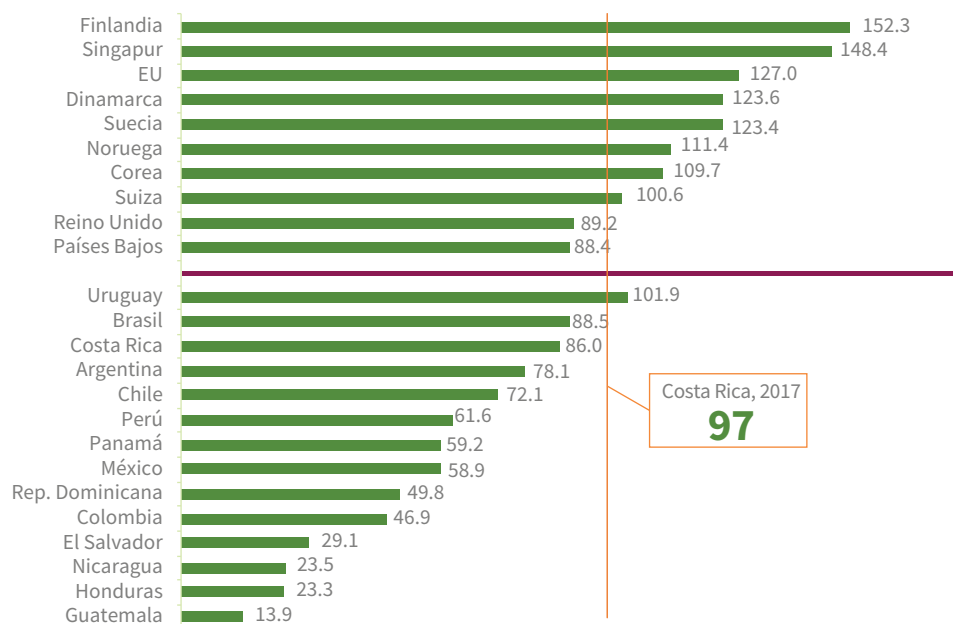


Graph N° 200
Penetration of fixed Internet access from 2 Mbps
subscriptions to less than 10 Mbps per hundred
inhabitants, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU.

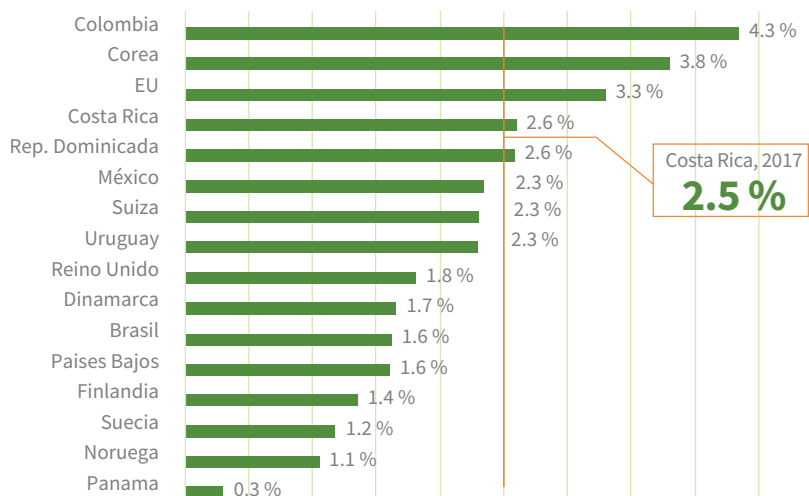
Graph N° 201
Penetration of mobile Internet access per hundred
inhabitants, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU.



Graph N° 202
Reason for the total income of the
telecommunications sector compared to GDP, 2016



Source: SUTEL, General Directorate for Markets, with information from the ITU. Purchasing power parity is not considered.

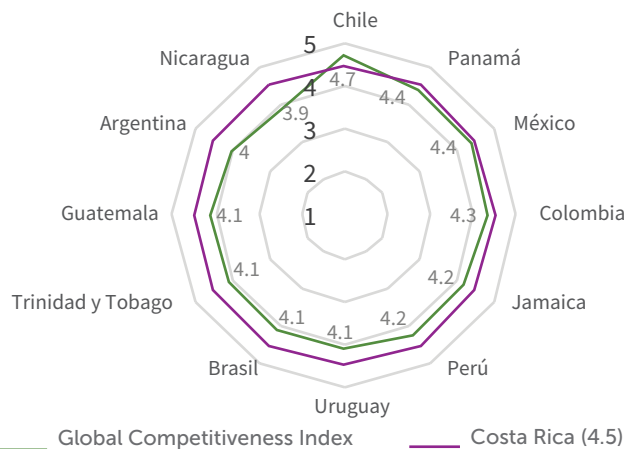
Graph N° 203
Costa Rica. Global Competitiveness Index, position
worldwide and score. 2013-2017



Source: SUTEL, General Directorate for Markets, with information from the World Economic Forum.

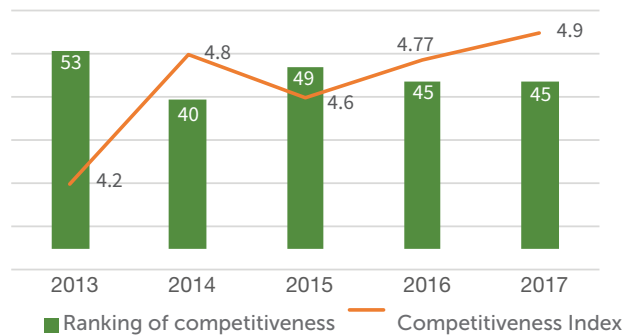


Graph N° 204
Global Competitiveness Index: Value obtained according to the countries of Latin America. 2017



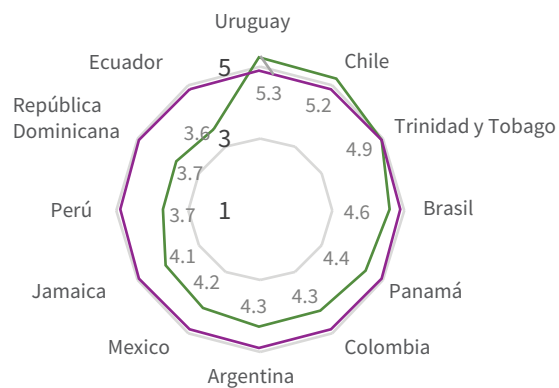
Source: SUTEL, General Directorate for Markets, with information from the World Economic Forum.

Graph N° 205
Costa Rica. Global Competitiveness Index, pillar of technological preparation, global position and value. 2013-2017



Source: SUTEL, General Directorate for Markets, with information from the World Economic Forum.

Graph N° 206
Technological preparation: score obtained according to Latin America countries, 2017



Source: SUTEL, General Directorate for Markets, with information from the World Economic Forum.



STATISTICAL ANNEX





STATISTICAL ANNEX

GENERAL EVOLUTION OF THE SECTOR

Table N° 45
Costa Rica. Total income of the telecommunications sector, 2013 - 2017
(Quarterly and annual figures in million colones)

| Indicator | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | | |
|-----------------|-------------|--------------|---------------|--------------|-------------|--------------|---------------|--------------|-------------|--------------|---------------|--------------|-------------|--------------|---------------|--------------|-------------|--------------|---------------|--------------|
| | I T 2013 | II T 2013 | III T 2013 | IV T 2013 | I T 2014 | II T 2014 | III T 2014 | IV T 2014 | I T 2015 | II T 2015 | III T 2015 | IV T 2015 | I T 2016 | II T 2016 | III T 2016 | IV T 2016 | I T 2017 | II T 2017 | III T 2017 | IV T 2017 |
| Million colones | 133,856 | 140,012 | 148,801 | 154,074 | 178,789 | 182,611 | 176,614 | 180,477 | 184,637 | 190,825 | 187,380 | 189,322 | 187,157 | 191,934 | 197,219 | 198,549 | 198,552 | 201,093 | 201,279 | 206,372 |
| Variation rate | 6% | 2% | 2% | 2% | 3% | 5% | 6% | 4% | 16% | 2% | -3% | 2% | 2% | 3% | -2% | 1% | 0% | 0% | 0% | 0% |

Source: SUTEL, General Directorate for Markets.

Table N° 46
Total income of the telecommunications sector according to service, 2013 - 2017
(Quarterly figures in million colones)

| | I T 2013 | II T 2013 | III T 2013 | IV T 2013 | I T 2014 | II T 2014 | III T 2014 | IV T 2014 | I T 2015 | II T 2015 | III T 2015 | IV T 2015 | I T 2016 | II T 2016 | III T 2016 | IV T 2016 | I T 2017 | II T 2017 | III T 2017 | IV T 2017 |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Traditional basic telephony and VoIP | 19,993 | 20,249 | 19,568 | 20,720 | 23,594 | 23,226 | 22,857 | 22,634 | 22,044 | 21,903 | 20,959 | 21,457 | 22,445 | 22,427 | 21,546 | 21,083 | 20,409 | 20,104 | 19,756 | 19,426 |
| Mobile telephony (voice and instant messaging) | 70,336 | 71,149 | 74,448 | 77,264 | 92,258 | 92,931 | 89,201 | 91,753 | 89,494 | 92,544 | 87,429 | 88,911 | 85,652 | 86,537 | 87,850 | 87,675 | 86,024 | 85,649 | 86,477 | 89,342 |
| Internet access (including mobile Internet) | 34,122 | 38,175 | 44,204 | 45,413 | 52,102 | 55,841 | 54,345 | 57,161 | 64,210 | 67,027 | 69,818 | 70,168 | 71,449 | 74,586 | 78,516 | 80,659 | 80,759 | 84,746 | 84,018 | 85,613 |
| Dedicated lines | 9,404 | 10,439 | 10,581 | 10,677 | 10,835 | 10,612 | 10,211 | 8,930 | 8,890 | 9,351 | 9,174 | 8,787 | 7,611 | 8,384 | 9,306 | 9,132 | 11,360 | 10,595 | 11,028 | 11,992 |
| Total | 133,856 | 140,012 | 148,801 | 154,074 | 178,789 | 182,611 | 176,614 | 180,477 | 184,637 | 190,825 | 187,380 | 189,322 | 187,157 | 191,934 | 197,219 | 198,549 | 198,552 | 201,093 | 201,279 | 206,372 |

Source: SUTEL, General Directorate for Markets.

Table N° 47
Costa Rica. Total income of the telecommunications sector according to service, 2013 - 2017
(Yearly figures in million colones)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|--|----------------|----------------|----------------|----------------|----------------|
| Mobile telephony (voice and instant messaging) | 293,197 | 366,143 | 358,377 | 347,713 | 347,492 |
| Traditional basic telephony and VoIP telephony | 80,531 | 92,311 | 86,363 | 87,501 | 79,695 |
| Internet access (including mobile Internet) | 161,914 | 219,449 | 271,222 | 305,210 | 335,136 |
| Dedicated lines | 41,101 | 40,588 | 36,202 | 34,433 | 44,974 |
| Total | 576,742 | 718,491 | 752,164 | 774,858 | 807,296 |

Source: SUTEL, General Directorate for Markets.



Table N° 48

Costa Rica. Total income of the telecommunications sector according to service, 2013 - 2017
(Annual figures in percentages)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|--------------|--------------|--------------|--------------|--------------|
| Mobile telephony (voice and instant messaging) | 51 % | 51 % | 48 % | 45 % | 43 % |
| Traditional basic telephony and VoIP telephony | 14 % | 13 % | 11 % | 11 % | 10 % |
| Internet access (including mobile Internet) | 28 % | 31 % | 36 % | 39 % | 41 % |
| Dedicated lines | 7 % | 5 % | 5 % | 5 % | 6 % |
| Total | 100 % | 100 % | 100 % | 100 % | 100 % |

Source: SUTEL, General Directorate for Markets.

Table N° 49

Costa Rica. Total income of the telecommunications sector according to service, 2013 - 2017
(Annual figures in million colones)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|----------------|----------------|----------------|----------------|----------------|
| Mobile telephony (voice and instant messaging) | 387,202 | 493,340 | 528,751 | 542,216 | 555,156 |
| Traditional basic telephony and VoIP telephony | 80,531 | 92,311 | 86,363 | 87,501 | 79,695 |
| Fixed Internet access | 67,909 | 92,252 | 100,848 | 110,707 | 127,472 |
| Dedicated lines | 41,101 | 40,588 | 36,202 | 34,433 | 44,974 |
| Total | 576,742 | 718,491 | 752,164 | 774,858 | 807,296 |

Source: SUTEL, General Directorate for Markets.

Table N° 50

Costa Rica. Total income of the telecommunications sector according to service, 2013 - 2017
(Annual figures in percentages)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|--|--------------|--------------|--------------|--------------|--------------|
| Mobile telephony and mobile Internet access (Mobile network) | 67 % | 69 % | 70 % | 70 % | 69 % |
| Traditional basic telephony and VoIP telephony | 14 % | 13 % | 12 % | 11 % | 10 % |
| Fixed Internet access | 12 % | 13 % | 13 % | 14 % | 16 % |
| Dedicated lines | 7 % | 5 % | 5 % | 5 % | 5 % |
| Total | 100 % | 100 % | 100 % | 100 % | 100 % |

Source: SUTEL, General Directorate for Markets.

Table N° 51

Costa Rica. Labor force in the telecommunications sector, 2013-2016
(Bi-annual and annual figures in number of people and percentages)

| Indicator | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | IS | IIS | IS | IIS | IS | IIS | IS | IIS | IS | IIS |
| Persons | 10,347 | 10,442 | 11,006 | 11,017 | 11,497 | 11,426 | 11,751 | 11,870 | 11,681 | 12,186 |
| % variation | 5 % | 1 % | 5 % | 0 % | 4 % | -1 % | 3 % | 1 % | -2 % | 3 % |

Source: SUTEL, General Directorate for Markets.



Table N° 52

Costa Rica. Percentage of labor force in the telecommunications sector with respect to the economically active population, 2013-2017
(Annual figures in number of people and percentages)

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------------------|-----------|-----------|-----------|-----------|-----------|
| Total country | 2,235,770 | 2,284,142 | 2,276,104 | 2,206,179 | 2,274,432 |
| Telecommunications Sector | 10,442 | 11,017 | 11,426 | 11,870 | 12,186 |
| Percentage | 0.47 % | 0.48 % | 0.50 % | 0.54 % | 0.54 % |
| Percentage of variation | 4 % | 8 % | 7 % | 7 % | 0 % |

Source: SUTEL, General Directorate for Markets. e INEC.

Table N° 53

Costa Rica. Percentage of labor force of the telecommunications sector with respect to the total population, 2013-2017
(Annual figures in number of people and percentages)

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Total population | 4,713,168.1 | 4,773,129.9 | 4,832,233.8 | 4,890,379.0 | 4,947,490.0 |
| Telecommunication Sector labor force | 10,442 | 11,017 | 11,426 | 11,870 | 12,186 |
| Percentage | 0.22 % | 0.23 % | 0.24 % | 0.24 % | 0.25 % |

Source: SUTEL, General Directorate for Markets. e INEC.

Table N° 54

Costa Rica. Female labor force in the telecommunications sector, 2013-2017
(Bi-annual figures in number of people and percentages)

| Indicator | 2013 | | 2014 | | 2015 | | 2016 | | 2017 | |
|----------------------------------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|
| | I Sem | II Sem | I Sem | II Sem | I Sem | II Sem | I Sem | II Sem | I Sem | II Sem |
| Persons | 2,792 | 2,873 | 2,811 | 2,914 | 2,963 | 3,010 | 3,057 | 3,061 | 3,178 | 3,344 |
| Percentage of biannual variation | | 3 % | | 4 % | | 2 % | | 0 % | | 5 % |
| Percentage of annual variation | | | | 1 % | | 3 % | | 2 % | | 9 % |

Source: SUTEL, General Directorate for Markets. e INEC.



FIXED TELEPHONY

Table N° 55

Costa Rica. Subscriptions to traditional basic telephony and VoIP telephony, 2013 - 2017
(Figures at the closing of each year)

| Subscriptions | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------------|---------|---------|---------|---------|---------|
| Total | 968,459 | 881,217 | 859,857 | 849,826 | 829,658 |
| Traditional basic telephony | 936,035 | 839,968 | 804,468 | 779,972 | 747,428 |
| VoIP | 32,424 | 41,249 | 55,389 | 69,854 | 82,230 |

Source: SUTEL, General Directorate for Markets.

Table N° 56

Costa Rica. Subscriptions to traditional basic telephony and VoIP telephony, 2016 - 2017
(Figures at the closing of each quarter)

| Subscriptions | 2016 | | | | 2017 | | | |
|-----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | I T | II T | III T | IV T | I T | II T | III T | IV T |
| Total | 859,167 | 856,226 | 853,484 | 849,826 | 846,344 | 843,189 | 838,602 | 829,658 |
| Traditional basic telephony | 799,696 | 794,172 | 787,020 | 779,972 | 771,725 | 767,115 | 759,127 | 747,428 |
| VoIP | 59,471 | 62,054 | 66,464 | 69,854 | 74,619 | 76,074 | 79,475 | 82,230 |

Source: SUTEL, General Directorate for Markets.

Table N° 57

Costa Rica. Distribución Subscriptions de Traditional basic telephony y telefonía VoIP,
2013 - 2017

(Figures at the closing of each year in percentages)

| Subscriptions | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------------|--------|--------|--------|--------|--------|
| Traditional basic telephony | 96.7 % | 95.3 % | 93.6 % | 91.8 % | 90.1 % |
| VoIP | 3.3 % | 4.7 % | 6.4 % | 8.2 % | 9.9 % |

Source: SUTEL, General Directorate for Markets.

Table N° 58

Costa Rica. Percentage distribution of subscriptions of traditional basic telephony and VoIP
telephony, 2016 - 2017

(Figures at the closing of each quarter in percentages)

| Subscriptions | 2016 | | | | 2017 | | | |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | I T | II T | III T | IV T | I T | II T | III T | IV T |
| Traditional basic telephony | 93.1 % | 92.8 % | 92.2 % | 91.8 % | 91.2 % | 91.0 % | 90.5 % | 90.1 % |
| VoIP | 6.9 % | 7.2 % | 7.8 % | 8.2 % | 8.8 % | 9.0 % | 9.5 % | 9.9 % |

Source: SUTEL, General Directorate for Markets.

**Table N° 59**

Costa Rica. Penetration of the traditional basic telephony service with respect to the population, 2013-2017

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------------------|-----------|-----------|-----------|-----------|-----------|
| Fixed connections per capita | 19.9 % | 17.6 % | 16.6 % | 15.9 % | 15.1 % |
| Fixed traditional basic telephony | 936,035 | 839,968 | 804,468 | 779,972 | 747,428 |
| Total population | 4,713,168 | 4,773,130 | 4,832,234 | 4,890,379 | 4,947,481 |

Source: SUTEL, General Directorate for Markets.

Table N° 60

Costa Rica. Penetration of VoIP service with respect to the population, 2013-2017

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|--|-----------|-----------|-----------|-----------|-----------|
| Fixed connections for every 1000 inhabitants | 6.9 | 8.6 | 11.5 | 14.3 | 16.6 |
| VoIP subscribers | 32,424 | 41,249 | 55,389 | 69,854 | 82,230 |
| Total population | 4,713,168 | 4,773,130 | 4,832,234 | 4,890,379 | 4,947,481 |

Source: SUTEL, General Directorate for Markets.

Table N° 61

Costa Rica. Traditional basic telephony: number of public telephones in operation, 2013-2017

(Figures at the closing of each year)

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------------|--------|-------|-------|-------|-------|
| Public telephones | 13,145 | 8,188 | 5,726 | 4,731 | 4,674 |

Source: SUTEL, General Directorate for Markets.

Table N° 62

Costa Rica. TFixed telephony traffic completed on net and outbound, 2013-2017
(Annual figures in millions of minutes and percentages of variation)

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------|------|---------|--------|--------|---------|
| Minutes | 4138 | 3472 | 3210 | 2909 | 2586 |
| % of variation | | -16.1 % | -7.6 % | -9.4 % | -11.1 % |

Source: SUTEL, General Directorate for Markets.

Table N° 63

Costa Rica. VoIP telephony traffic completed on net and outbound, 2013-2017
(Annual figures in millions of minutes and percentages of variation)

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------|--------|---------|---------|---------|---------|
| Minutes | 77,532 | 173,391 | 232,235 | 279,027 | 295,964 |
| % of variation | | 123.6 % | 33.9 % | 20.1 % | 6.1 % |

Source: SUTEL, General Directorate for Markets.

**Table N° 64**

Costa Rica. Fixed telephony traffic completed on net and outbound, 2016-2017
(Quarterly figures in millions of minutes and percentages of variation)

| Indicator | 2016 | | | | 2017 | | | |
|----------------|------|-------|--------|--------|--------|--------|--------|-------|
| | I T | II T | III T | IV T | I T | II T | III T | IV T |
| Minutes | 736 | 746 | 714 | 712 | 671 | 648 | 632 | 636 |
| % of variation | | 1.3 % | -4.4 % | -0.3 % | -5.8 % | -3.5 % | -2.5 % | 0.7 % |

Source: SUTEL, General Directorate for Markets.

Table N° 65

Costa Rica. VoIP telephony traffic completed on net and outbound, 2016 - 2017
(Quarterly figures in millions of minutes and percentages of variation)

| Indicator | 2016 | | | | 2017 | | | |
|----------------|------|--------|--------|-------|--------|--------|--------|--------|
| | I T | II T | III T | IV T | I T | II T | III T | IV T |
| Minutes | 57 | 65 | 77 | 80 | 76 | 70 | 66 | 84 |
| % of variation | | 14.7 % | 18.2 % | 3.1 % | -4.2 % | -7.6 % | -6.8 % | 27.2 % |

Source: SUTEL, General Directorate for Markets.

Table N° 66

Costa Rica. Total income from fixed telephony services, 2013 - 2017
(Annual figures in million colones and percentages of variation)

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------|--------|--------|--------|--------|--------|
| Income | 80,531 | 92,311 | 86,363 | 87,501 | 79,695 |
| % of variation | | 14.6 % | -6.4 % | 1.3 % | -8.9 % |

Source: SUTEL, General Directorate for Markets.

Table N° 67

Costa Rica. Income from VoIP telephony, 2013 - 2017
(Annual figures in million colones and percentages of variation)

| Indicator | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------|-------|--------|--------|-------|-------|
| Income | 2,506 | 4,300 | 4,973 | 5,435 | 5,918 |
| % of variation | --- | 71.6 % | 15.7 % | 9.3 % | 8.9 % |

Source: SUTEL, General Directorate for Markets.

Table N° 68

Costa Rica. Total income from fixed telephony services, 2016 - 2017
(Quarterly figures in million colones and percentages of variation)

| Indicator | 2016 | | | | 2017 | | | |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | I T | II T | III T | IV T | I T | II T | III T | IV T |
| Income | 22,445 | 22,427 | 21,546 | 21,083 | 20,409 | 20,104 | 19,756 | 19,426 |
| % of variation | | -0.1 % | -3.9 % | -2.1 % | -3.2 % | -1.5 % | -1.7 % | -1.7 % |

Source: SUTEL, General Directorate for Markets.



Table N° 69

Costa Rica. Income from VoIP telephony, 2016 - 2017
(Quarterly figures in million colones and percentages of variation)

| Indicator | 2016 | | | | 2017 | | | |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | I T | II T | III T | IV T | I T | II T | III T | IV T |
| Income | 1,324.0 | 1,328.4 | 1,382.6 | 1,400.2 | 1,514.1 | 1,439.8 | 1,464.0 | 1,500.1 |
| % of variation | | 0.3 % | 4.1 % | 1.3 % | 8.1 % | -4.9 % | 1.7 % | 2.5 % |

Source: SUTEL, General Directorate for Markets.

Table N° 70

Costa Rica. Average income per subscriber in traditional basic telephony and VoIP telephony, 2013-2017
(Annual figures in colones and percentages of variation)

| Year | Average income | | | Percentage variation | | |
|------|-------------------|---------|-----------------|----------------------|-------|-----------------|
| | Traditional basic | VOIP | Fixed Telephony | Traditional basic | VOIP | Fixed Telephony |
| 2013 | 83,357 | 77,274 | 83,153 | --- | --- | --- |
| 2014 | 104,772 | 104,368 | 104,753 | 26 % | 35 % | 26 % |
| 2015 | 101,172 | 90,355 | 100,479 | -3 % | -13 % | -4 % |
| 2016 | 105,217 | 77,808 | 102,964 | 4 % | -14 % | 2 % |
| 2017 | 98,708 | 71,969 | 96,058 | -6 % | -8 % | -7 % |

Source: SUTEL, General Directorate for Markets.

Table N° 71

Costa Rica. Average income per minute in traditional basic telephony and VoIP telephony, 2013-2017
(Figures in colones and percentages of variation)

| Year | Average income | | | Percentage variation | | |
|------|-------------------|------|-----------------|----------------------|------|-----------------|
| | Traditional basic | VOIP | Fixed Telephony | Traditional basic | VOIP | Fixed Telephony |
| 2013 | 32 | 19 | 19 | --- | --- | --- |
| 2014 | 25 | 27 | 27 | -23 % | 39 % | 37 % |
| 2015 | 21 | 27 | 27 | -14 % | 2 % | 1 % |
| 2016 | 19 | 31 | 30 | -9 % | 14 % | 12 % |
| 2017 | 20 | 32 | 31 | 3 % | 3 % | 2 % |

Source: SUTEL, General Directorate for Markets.



MOBILE TELEPHONY

Table N° 72

Costa Rica. Total subscriptions to the mobile telephony service by operator, 2013-2017

(Figures at the closing of each quarter in thousands of subscriptions and percentages of variation)

| Total | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | | |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| ICE | 3,977 | 4,075 | 4,278 | 4,337 | 4,177 | 4,251 | 4,297 | 4,348 | 4,253 | 3,925 | 4,048 | 4,339 | 4,302 | 4,314 | 4,391 | 4,440 | 4,592 | 4,521 | 4,596 | 4,576 |
| % of variation | 2 % | 2 % | 5 % | 1 % | -4 % | 2 % | 1 % | 1 % | -2 % | -8 % | 3 % | 7 % | -1 % | 0 % | 2 % | 1 % | 3 % | -2 % | 2 % | 0 % |
| Claro | 899 | 923 | 1,056 | 1,307 | 1,386 | 1,282 | 1,121 | 1,144 | 1,206 | 1,319 | 1,328 | 1,414 | 1,526 | 1,559 | 1,551 | 1,639 | 1,772 | 1,888 | 1,891 | 1,883 |
| % of variation | 12 % | 3 % | 14 % | 24 % | 6 % | -7 % | -13 % | 2 % | 5 % | 9 % | 1 % | 6 % | 8 % | 2 % | -1 % | 6 % | 8 % | 7 % | 0 % | 0 % |
| Movistar | 645 | 814 | 1,063 | 1,272 | 1,369 | 1,326 | 1,361 | 1,431 | 1,515 | 1,493 | 1,637 | 1,677 | 1,790 | 1,905 | 2,087 | 2,144 | 2,181 | 2,223 | 2,237 | 2,324 |
| % of variation | 44 % | 26 % | 31 % | 20 % | 8 % | -3 % | 3 % | 5 % | 6 % | -1 % | 10 % | 2 % | 7 % | 6 % | 10 % | 3 % | 2 % | 2 % | 1 % | 4 % |
| Fullmóvil | 79 | 48 | 44 | 45 | 34 | 24 | 27 | 31 | 33 | 41 | 50 | 59 | 63 | 71 | 92 | 101 | 110 | 106 | 95 | 52 |
| % of variation | -17 % | -39 % | -8 % | 2 % | -24 % | -28 % | 9 % | 15 % | 8 % | 24 % | 22 % | 19 % | 7 % | 12 % | 29 % | 10 % | 9 % | -3 % | -11 % | -45 % |
| Tuyo Móvil | 101 | 93 | 93 | 98 | 83 | 73 | 68 | 67 | 55 | 47 | 48 | 46 | 29 | 11 | 9 | 7 | 7 | 7 | 5 | 4 |
| % of variation | -6 % | -8 % | 1 % | 5 % | -16 % | -12 % | -7 % | -2 % | -18 % | -14 % | 2 % | -5 % | -37 % | -60 % | -26 % | -13 % | -1 % | -1 % | -37 % | -11 % |
| TOTAL | 5,700 | 5,952 | 6,534 | 7,059 | 7,049 | 6,957 | 6,873 | 7,020 | 7,061 | 6,826 | 7,112 | 7,536 | 7,711 | 7,860 | 8,130 | 8,331 | 8,663 | 8,746 | 8,823 | 8,840 |
| % of variation | 7 % | 4 % | 10 % | 8 % | 0 % | -1 % | -1 % | 2 % | 1 % | -3 % | 4 % | 6 % | 2 % | 2 % | 3 % | 2 % | 4 % | 1 % | 1 % | 0 % |

Source: SUTEL, General Directorate for Markets.

Table N° 73

Costa Rica. Total subscriptions of the mobile telephony service per modality of payment, 2013-2017

(Figures at the closing of each quarter in thousands of subscriptions and percentages of variation)

| Total | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | | |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| Pre-paid | 4,544 | 4,808 | 5,367 | 5,832 | 5,723 | 5,590 | 5,491 | 5,599 | 5,602 | 5,344 | 5,579 | 5,951 | 6,100 | 6,189 | 6,379 | 6,469 | 6,721 | 6,743 | 6,841 | 6,796 |
| % of variation | 8 % | 6 % | 12 % | 9 % | -2 % | -2 % | -2 % | 2 % | 0 % | -5 % | 4 % | 7 % | 3 % | 1 % | 3 % | 1 % | 4 % | 0 % | 1 % | -1 % |
| Post-paid | 1,156 | 1,144 | 1,168 | 1,228 | 1,326 | 1,366 | 1,383 | 1,422 | 1,459 | 1,481 | 1,532 | 1,584 | 1,611 | 1,672 | 1,751 | 1,862 | 1,942 | 2,002 | 1,983 | 2,045 |
| % of variation | 2 % | -1 % | 2 % | 5 % | 8 % | 3 % | 1 % | 3 % | 3 % | 2 % | 3 % | 3 % | 2 % | 4 % | 5 % | 6 % | 4 % | 3 % | -1 % | 3 % |
| Total | 5,700 | 5,952 | 6,534 | 7,059 | 7,049 | 6,957 | 6,873 | 7,020 | 7,061 | 6,826 | 7,112 | 7,536 | 7,711 | 7,860 | 8,130 | 8,331 | 8,663 | 8,746 | 8,823 | 8,840 |
| % of variation | 7 % | 4 % | 10 % | 8 % | 0 % | -1 % | -1 % | 2 % | 1 % | -3 % | 4 % | 6 % | 2 % | 2 % | 3 % | 2 % | 4 % | 1 % | 1 % | 0 % |

Source: SUTEL, General Directorate for Markets.

Table N° 74

Costa Rica. Penetration of the mobile telephony service for every 100 inhabitants, 2013-2017

(Annual figures in percentages)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------------------|-------|-------|-------|-------|-------|
| Mobile penetration | 150 % | 147 % | 156 % | 170 % | 179 % |

Source: SUTEL, General Directorate for Markets.



Table N° 75

Costa Rica. Participation of mobile telephony subscriptions by operator per payment modality, 2013-2017
(Annual figures in percentages)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|------------------|-------|-------|-------|-------|-------|
| Pre-paid | | | | | |
| ICE | 57 % | 58 % | 54 % | 49 % | 48 % |
| Claro | 20 % | 17 % | 19 % | 19 % | 22 % |
| Movistar | 20 % | 23 % | 26 % | 30 % | 30 % |
| Fullmóvil | 0.8 % | 0.5 % | 1.0 % | 1.6 % | 0.8 % |
| Tuyo Móvil | 1.7 % | 1.2 % | 0.8 % | 0.1 % | 0.1 % |
| Post-paid | | | | | |
| ICE | 80 % | 76 % | 71 % | 68 % | 64 % |
| Claro | 12 % | 15 % | 19 % | 21 % | 20 % |
| Movistar | 8 % | 9 % | 10 % | 11 % | 15 % |

Source: SUTEL, General Directorate for Markets.

Table N° 76

Costa Rica. Total income associated to the telephony and mobile network (including Internet) service per component¹, 2013-2017
(Annual figures in million colones)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------------------|----------------|----------------|----------------|----------------|----------------|
| Mobile network | 386,819 | 493,217 | 528,743 | 542,202 | 555,156 |
| Mobile telephony | 293,197 | 366,143 | 358,377 | 347,713 | 347,492 |
| Voice | 254,527 | 342,580 | 344,057 | 337,130 | 336,542 |
| SMS/MMS | 38,670 | 23,562 | 14,320 | 10,583 | 10,950 |
| Mobile data | 93,622 | 127,074 | 170,366 | 194,489 | 207,664 |

¹It does not include roaming income..

Source: SUTEL, General Directorate for Markets.

Table N° 77

Costa Rica. Total income associated to the mobile network according to payment modality¹, 2013-2017
(Annual figures in million colones)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------------|----------------|----------------|----------------|----------------|----------------|
| TOTAL | 386,819 | 493,217 | 528,743 | 542,202 | 555,156 |
| Pre-paid | 207,126 | 278,726 | 252,553 | 244,181 | 216,369 |
| Post-paid | 179,693 | 214,490 | 276,190 | 298,021 | 338,787 |

¹It does not include roaming income.

Source: SUTEL, General Directorate for Markets.



Table N° 78
Costa Rica. Average income per minute in mobile telephony (ARPM)¹, 2013-2017
 (Annual figures in colones and minutes)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Income from voice | 254,526,761,626 | 342,580,304,459 | 344,057,278,461 | 337,130,465,127 | 336,541,928,366 |
| Total traffic | 8,798,921,561 | 9,037,291,821 | 8,252,296,345 | 7,631,673,792 | 6,827,569,387 |
| ARPM | 29 | 38 | 42 | 44 | 49 |

¹It only includes traffic and income from voice.

Source: SUTEL, General Directorate for Markets.

Table N° 79
Costa Rica. Total traffic and participation according to payment modality per year, 2013-2017
 (Figures in millions of minutes and percentages)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------------|--------------|--------------|--------------|--------------|--------------|
| Total traffic | 8,799 | 9,037 | 8,252 | 7,632 | 6,828 |
| Pre-paid | 5,967 | 5,799 | 4,868 | 4,210 | 3,328 |
| Post-paid | 2,832 | 3,238 | 3,384 | 3,422 | 3,499 |
| Pre-paid | 68 % | 64 % | 59 % | 55 % | 49 % |
| Post-paid | 32 % | 36 % | 41 % | 45 % | 51 % |

Source: SUTEL, General Directorate for Markets.

Table N° 80
Costa Rica. Distribution in relation to traffic of mobile telephone service according to origin and destination with respect to total traffic, 2013-2017
 (Annual figures in millions of minutes and percentages)

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------------------|--------------|--------------|--------------|--------------|--------------|
| Total traffic | 8,799 | 9,037 | 8,252 | 7,632 | 6,828 |
| Mobile-mobile (on net) | 60 % | 58 % | 55 % | 53 % | 51 % |
| Mobile-mobile (off net) | 15 % | 20 % | 23 % | 25 % | 27 % |
| Mobile-fixed | 22 % | 19 % | 18 % | 18 % | 18 % |
| Mobile-international | 3 % | 3 % | 3 % | 4 % | 4 % |

Source: SUTEL, General Directorate for Markets.



DATA TRANSFER

Table N° 81

Costa Rica. Subscriptions, income and total traffic of fixed Internet access service, 2014-2017
(Quarterly figures)

| | 2014 | | | | 2015 | | | |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| Subscriptions | 497,092 | 502,655 | 504,105 | 516,337 | 527,664 | 537,483 | 547,558 | 558,656 |
| % of variation | | 1.1 % | 0.3 % | 2.4 % | 2.2 % | 1.9 % | 1.9 % | 2.0 % |
| Income (billion colones) | 23,052 | 24,351 | 22,631 | 22,217 | 23,556 | 24,096 | 24,314 | 25,004 |
| % of variation | | 5.6 % | -7.1 % | -1.8 % | 6.0 % | 2.3 % | 0.9 % | 2.8 % |
| Traffic (TB) | 25,012 | 31,850 | 38,282 | 43,401 | 55,998 | 60,689 | 72,942 | 76,727 |
| % of variation | | 27.3 % | 20.2 % | 13.4 % | 29.0 % | 8.4 % | 20.2 % | 5.2 % |

| | 2016 | | | | 2017 | | | |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| Subscriptions | 570,826 | 597,025 | 614,039 | 636,087 | 657,407 | 694,267 | 718,985 | 744,041 |
| % of variation | 2.2 % | 4.6 % | 2.8 % | 3.6 % | 3.4 % | 5.6 % | 3.6 % | 3.5 % |
| Income (billion colones) | 25,471 | 26,892 | 28,531 | 29,813 | 29,206 | 31,967 | 32,265 | 34,034 |
| % of variation | 1.9 % | 5.6 % | 6.1 % | 4.5 % | -2.0 % | 9.5 % | 0.9 % | 5.5 % |
| Traffic (TB) | 84,792 | 85,233 | 98,933 | 118,561 | 141,718 | 147,699 | 154,217 | 176,447 |
| % of variation | 10.5 % | 0.5 % | 16.1 % | 19.8 % | 19.5 % | 4.2 % | 4.4 % | 14.4 % |

Source: SUTEL, General Directorate for Markets.

Table N° 82

Costa Rica. Subscriptions, income and total traffic of mobile Internet access service, 2014-2017
(Quarterly figures)

| | 2014 | | | | 2015 | | | |
|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| Subscriptions | 3,465,856 | 3,536,075 | 3,551,430 | 3,796,619 | 3,832,819 | 3,829,223 | 3,981,967 | 4,154,419 |
| % of variation | | 2.0 % | 0.4 % | 6.9 % | 1.0 % | -0.1 % | 4.0 % | 4.3 % |
| Income (billion colones) | 29,050.2 | 31,489.7 | 31,713.5 | 34,944.2 | 39,569.2 | 42,080.1 | 44,499.3 | 44,273.0 |
| % of variation | | 8.4 % | 0.7 % | 10.2 % | 13.2 % | 6.3 % | 5.7 % | -0.5 % |
| Traffic (TB) | 8,268.6 | 8,426.2 | 9,956.3 | 11,316.8 | 14,663.1 | 16,821.4 | 19,945.1 | 23,503.6 |
| % of variation | | 1.9 % | 18.2 % | 13.7 % | 29.6 % | 14.7 % | 18.6 % | 17.8 % |

| | 2016 | | | | 2017 | | | |
|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| % of variation | 4,180,219 | 4,172,235 | 4,178,455 | 4,336,084 | 4,636,451 | 4,644,695 | 4,637,919 | 4,788,964 |
| Income (billion colones) | 0.6 % | -0.2 % | 0.1 % | 3.8 % | 6.9 % | 0.2 % | -0.1 % | 3.3 % |
| % of variation | 45,977.6 | 47,693.7 | 49,985.3 | 50,846.4 | 51,553.1 | 52,779.2 | 51,752.9 | 51,578.8 |
| Traffic (TB) | 3.9 % | 3.7 % | 4.8 % | 1.7 % | 1.4 % | 2.4 % | -1.9 % | -0.3 % |
| % of variation | 24,737.1 | 28,953.1 | 31,875.2 | 36,623.5 | 37,588.7 | 33,458.5 | 31,940.4 | 32,015.2 |
| | 5.2 % | 17.0 % | 10.1 % | 14.9 % | 2.6 % | -11.0 % | -4.5 % | 0.2 % |

Source: SUTEL, General Directorate for Markets.



SUBSCRIPTION TELEVISION SERVICE

Table N° 83

Costa Rica. Number of subscriptions to the paid television service according to access technology, 2013-2017

| Technology | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | | |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| Cable television | 467,125 | 469,332 | 474,119 | 489,848 | 500,016 | 505,883 | 508,268 | 510,390 | 510,578 | 512,062 | 526,777 | 531,807 | 536,335 | 530,604 | 535,920 | 548,113 | 552,115 | 556,100 | 559,012 | 563,607 |
| Satellite television | 99,610 | 116,371 | 130,495 | 146,936 | 162,355 | 171,641 | 186,591 | 217,140 | 226,473 | 241,269 | 253,271 | 257,986 | 252,604 | 261,102 | 258,505 | 257,486 | 255,434 | 252,209 | 247,199 | 244,881 |
| Television over IP | 886 | 1,294 | 2,168 | 3,071 | 3,483 | 3,674 | 3,804 | 4,191 | 4,534 | 5,111 | 5,889 | 6,434 | 7,910 | 10,582 | 12,956 | 14,702 | 16,635 | 18,302 | 20,260 | 22,054 |
| Ground television through multi-point distribution | 1,136 | 1,097 | 922 | 1,187 | 1,091 | 1,093 | 876 | 825 | 631 | 657 | 605 | 1003 | 892 | 903 | 942 | 1274 | 1306 | 1193 | 1257 | 1365 |
| Total | 568,757 | 588,094 | 607,704 | 641,042 | 666,945 | 682,291 | 699,539 | 732,546 | 742,216 | 759,099 | 786,542 | 797,230 | 797,741 | 803,191 | 808,323 | 821,575 | 825,490 | 827,804 | 827,728 | 831,907 |

Source: SUTEL, General Directorate for Markets.

Table N° 84

Costa Rica. Total income from the paid television service according to access technology, 2013-2017
(Quarterly figures in million colones)

| Technology | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT | IT | IIT | IIIT | IVT |
| Cable television | 20,061 | 19,973 | 19,907 | 20,870 | 22,374 | 22,642 | 23,690 | 23,288 | 24,344 | 24,749 | 24,631 | 25,134 | 26,252 | 25,751 | 25,823 | 26,101 | 25,784 | 25,831 | 25,524 | 26,604 |
| Satellite television | 4,510 | 5,388 | 6,038 | 6,548 | 7,207 | 7,774 | 7,590 | 8,150 | 8,275 | 8,583 | 9,303 | 8,409 | 7,377 | 9,034 | 9,117 | 8,691 | 10,003 | 10,149 | 10,521 | 10,123 |
| Television over IP | 48 | 72 | 123 | 204 | 426 | 463 | 402 | 328 | 287 | 315 | 371 | 398 | 439 | 522 | 653 | 721 | 866 | 996 | 1,084 | 1,171 |
| Ground television through multi-point distribution | 17 | 15 | 14 | 15 | 14 | 15 | 14 | 14 | 12 | 12 | 12 | 12 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 13 |
| Total | 24,635 | 25,449 | 26,082 | 27,636 | 30,078 | 30,893 | 31,695 | 31,779 | 32,919 | 33,659 | 34,318 | 33,954 | 34,081 | 35,319 | 35,605 | 35,525 | 36,665 | 36,988 | 37,142 | 37,911 |

Source: SUTEL, General Directorate for Markets.



COMMERCIAL OFFERS AND PRICES

Table N° 85
Costa Rica. Mobile telephone offers presented in december 2016

| Date of admission | Operator | Plan or package name | Mode of payment | Services included | Duration or validity of the plan | | Registration Fee and / or Deposit | Monthly Price of the Plan or package (tax included) |
|-------------------|----------|--------------------------------------|-----------------|---|----------------------------------|--------|-----------------------------------|---|
| 01/12/2016 | Kolbi | Plan Internet Móvil En Todas 1 | Pre-paid | Internet | 1 | days | ¢200 | - |
| 01/12/2016 | Kolbi | Plan Internet Móvil En Todas 3 | Pre-paid | Internet | 3 | days | ¢600 | - |
| 01/12/2016 | Kolbi | Plan Internet Móvil En Todas Plus 5 | Pre-paid | Internet | 5 | days | ¢1,300 | - |
| 01/12/2016 | Kolbi | Plan Internet Móvil En Todas Plus 10 | Pre-paid | Internet | 10 | days | ¢2,500 | - |
| 01/12/2016 | Kolbi | Plan Internet Móvil En Todas y más | Pre-paid | Internet | 30 | days | ¢9,000 | - |
| 01/12/2016 | Kolbi | Internet Conecta 512 kbps (VA) | Post-paid | Internet | 30 | days | - | ¢2,000 |
| 01/12/2016 | Kolbi | Internet Conecta 1 Mbps (VA) | Post-paid | Internet | 30 | days | - | ¢4,000 |
| 01/12/2016 | Kolbi | Internet Navega 1.5 Mbps (VA) | Post-paid | Internet | 30 | days | - | ¢7,000 |
| 01/12/2016 | Kolbi | Internet Descarga 2 Mbps (VA) | Post-paid | Internet | 30 | days | - | ¢12,000 |
| 01/12/2016 | Kolbi | Internet Descarga 3 Mbps (VA) | Post-paid | Internet | 30 | days | - | ¢16,000 |
| 01/12/2016 | Kolbi | Internet Descarga 4 Mbps (VA) | Post-paid | Internet | 30 | days | - | ¢20,000 |
| 01/12/2016 | Kolbi | Internet Descarga 5 Mbps (VA) | Post-paid | Internet | 30 | days | - | ¢24,000 |
| 01/12/2016 | Kolbi | Plan kolbi Datos Conecta | Post-paid | Internet | 30 | days | - | ¢6,900 |
| 01/12/2016 | Kolbi | Plan kolbi Datos Conecta 4GLTE | Post-paid | Internet | 30 | days | - | ¢9,900 |
| 01/12/2016 | Kolbi | Plan kolbi Datos Navega 4GLTE | Post-paid | Internet | 30 | days | - | ¢12,900 |
| 01/12/2016 | Kolbi | Plan kolbi Datos Descarga 4GLTE | Post-paid | Internet | 30 | days | - | ¢15,900 |
| 01/12/2016 | Kolbi | De todo | Pre-paid | Minutos, SMS, Internet | 7 | days | ¢0 | ¢2,500 |
| 01/12/2016 | Kolbi | Seguí hablando | Pre-paid | Minutos, SMS, Internet | 7 | days | ¢0 | ¢2,500 |
| 01/12/2016 | Kolbi | Descarga total | Pre-paid | Minutos, SMS, Internet | 7 | days | ¢0 | ¢2,500 |
| 01/12/2016 | Kolbi | De todo extra | Pre-paid | Minutos, SMS, Internet | 15 | days | ¢0 | ¢3,500 |
| 01/12/2016 | Kolbi | Hablá extra | Pre-paid | Minutos, SMS, Internet | 15 | days | ¢0 | ¢3,500 |
| 01/12/2016 | Kolbi | Descarga extra | Pre-paid | Minutos, SMS, Internet | 15 | days | ¢0 | ¢3,500 |
| 01/12/2016 | Claro | POSTPAGO MASIVO PLAN ILIMITADO 1 | Post-paid | Minutes, SMS, Internet, LDI and Roaming | 24 y 12 | months | It depends on the terminal | ¢44,000 |
| 01/12/2016 | Claro | POSTPAGO MASIVO PLAN ILIMITADO 2 | Post-paid | Minutes, SMS, Internet, LDI and Roaming | 24 y 12 | months | It depends on the terminal | ¢55,000 |

Source: SUTEL, General Directorate for Markets.



Table N° 86
Costa Rica. Current mobile telephony offers by the end of 2017

| Date of admission | Operator | Plan or package name | Mode of payment | Services included | Duration or validity of the plan | | Registration Fee and / or Deposit | Monthly Price of the Plan or package (tax included) |
|-------------------|----------|--------------------------------------|-----------------|---------------------------------------|----------------------------------|--------|-----------------------------------|---|
| 01/12/2017 | Kolbi | Plan Internet Móvil En Todas 1 | Pre-paid | Internet | 1 | days | | ¢200 |
| 01/12/2017 | Kolbi | Plan Internet Móvil En Todas 3 | Pre-paid | Internet | 3 | days | | ¢600 |
| 01/12/2017 | Kolbi | Plan Internet Móvil En Todas Plus 5 | Pre-paid | Internet | 5 | days | | ¢1,300 |
| 01/12/2017 | Kolbi | Plan Internet Móvil En Todas Plus 10 | Pre-paid | Internet | 10 | days | | ¢2,500 |
| 01/12/2017 | Kolbi | Plan Internet Móvil En Todas y más | Pre-paid | Internet | 30 | days | | ¢9,000 |
| 01/12/2017 | Kolbi | Internet móvil 512 kbps | Post-paid | Internet | 30 | days | ¢2,000 | ¢2,000 |
| 01/12/2017 | Kolbi | Internet móvil 1 Mbps | Post-paid | Internet | 30 | days | ¢4,000 | ¢4,000 |
| 01/12/2017 | Kolbi | Internet móvil 1.5 Mbps | Post-paid | Internet | 30 | days | ¢7,000 | ¢7,000 |
| 01/12/2017 | Kolbi | Internet móvil 2 Mbps | Post-paid | Internet | 30 | days | ¢12,000 | ¢12,000 |
| 01/12/2017 | Kolbi | Internet móvil 3 Mbps | Post-paid | Internet | 30 | days | ¢16,000 | ¢16,000 |
| 01/12/2017 | Kolbi | Internet móvil 4 Mbps | Post-paid | Internet | 30 | days | ¢20,000 | ¢20,000 |
| 01/12/2017 | Kolbi | Internet móvil 5 Mbps | Post-paid | Internet | 30 | days | ¢24,000 | ¢24,000 |
| 01/12/2017 | Kolbi | Plan kolbi Datos Conecta | Post-paid | Internet | 30 | days | ¢6,900 | ¢6,900 |
| 01/12/2017 | Kolbi | Plan kolbi Datos Conecta 4GLTE | Post-paid | Internet | 30 | days | ¢9,900 | ¢9,900 |
| 01/12/2017 | Kolbi | Plan kolbi Datos Navega 4GLTE | Post-paid | Internet | 30 | days | ¢12,900 | ¢12,900 |
| 01/12/2017 | Kolbi | Plan kolbi Datos Descarga 4GLTE | Post-paid | Internet | 30 | days | ¢15,900 | ¢15,900 |
| 01/12/2017 | Kolbi | De todo | Pre-paid | Minutes, SMS, Internet | 7 | days | | ¢2,500 |
| 01/12/2017 | Kolbi | Seguí hablando | Pre-paid | Minutes, SMS, Internet | 7 | days | | ¢2,500 |
| 01/12/2017 | Kolbi | Descarga total | Pre-paid | Minutes, SMS, Internet | 7 | days | | ¢2,500 |
| 01/12/2017 | Kolbi | De todo extra | Pre-paid | Minutes, SMS, Internet | 15 | days | | ¢3,500 |
| 01/12/2017 | Kolbi | Hablá extra | Pre-paid | Minutes, SMS, Internet | 15 | days | | ¢3,500 |
| 01/12/2017 | Kolbi | Descarga extra | Pre-paid | Minutes, SMS, Internet | 15 | days | | ¢3,500 |
| 01/11/2017 | Claro | ILIMITADO 1 (ILIMITADO 1) | Post-paid | Minutes, SMS, Internet, LDI & Roaming | 12 , 24 | months | NO | ¢44,000 |
| 01/11/2017 | Claro | ILIMITADO 2 (ILIMITADO 2) | Post-paid | Minutes, SMS, Internet, LDI & Roaming | 12 , 24 | months | NO | ¢55,000 |

Source: SUTEL, General Directorate for Markets.



Table N° 87

Costa Rica. Mobile phone offers associated with user - Quartile 3

| Date of admission | Operator | Plan or package name | Mode of payment | Services included | Duration or validity of the plan | | Registration Fee and / or Deposit | Monthly Price of the Plan or package (tax included) | Amount of minutes to all nets | Number of minutes same mobile operator | Number of minutes out of network | Quantity of SMS to all networks | Quantity of SMS same operator | Amount of SMS other operator | 3G data download speed | | 4G data download speed | | Amount of data download included 3G | |
|-------------------|----------|-------------------------------------|-----------------|---------------------------------------|----------------------------------|--------|-----------------------------------|---|-------------------------------|--|----------------------------------|--|-------------------------------|------------------------------|------------------------|------|------------------------|------|-------------------------------------|----|
| 01/06/2017 | Movistar | Plan 4G@3 con terminal | Post-paid | Minutes, SMS, Internet | 0,12,18,24 | months | - | €24,000 | - | unlimited | 250 | - | unlimited | 250 | 4 | Mb | | | 4 | Mb |
| 01/07/2017 | Movistar | Plan 4G@3 con terminal | Post-paid | Minutes, SMS, Internet | 0,12,18,24 | months | | €24,000 | - | unlimited | 250 | - | unlimited | 250 | 4 | Mb | | | 4 | Mb |
| 01/08/2017 | Claro | POSTPAGO MASIVO SIN LIMITE 3 (PURO) | Postpago | Minutes, SMS, Internet, LDI & Roaming | 24 y 12 | months | NO | €18,500 | 300 | unlimited | 300 | Unlimited to Claro and 300 to other networks | unlimited | 300 | 4 | Mbps | Up to 40 | Mbps | 4 | GB |
| 01/08/2017 | Movistar | Plan 4G@3 con terminal | Post-paid | Minutes, SMS, Internet | 0,12,18,24 | months | €0 | €24,000 | - | unlimited | 250 | - | unlimited | 250 | 4 | Mb | | | 8 | Gb |
| 01/08/2017 | Movistar | Plan 4G@3 sin terminal | Post-paid | Minutes, SMS, Internet | 0,12,18,24 | months | €0 | €20,900 | - | unlimited | 250 | - | unlimited | 250 | 4 | Mb | | | 5 | Gb |
| 01/09/2017 | Claro | SIN LIMITE 3 (PURO) | Post-paid | Minutes, SMS, Internet, LDI & Roaming | 24 y 12 | months | NO | €18,500 | 300 | unlimited | 300 | Unlimited to Claro and 300 to other networks | unlimited | 300 | 4 | Mbps | Up to 40 | Mbps | 4 | GB |
| 01/10/2017 | Claro | SIN LIMITE 3 (PURO) | Post-paid | Minutes, SMS, Internet, LDI & Roaming | 24 y 12 | months | NO | €18,500 | 300 | unlimited | 300 | Unlimited to Claro and 300 to other networks | unlimited | 300 | 4 | Mbps | Up to 40 | Mbps | 4 | GB |
| 01/11/2017 | Claro | SIN LIMITE 3 (PURO) | Post-paid | Minutes, SMS, Internet, LDI & Roaming | 12 , 24 | months | NO | €18,500 | 300 | unlimited | 300 | Unlimited to Claro and 300 to other networks | unlimited | 300 | 4 | Mbps | Up to 40 | Mbps | 4 | GB |
| 01/10/2017 | Kolbi | Plan 4G k3 | Post-paid | Minutes, SMS, Internet | 12 o 24 | months | €12,500 | €18,000 | 300 | - | - | 300 | unlimited | | 8 | Mbps | | | 5 | GB |
| 01/12/2017 | Kolbi | Plan 4G k3 | Post-paid | Minutes, SMS, Internet | 12 o 24 | months | €12,500 | €18,000 | 300 | - | - | 300 | unlimited | | 8 | Mbps | | | 5 | GB |
| 01/12/2017 | Movistar | Plan 4G@3 sin terminal | Post-paid | Minutes, SMS, Internet | 0,12,18,24 | months | €0 | €20,900 | - | unlimited | 250 | - | unlimited | 250 | 4 | Mb | | | 5 | Gb |
| 01/11/2017 | Movistar | Plan 4G@3 con terminal | Post-paid | Minutes, SMS, Internet | 0,12,18,24 | months | €0 | €24,000 | - | unlimited | 250 | - | unlimited | 250 | 4 | Mb | | | 8 | Gb |
| 01/12/2017 | Movistar | Plan 4G@3 con terminal | Post-paid | Minutes, SMS, Internet | 0,12,18,24 | months | €0 | €24,000 | - | unlimited | 250 | - | unlimited | 250 | 4 | Mb | | | 8 | Gb |

Source: SUTEL, General Directorate for Markets.

Table N° 88

Costa Rica. Mobile phone offers associated with a user - Quartile 4

| Date of admission | Operator | Plan or package name | Mode of payment | Services included | Duration or validity of the plan | | Registration Fee and / or Deposit | Monthly Price of the Plan or package (tax included) | Amount of minutes to all nets | Number of minutes same mobile operator | Number of minutes out of network | Quantity of SMS to all networks | Quantity of SMS same operator | Amount of SMS other operator | 3G data download speed | 4G data download speed | Amount of data download included 3G | |
|-------------------|----------|-------------------------------------|-----------------|---|----------------------------------|--------|-----------------------------------|---|-------------------------------|--|----------------------------------|--|-------------------------------|------------------------------|------------------------|------------------------|-------------------------------------|----|
| 01/06/2017 | Claro | POSTPAGO MASIVO SIN LIMITE 4 (PURO) | Post-paid | | | | | €34,900 | 600 | ilimitados | 600 | unlimited to Claro y 600 to other nets | Unlimited | 600 | 8 Mbps | Up to 40 Mbps | 8 GB | GB |
| 01/07/2017 | Claro | Postpago masivo sin limite 4 | Post-paid | Minutes, SMS | 12, 24 | months | NO | €34,900 | 600 | ilimitados | 600 | | Unlimited | 600 | 8 Mbps | Up to 40 Mbps | 8 GB | GB |
| 01/08/2017 | Claro | POSTPAGO MASIVO SIN LIMITE 4 (PURO) | Post-paid | Minutes, SMS, Internet, LDI and Roaming | | | | €34,900 | 600 | | 600 | | Unlimited | 600 | 8 Mbps | Up to 40 Mbps | 8 GB | GB |
| 01/09/2017 | Claro | SIN LIMITE 4 (PURO) | Post-paid | Minutes, SMS | 24 y 12 | months | NO | €34,900 | 600 | ilimitados | 600 | unlimited to Claro y 600 to other nets | | 600 | 8 Mbps | Up to 40 Mbps | 8 GB | GB |
| 01/10/2017 | Claro | SIN LIMITE 3 (PURO) | Post-paid | Minutes, SMS | 24 y 12 | months | NO | €24,500 | 300 | ilimitados | 300 | unlimited to Claro y 600 to other nets | | 300 | 8 Mbps | Up to 40 Mbps | 8 GB | GB |
| 01/10/2017 | Claro | SIN LIMITE 4 (PURO) | Post-paid | Minutes, SMS | 24 y 12 | months | NO | €34,900 | 600 | ilimitados | 600 | unlimited to Claro y 600 to other nets | | 600 | 8 Mbps | Up to 40 Mbps | 8 GB | GB |
| 01/11/2017 | Claro | SIN LIMITE 4 (PURO) | Post-paid | Minutes, SMS, Internet, LDI and Roaming | 12, 24 | months | NO | €34,900 | 600 | | 600 | unlimited to Claro y 600 to other nets | Unlimited | 600 | 8 Mbps | Up to 40 Mbps | 8 GB | GB |
| 01/12/2017 | Kolbi | Plan 4G k4 | Post-paid | Minutes, SMS | 12 o 24 | months | €12,500 | €26,000 | 800 | - | - | 600 | | | 8 Mbps | | 7 GB | GB |

Source: SUTEL, General Directorate for Markets.

Table N° 89

Costa Rica. Basic subscription television package service prices, 2014-2017
(Data in colones)

| Price | 2014 | 2015 | 2016 | 2017 | Variation 2014-2015 | Variation 2015-2016 | Variation 2016-2017 |
|---------|--------|--------|--------|--------|---------------------|---------------------|---------------------|
| Maximum | 21,900 | 22,500 | 21,944 | 19,500 | 2.7 % | -2.5 % | -11.1 % |
| Minimum | 7,300 | 3,738 | 3,867 | 5,384 | -48.8 % | 3.4 % | 39.2 % |
| Average | 12,803 | 12,290 | 13,683 | 12,657 | -4.0 % | 11.3 % | -7.5 % |

Source: SUTEL, General Directorate for Markets.



FONATEL

Table N° 90
Costa Rica. Total of projects in development FONATEL 2012-2017

| Fase | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------------------|------|------|------|------|------|------|
| Formulation / adjudication | 1 | 5 | 4 | 10 | 2 | 6 |
| Implementation | 0 | 2 | 7 | 7 | 19 | 19 |
| Production | 0 | 0 | 2 | 4 | 8 | 11 |
| Development | 1 | 7 | 13 | 21 | 27 | 36 |

Note: Corresponds to the total of projects in different phases of development: formulation, adjudication, execution and production.
Source: SUTEL, General Directorate for FONATEL.

Table N° 91
Costa Rica. Total number of households and people covered by the projects in the production phase of FONATEL, 2012-2017

| Item | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------------|------|------|-------|--------|---------|---------|
| Households | 0 | 0 | 1,537 | 25,664 | 76,710 | 97,053 |
| Persons | 0 | 0 | 5,071 | 89,763 | 250,073 | 315,783 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 92
Costa Rica. Investment amount of FONATEL executed through the programs and projects, 2012-2017
(Features in millions of colones)

| Programa | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------------------------------|------|-----------|--------------|--------------|--------------|---------------|
| "Comunidades Conectadas" Program | - | 49 | 3,077 | 2,878 | 932 | 1,971 |
| "Hogares Conectados" Program | - | - | - | - | 734 | 6,060 |
| "Centros Públicos Conectados" Program | - | - | - | - | - | 4,752 |
| Total | - | 49 | 3,077 | 2,878 | 1,666 | 12,782 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 93
Costa Rica. Total amount of projects executed through the "Comunidades Conectadas" Program in development, 2012-2017

| Fase | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-------------|------|------|------|------|------|------|
| Development | 1 | 7 | 13 | 19 | 26 | 32 |
| Execution | 0 | 2 | 7 | 7 | 19 | 19 |
| Production | 0 | 0 | 2 | 4 | 7 | 13 |

Note: It corresponds to the total of projects in different phases of development: formulation, adjudication, execution and production.

Source: SUTEL, General Directorate for FONATEL.



Table N° 94

Costa Rica. Total number of households and people covered by projects in the production phase "Comunidades Conectadas" Program of FONATEL, 2012-2017

| Item | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------------|------|------|-------|--------|---------|---------|
| Homes | 0 | 0 | 1,537 | 25,664 | 66,621 | 66,621 |
| Population | 0 | 0 | 5,071 | 89,763 | 217,183 | 217,183 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 95

Costa Rica. CPSP amount covered through FONATEL's "Comunidades Conectadas" Program, 2012-2017

| Project | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------|----------|----------|-----------|-----------|------------|------------|
| Roxana | 0 | 0 | 4 | 4 | 4 | 4 |
| Siquirres | 0 | 0 | 11 | 11 | 11 | 11 |
| Guatuso | 0 | 0 | 0 | 0 | 48 | 47 |
| Los Chiles | 0 | 0 | 0 | 0 | 76 | 75 |
| San Carlos | 0 | 0 | 0 | 0 | 78 | 68 |
| Sarapiquí | 0 | 0 | 0 | 0 | 97 | 57 |
| Upala | 0 | 0 | 0 | 0 | 116 | 68 |
| Pérez Zeledón | 0 | 0 | 0 | 0 | 0 | 125 |
| Total | 0 | 0 | 15 | 15 | 430 | 455 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 96

Costa Rica. Total amount of subscriptions for FONATEL's "Comunidades Conectadas" Program, by telecommunication service 2012-2017

| Service | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------|----------|----------|-----------|------------|---------------|---------------|
| Fixed telephony | 0 | 0 | 13 | 10 | 116 | 372 |
| Fixed Internet | 0 | 0 | 18 | 19 | 441 | 1,090 |
| Mobile phone | 0 | 0 | 60 | 812 | 42,586 | 36,732 |
| Total | 0 | 0 | 91 | 841 | 43,143 | 38,194 |

Source: SUTEL, General Directorate for FONATEL.



Table N° 97

Costa Rica. Subscriptions to fixed telephony services provided by FONATEL's "Comunicades Conectadas" Program, by Project 2012-2017

| Project | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------|----------|----------|-----------|-----------|------------|------------|
| Roxana | 0 | 0 | 13 | 9 | 9 | 1 |
| Siquirres | 0 | 0 | 0 | 1 | 1 | 1 |
| Guatuso | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Chiles | 0 | 0 | 0 | 0 | 0 | 0 |
| San Carlos | 0 | 0 | 0 | 0 | 49 | 135 |
| Sarapiquí | 0 | 0 | 0 | 0 | 36 | 30 |
| Upala | 0 | 0 | 0 | 0 | 21 | 103 |
| Pérez Zeledón | 0 | 0 | 0 | 0 | 0 | 102 |
| Total | 0 | 0 | 13 | 10 | 116 | 372 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 98

Costa Rica. Subscriptions to fixed internet services provided by FONATEL's Comunidades Conectadas Program by Project, 2012-2017

| Project | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------|----------|----------|-----------|-----------|------------|--------------|
| Roxana | 0 | 0 | 18 | 18 | 18 | 12 |
| Siquirres | 0 | 0 | 0 | 1 | 1 | 1 |
| Guatuso | 0 | 0 | 0 | 0 | 0 | 0 |
| Los Chiles | 0 | 0 | 0 | 0 | 0 | 0 |
| San Carlos | 0 | 0 | 0 | 0 | 222 | 526 |
| Sarapiquí | 0 | 0 | 0 | 0 | 130 | 109 |
| Upala | 0 | 0 | 0 | 0 | 70 | 240 |
| Pérez Zeledón | 0 | 0 | 0 | 0 | 0 | 202 |
| Total | 0 | 0 | 18 | 19 | 441 | 1,090 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 99

Costa Rica. Subscriptions to fixed mobile telephony service provided by FONATEL's "Comunidades Conectadas" Project by Project, 2012-2017

| Project | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------|----------|----------|-----------|------------|---------------|---------------|
| Roxana | 0 | 0 | 0 | 0 | 0 | 0 |
| Siquirres | 0 | 0 | 60 | 812 | 1,531 | 2,438 |
| Guatuso | 0 | 0 | 0 | 0 | 4,434 | 5,471 |
| Los Chiles | 0 | 0 | 0 | 0 | 9,631 | 13,831 |
| San Carlos | 0 | 0 | 0 | 0 | 13,049 | 5,152 |
| Sarapiquí | 0 | 0 | 0 | 0 | 7,057 | 3,875 |
| Upala | 0 | 0 | 0 | 0 | 6,884 | 3,319 |
| Pérez Zeledón | 0 | 0 | 0 | 0 | 0 | 2,646 |
| Total | 0 | 0 | 60 | 812 | 42,586 | 36,732 |

Source: SUTEL, General Directorate for FONATEL.



Table N° 100
Costa Rica. Investment executed through FONATEL's "Comunidades Conectadas" Program
by operator, 2012-2017

(Millions of Colones)

| Operator | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------------|----------|-----------|-------------|-------------|------------|-------------|
| ICE | 0 | 10 | 25 | 2123 | 5 | 1213 |
| Telefónica | 0 | 39 | 537 | 755 | 18 | 33 |
| Claro | 0 | 0 | 2516 | 0 | 909 | 724 |
| Total | 0 | 49 | 3077 | 2878 | 932 | 1971 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 101
Costa Rica. Investment executed through FONATEL's
"Comunidades Conectadas" Program, by cost classification, 2012 - 2017

(Data in millions of colones)

| Item | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------------|----------|-----------|--------------|-------------|------------|--------------|
| CAPEX | 0 | 10 | 25 | 2,123 | 5 | 1,213 |
| OPEX | 0 | 39 | 537 | 755 | 18 | 33 |
| CPSP's | 0 | 0 | 2,516 | 0 | 909 | 724 |
| Instalación | 0 | 49 | 3,077 | 2,878 | 932 | 1,971 |
| Total | 0 | 49 | 3,077 | 2878 | 932 | 1,971 |

Source: SUTEL, General Directorate for FONATEL

Table N° 102
Costa Rica. Investment executed through FONATEL's "Comunidades Conectadas" Program, by status,
2016 - 2017

(Features in millions of colones)

| Status | Dec-16 | Jan-17 | Feb-17 | Mar-17 | Apr-17 | May-17 | Jun-17 | Jul-17 | Aug-17 | Sep-17 | Oct-17 | Nov-17 | Dec-17 |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Active | 9,947 | 10,690 | 11,163 | 11,099 | 13,681 | 15,398 | 17,102 | 17,929 | 20,765 | 22,957 | 24,980 | 27,345 | 28,831 |
| Beneficiaries | 10,089 | 10,911 | 11,392 | 11,440 | 14,063 | 16,100 | 17,820 | 18,854 | 21,734 | 24,090 | 26,448 | 28,874 | 30,432 |
| Assigned | 2,698 | 2,263 | 2,132 | 2,132 | 3,295 | 2,782 | 2,472 | 4,205 | 5,731 | 5,320 | 6,299 | 7,306 | 6,780 |
| Contacted | 12,787 | 13,174 | 13,524 | 13,572 | 17,358 | 18,882 | 20,292 | 23,059 | 27,465 | 29,410 | 32,747 | 36,180 | 37,212 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 103
Costa Rica. Total amount of households and beneficiaries of FONATEL's "Hogares Conectados"
Program, 2015-2017

| Item | 2015 | 2016 | 2017 |
|-----------|------|--------|--------|
| Household | 0 | 10,089 | 30,432 |
| Persons | 0 | 32,890 | 98,600 |

Source: SUTEL, General Directorate for FONATEL.



Table N° 104
Costa Rica. Number of beneficiaries of FONATEL's "Hogares Conectados" Program, by Province
2016-2017

| Province | Dec 16 | Jan 17 | Feb-18 | Mar-18 | Apr 17 | May-18 | Jun-18 | Jul-18 | Aug 17 | Sep 17 | Oct-18 | Nov-18 | Dec-18 |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| San José | 3,259 | 3,791 | 3,907 | 3,774 | 4,756 | 5,295 | 5,791 | 6,088 | 6,913 | 7,413 | 8,232 | 8,865 | 9,178 |
| Alajuela | 1,721 | 1,974 | 2,044 | 1,988 | 2,460 | 2,977 | 3,288 | 3,392 | 3,796 | 4,119 | 4,440 | 4,868 | 5,229 |
| Cartago | 492 | 576 | 583 | 567 | 737 | 859 | 1,001 | 1,081 | 1,231 | 1,410 | 1,665 | 1,758 | 1,872 |
| Heredia | 510 | 442 | 471 | 443 | 893 | 1,290 | 1,539 | 1,603 | 2,052 | 2,241 | 2,444 | 2,758 | 2,942 |
| Guanacaste | 1,672 | 1,845 | 1,904 | 1,804 | 2,175 | 2,310 | 2,492 | 2,755 | 3,156 | 3,576 | 3,774 | 4,073 | 4,186 |
| Puntarenas | 1,624 | 1,543 | 1,718 | 1,720 | 2,083 | 2,304 | 2,537 | 2,671 | 3,158 | 3,742 | 4,121 | 4,563 | 4,904 |
| Limón | 812 | 740 | 765 | 803 | 959 | 1,065 | 1,172 | 1,264 | 1,428 | 1,589 | 1,772 | 1,989 | 2 121 |
| Total | 10,089 | 10,911 | 11,392 | 11,099 | 14,063 | 16,100 | 17,820 | 18,854 | 21,734 | 24,090 | 26,448 | 28,874 | 30,432 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 105
Costa Rica. Number of beneficiaries of FONATEL's "Hogares Conectados" Program, by Income Quintile,
2016-2017

| Wealth quintile | Dec 16 | Jan 17 | Feb-18 | Mar-18 | Apr 17 | May-18 | Jun-18 | Jul-18 | Aug 17 | Sep 17 | Oct-18 | Nov-18 | Dec-18 |
|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Quintile 1 | 9,832 | 10,631 | 11,095 | 11,099 | 13,161 | 14,625 | 16,012 | 16,847 | 18,884 | 20,545 | 22,218 | 23,896 | 24,995 |
| Quintile 2 | 256 | 279 | 296 | 0 | 901 | 1,474 | 1,807 | 1,982 | 2,414 | 2,854 | 3,305 | 3,920 | 4,283 |
| Quintile 3 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 25 | 436 | 691 | 925 | 1,058 | 1154 |
| Total | 10 089 | 10 911 | 11 392 | 11 099 | 14 063 | 16 100 | 17 820 | 18 854 | 21 734 | 24 090 | 26 448 | 28 874 | 30 432 |

Source: SUTEL, General Directorate for FONATEL.

Table N° 106
Costa Rica. Number of beneficiaries of FONATEL's "Hogares Conectados" Program, by
Telecommunication Services Operator, 2016-2017

| Operator | IIT 2016 | IIIT 2016 | IVT 2016 | IT 2017 | IIT 2017 | IIIT 2017 | IVT 2017 |
|-----------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Cabletica | 994 | 2,014 | 5,018 | 5,744 | 8,391 | 10,954 | 13,618 |
| Telecable | 6 | 5 | 2,124 | 2,147 | 3,741 | 5,067 | 6,059 |
| ICE | 27 | 305 | 1,237 | 1,697 | 2,245 | 3,467 | 4,694 |
| Tigo | - | 22 | 488 | 672 | 1,455 | 2,166 | 3,243 |
| Coopesca | - | 173 | 658 | 803 | 1,108 | 1,372 | 1,686 |
| Coopesantos | - | 166 | 458 | 591 | 745 | 896 | 948 |
| Coopeguanacaste | - | 56 | 106 | 121 | 135 | 168 | 184 |
| Total | 1,027 | 2,741 | 10,089 | 11,775 | 17,820 | 24,090 | 30,432 |

Source: SUTEL, General Directorate for FONATEL.



Table N° 107
Costa Rica. Investment executed through FONATEL's "Hogares Conectados" Program, by
operator, 2016-2017
(Millions of Colones)

| Operator | 2016 | 2017 |
|-----------------|------------|--------------|
| Cabletica | 420 | 1,811 |
| Telecable | 136 | 1,735 |
| ICE | 103 | 1,570 |
| Tigo | 0 | 188 |
| Coopesesca | 37 | 446 |
| Coopesantos | 38 | 304 |
| Coopeguanacaste | 0 | 6 |
| Total | 734 | 6,060 |

Source: SUTEL, General Directorate for FONATEL.

The background is a collage of teal geometric shapes. On the left, there is a white circuit board pattern. On the right, there are images of a laptop keyboard and a stack of books.

ACRONYMS

ACRONYMS

| | |
|------------------|---|
| A4AI | Alliance for Affordable Internet. |
| ARPU | Average Revenue per User. |
| BCCR | Central Bank of Costa Rica (<i>Banco Central de Costa Rica</i>) |
| CCSS | Costa Rican Social Security Fund (<i>Caja Costarricense de Seguro Social</i>) |
| CECI's | Smart Community Centers (<i>Centros Comunitarios Inteligentes</i>) |
| Cen Cinai | Centers of Education and Nutrition and Children's Centers for Integral Attention (<i>Centros de Educación y Nutrición y de Centros Infantiles de Atención Integral</i>) |
| CEPF | Parafiscal Special Contribution (<i>Contribución Especial Parafiscal</i>) |
| CGR | The Comptroller General of the Republic (<i>Contraloría General de la República</i>) |
| CPSP's | Public Services Delivery Centers (<i>Centros de Prestación de Servicios Públicos</i>) |
| DGC | General Directorate for Quality (<i>Dirección General de Calidad</i>) |
| DGF | General Directorate for FONATEL (<i>Dirección General de FONATEL</i>) |
| DGM | General Directorate for Markets (<i>Dirección General de Mercados</i>) |
| DWDM | Dense wavelength division multiplexing. |
| EBAIS | Comprehensive Basic Health Care Teams (<i>Equipos Básicos de Atención Integral en Salud</i>) |
| FTTx | Fiber to the X, generic term for the provision of last mile networks on fiber optics |
| FONATEL | National Telecommunications Fund (<i>Fondo Nacional de Telecomunicaciones</i>) |
| GB | Gigabyte |
| GSM | Global System for Mobile Communications. |
| HFC | Hybrid fibre-coaxial. Hybrid fiber and copper networks, those that use DOCSIS or similar technologies to offer their services. |
| ICE | Costa Rican Institute of Electricity (<i>Instituto Costarricense de Electricidad</i>) |
| IMAS | Joint Social Welfare Institute (<i>Instituto Mixto de Ayuda Social</i>) |

INEC National Institute of Statistics and Census of Costa Rica (*Instituto Nacional de Estadística y Censos*)

IP Internet Protocol: Set of rules and standards for digital data communication, classified on the Network Layer according to the international OSI model

IPTV Internet Protocol Television.

ISO International Standards Organization

Kbps Kilobits per second

LGT General Telecommunications Law, Law 8642

LTE *Long Term Evolution*: wireless broadband technology that is designed, mainly, to support the access of mobile phones and portable devices to the Internet

Mbps Megabits per second

MEP Ministry of Public Education

MH National Treasury (*Ministerio de Hacienda*)

MICITT Ministry of Science, Technology and Telecommunications of Costa Rica (*Ministerio de Ciencia, Tecnología y Telecomunicaciones*)

MIDEPLAN Ministry of National Planning and Economic Policy (*Ministerio de Planificación Nacional y Política Económica*)

MMDS *Multichannel Multipoint Distribution Services*.

MMS *Multimedia Messaging System*.

Off-net The origin of voice traffic or short messaging is a different network to the destination network.

On-net The destination of voice traffic or short messaging is the same network where the traffic originated.

PAPyP Annual Project and Programs Plan (*Plan Anual de Proyectos y Programas*)

PBAS Solidary Broadband Program (*Programa Banda Ancha Solidaria*)

PCC Connected Communities Program (*Programa Comunidades Conectadas*)

PCiC Connected Citizen Program (*Programa Ciudadano Conectado*)

PCPC Connected Public Centers Program (*Programa Centros Públicos Conectados*)

PEPC Connected Public Spaces Program (*Programa Espacios Públicos Conectados*)

PHC Connected Homes Program (*Programa Hogares Conectados*)

| | |
|--------------|--|
| PIB | Gross domestic product (Producto Interno Bruto) |
| PNDT | National Development Plan for Telecommunications (<i>Plan Nacional de Desarrollo de las Telecomunicaciones</i>) |
| PON | <i>Passive optical networks.</i> |
| QoSE | Quality of service experienced by the user |
| RPCS | Regulation of provision and quality of services (<i>Reglamento de prestación y calidad de servicios</i>) |
| SDH | <i>Synchronous Digital Hierarchy.</i> Synchronous digital hierarchy: protocol to transfer bit streams in a synchronized way over fiber |
| SMS | <i>Short Message Service.</i> |
| SUTEL | Superintendence of Telecommunications |
| TB | Terabyte |
| UIT | International Telecommunication Union: Specialized Organization of the United Nations Organization in charge of regulating telecommunications at international level between the different administrations and operating companies |
| VoIP | Voice over Internet Protocol |
| XDSL | Digital Subscriber line. Technologies that use the copper telephone platform for access |
| VoIP | Voice over Internet Protocol |
| XDSL | Digital Subscriber line. Technologies that use the copper telephone platform for access |



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