MINISTERE DE L'ECONOMIE NUMERIQUE ET DE LA POSTE

ARTCI

ITU Regional Workshop on ICT Statistics for Africa

Abidjan, Côte d'Ivoire
6-8 May2019

Other supply-side indicators

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Fixed wired network coverage

Households covered by a fixed wired network

To be reported from July 2018

1. Also known as cabled households or homes passed

2. Measures availability of but not necessarily the subscription to or usage of fixed network services

3. A household is covered if the service provider already provisions or could provision a wired connection within a short period of time (i.e. a few days) and without an extraordinary commitment of resources

Households covered by a fixed wired network (ii)

Examples of extraordinary commitment:

- installing or extending cable from local switching center, a DSLAM, CMTS, OLT, fiber node, optical splitter, FTTC cabinet, HFC node,
- building a duct
- installing poles
- leasing a line

EXCL. Fixed wireless, mobile nomadic and satellite networks

Households covered by a fixed wired network (iii)

Broken down by:

- Traditional public switched telephone network
- DSL (excl. VDSL)
- VDSL, VDSL vectoring
- CATV networks
- FTTP
- Other

The total indicator is not the sum of the sub-indicators

Households covered by a fixed wired network (iv)

Method of collection 1:

	PSTN	ADSL	VDSL	CATV	FTTP	OTHER	TOTAL
[redacted]							[redacted]
Municipality 2	100	400		1000	600		1000
[redacted]							[redacted]

11500 COUNTRY

Perfect overlap in all municipalities =>

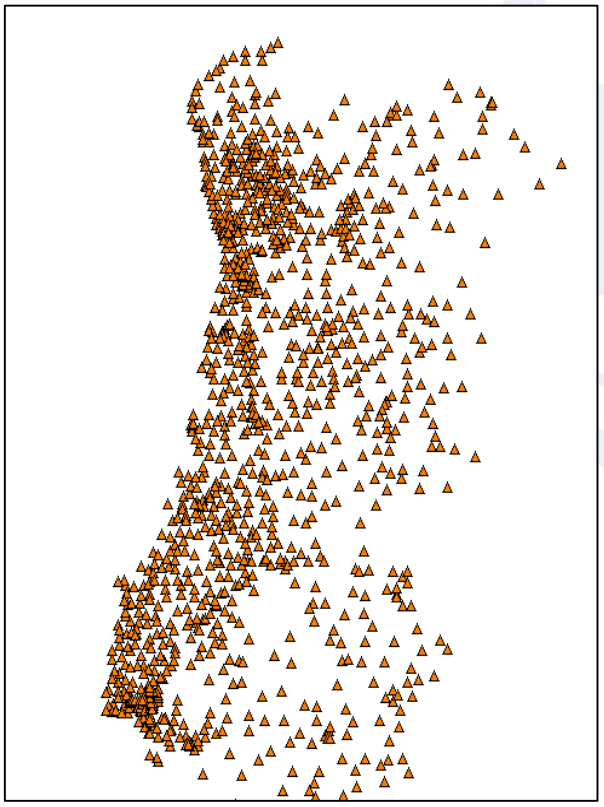
Max (PSTN; ADSL; VDSL;CATV; FTTP; Others)

By default, assume perfect overlap

Households covered by a fixed wired network (v)

Method of collection 2:

I. Collect database of geolocated network elements

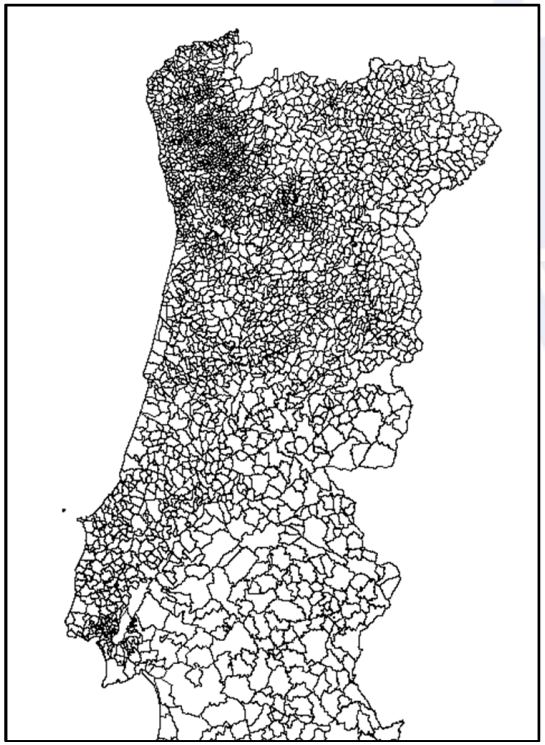


Code	LON	LAT	Network_Element	Cabled_HH
ALM	-9,14835549	37,90923906	01AA01	2120
ABO	-9,32315451	38,14457720	01AB01	1741
ABD	-9,39788471	38,14878173	01AD01	1836
ALF	-9,19675004	38,15196493	01AF01	2306
ALG	-9,21847829	38,11731024	01AG01	8062
ALH	-8,99445754	38,34385497	01AH01	1908
ALH3	-9,04404091	38,37313211	01AH03	2
ABI	-9,26383689	38,26011188	01AI01	3014
AJU	-9,24821257	38,14686610	01AJ01	49
AMA	-9,04330270	38,17409563	01AM01	2580
ALO	-8,77286899	38,17343871	01AO01	191
ALB	-9,15038204	38,18092789	01AQ01	0
AGU	-9,09744643	38,18817379	01AU01	1
ALV	-8,84618192	38,31722327	01AV01	24
AZE	-8,82465719	37,94089791	01AZ01	1
AZE4	-8,82915579	37,96486249	01AZ04	4418
BAR	-8,88386147	38,08200256	01BA01	0
BBA	-8,85619240	38,07935318	01BB01	745
BCH2	-8,81567762	38,02078216	01BC01	1230
BCH3	-8,82467187	38,01989378	01BC03	881
BOB	-8,90590214	38,22665975	01BO01	2145
BUC	-8,92747876	38,31805748	01BU01	1202
BUC2	-8,93095233	38,36864293	01BU02	835
CAP	-9,00474107	38,08274813	01CA01	9
CAC	-9,09629804	38,18285139	01CC01	974
CCA	-9,00011617	38,03660162	01CH01	3919
CCA2	-8,97642095	38,00291016	01CH02	2192
CCA3	-8,96405397	38,00203951	01CH03	0
CLR	-9,24756348	38,22408620	01CL01	34

Households covered by a fixed wired network (vi)

Method of collection 2:

II. Obtain a digital map of the country/database with number of households at the lowest possible level of granularity

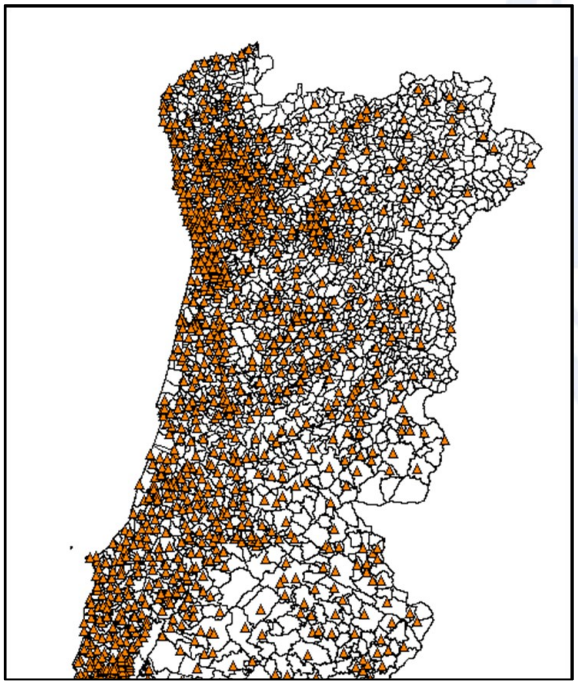


Parish_Code	Parish_name	AREA_T_HA	Populatio	Households
10103	Aguada de Cima	2839.310000	4013	2014
10109	Fermentelos	858.200000	3258	1463
10112	Macinhata do Vouga	3195.440000	3406	1727
10119	Valongo do Vouga	4320.110000	4877	2155
10121	Águeda e Borralha	3602.930000	13576	6900
10122	Barrô e Aguada de Baixo	1019.010000	3209	1462
10123	Belazaima do Chão, Castanheira do Vouga e Agadão	8809.030000	1611	783
10124	Recardães e Espinhel	1991.780000	6036	2751
10125	Travassô e Óis da Ribeira	1112.190000	2305	1034
10126	Trofa, Segadães e Lamas do Vouga	1606.810000	4630	2018
10127	Préstimo e Macieira de Alcoba	4172.640000	808	494
10202	Alquerubim	1535.860000	2381	1074
10203	Angeja	2125.170000	2073	979
10204	Branca	3028.860000	5621	2558
10206	Ribeira de Fráguas	2674.540000	1713	753
10209	Albergaria-a-Velha e Valmaior	4699.640000	10568	5487
10210	S. João de Loure e Frossos	1818.420000	2896	1443
10304	Avelãs de Caminho	644.870000	1252	621
10305	Avelãs de Cima	4057.800000	2185	977
10307	Moita	3417.610000	2484	1215
10309	Sangalhos	1690.420000	4068	1959
10310	S. Lourenço do Bairro	1538.310000	2414	1252
10312	Vila Nova de Monsarros	2372.040000	1713	857
10313	Vilarinho do Bairro	2556.330000	2764	1582

Households covered by a fixed wired network (vii)

Method of collection 2:

III. Overlay the two sets of data for each operator and technology using GIS tool



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10204	Branca	3028.860000	5621	2558	24
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IV. Aggregate among operators as in method 1

M2M subscriptions

Machine to machine subscriptions

- Indicator collected from 2016:

  mobile-cellular machine-to-machine subscriptions that are assigned for use in machines and devices (cars, smart meters, consumer electronics) for the exchange of data between networked devices, and are not part of a consumer subscription.

  For instance, SIM-cards in personal navigation devices, smart meters, trains and automobiles should be included. Mobile dongles and tablet subscriptions should be excluded.

Bundled telecommunication services

Definition of bundle

- A bundle is a commercial offer meeting all of the following conditions:
  1. A commercial offer that includes two or more of the following services: fixed telephone, mobile voice, fixed broadband, mobile broadband, pay TV
  2. marketed as a single offer, with a single invoice and with a single price for the set of services included in the bundle
  3. subscribed under conditions that cannot be obtained by adding single play offers together

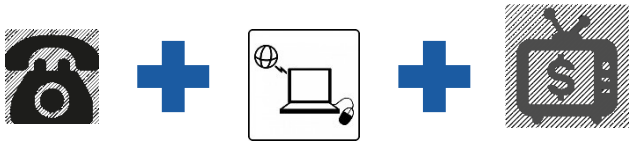
ITU indicators on bundles

Collected from 2015:

1. Subscriptions to fixed-broadband and fixed-telephone bundles

   Subscriptions that include additional telecommunication services – such as triple play subscriptions including fixed telephony, fixed broadband and pay TV – should be excluded

2. Subscriptions to fixed-broadband, fixed-telephone and pay-TV bundles



Prospective needs and evidence of convergence

Convergent bundles

The 8th EGTI (2018) meeting agreed to discuss new indicators to monitor convergence trends. It was observed the **relevance of fixed-mobile bundles,** though this varies on a per country basis.

The proposal is to include an indicator relating to bundles in the ITU questionnaires **to capture convergence trends: fixed + mobile services**

QoS indicators

Quality of Service indicators (QoS)

EGTI discussed during last years the **Quality of Service** (QoS). As an outcome of the discussions, the indicators on QoS collected in the ITU questionnaire were reduced to the following three:

(1) mobile-cellular unsuccessful call ratio;

(2) mobile-cellular dropped call ratio; and

(3) service activation time for fixed-broadband services.

Mobile-cellular unsuccessful call ratio (i146u)

- *Mobile-cellular unsuccessful call ratio* refers to the ratio of unsuccessful mobile-cellular calls to the total number of mobile-cellular call attempts in a given year. An unsuccessful call is a call attempt to a valid number where (a) the call is not answered, (b) there is no called party busy tone, and (c) there is no ringing tone on the caller's side within 40 seconds from the moment when the last digit of the called number is received by the network. The caller must be within coverage of a mobile-cellular network.

Mobile-cellular dropped call ratio (i146d)

- *Mobile-cellular dropped call ratio* refers to the proportion of incoming and outgoing mobile-cellular calls which, once they have been correctly established and therefore have an assigned traffic channel, are dropped or interrupted prior to their normal completion by the user, the cause of the early termination being within the operator's network.

Service activation time for fixed (wired)-broadband service (in days) (i147t)

- *Service activation time for fixed (wired)-broadband service* refers to the time from the date of application to the date of service activation. The average service activation time for all new applications received within the given year should be provided.

Revenue and investment

Methodology

- ITU Handbook
- EGTI reviewed the definitions in 2012
- Chapter 4 in MISR 2012 and Ch 3 in MISR 2018 analysed revenue and investment data
- Input from international organizations

+

Methodological note


Methodology for the collection of revenue and investment data on telecommunications

Background

This methodological note provides detailed guidelines for the collection of internationally comparable data on revenue from, and investment in telecommunication services.[1] It covers three main indicators: (i) *Revenue from all telecommunication services*; (ii) *Revenue from mobile services*; and (iii) *Annual investment in telecommunication services*. The methodology proposed reviews and complements the information on these indicators included in the ITU Handbook for the Collection of Administrative Data on Telecommunications/ICT[2] by integrating the outcomes of the discussions held in 2012 within the ITU Expert Group on Telecommunication/ICT Indicators (EGTI),[3] as well as additional contributions from international organizations.[4] It also benefits from the experience gained from ITU's 2012 global data collection of these indicators from operators' annual reports, and the lessons learned about the international harmonization of these data.

ITU has been collecting data on revenue from telecommunication services since 1960,[5] and on investment in telecommunication services since 1985. ITU data are collected through annual questionnaires sent to national administrations that collect these indicators from operators, and aggregate the data at national level. Revenue and investment data provide an overview of the economic dimension of the telecommunication sector, its structure and the capital expenditure flows that underpin telecommunication developments.

Revenue and investment data from telecommunication operators are widely available through operators' annual reports. In addition, data for the telecommunication sector aggregated at a national level are often collected by regulators or ministries as part of their regular data collection exercises, and also made public. Even if not published, data are usually available internally through administrative records. Confidentiality issues are in most cases overcome by assuring data confidentiality at an operator level and publishing only aggregate values for the sector. In those countries where unquoted

[1] Throughout the document, the terms 'telecommunications' and 'telecommunication services' are used interchangeably.
[2] Available at: http://www.itu.int/pub/D-IND-ITC_IND_HBK-2011
[3] EGTI is ITU's expert group on indicators for the collection of administrative data on telecommunications/ICT (i.e. data collected from operators). It is open to all ITU Members and experts in the field of ICT statistics and data collection. It works through an online discussion forum (http://www.itu.int/ITU-D/ict/EgtiDiscussion) and reports periodically back to the World Telecommunication/ICT Indicators Symposium (WTIS).
[4] The following international organizations provided comments on this note: the European Commission, IMF, OECD and UNCTAD.
[5] In the case of revenues from mobile services, ITU has been collecting data since the mid-1980's, because previously mobile services had little relevance in terms of revenues.

1

Revenue

- Since 1960, revenue from telecommunications
  On average 141 economies reported

- Since mid-1980's, revenue from mobile services
  139 economies reported

Issue: harmonization of data reported in view of international comparisons

Revenue from all telecommunication services

- Revenue from all telecommunication services refers to revenue earned from retail fixed-telephone, mobile-cellular, Internet and data services offered by telecommunication operators (both network and virtual, including resellers) offering services within the country during the financial year under review.
- It includes retail revenues earned from the transmission of TV signals
- It excludes revenues from TV content creation.
- Any deviation from the definition should be specified in a note, including clarifications on what TV revenues are included/excluded (e.g. IPTV, cable TV, pay satellite and free-to-air TV).

Revenue

- Breakdowns: Total / mobile →
- Main issues:

Additional breakdowns not compa-rable because of ≠ revenue allocation

	INCLUDED
Retail revenues from residential customers	YES
Retail revenues from business customers	YES
Wholesale revenues, e.g. interconnection revenues	NO
Revenues from resellers and mobile virtual operators	YES
VAT and excise taxes	NO
Corporate taxes and administrative fees, e.g. numbering fees	YES (not to be deducted from total revenues)
Revenues from device sales and rents	NO
Revenues from added value services, e.g. premium SMS	YES

Investment

- Only total investment → Difficult to allocate investment to services
- Definition of investment

≈ gross fixed capital formation (as in SNA)

investment made by entities providing telecommunication networks and/or services (including fixed, mobile and Internet services, as well as the transmission of TV signals) for acquiring or upgrading fixed assets (usually referred to as CAPEX) less disinvestment owing to disposals of fixed assets

Investment (cont.)

- Main issues:

	INCLUDED
Additions less disposals of tangible fixed assets	YES
Additions less disposals of intangible fixed assets	YES
Investment from national-owned operators in the country	YES
Investment from foreign-owned operators in the country	YES
Investment from national-owned operators outside the country	NO
Licence fees	NO
R&D expenditures	YES

Spectrum indicators

New spectrum indicators

- a subgroup in EGTI produced during 2018 a proposal on how to obtain indicators of spectrum available worldwide

- in the last EGTI- 2018 meeting the proposal to introduce two indicators to measure spectrum “capacity” was discussed and adopted.

- the view is that spectrum should be used efficiently to promote the development of ICT services

(1) Spectrum is first **allocated** to a given service

(2) in a subsequent phase, it may be **assigned** to a licensee- a firm or institution- over a geographic area to provide a specific service.

hence,

spectrum licensed (assigned) $\leq$ ***spectrum offered (allocated)***

Indicator 1:

Amount of spectrum **offered** for IMT systems, in MHz

Total spectrum, in MHz, ***made available for use*** (i.e. **allocated**) through any formal national publication, such as the National Frequency Plan, for IMT systems, including any of the air interfaces in accordance with ITU-R Recommendations concerning these standards for mobile communications.

This indicator is broken down by the following bands (indicated in MHz):

(1) Block < 1 GHz
(2) Block 1 GHz- 6 GHz
(3) Block > 6 GHz

Clarifications and scope:

1) This indicator refers to spectrum allocated nationally as identified in National Frequency Plans and other documents that can be considered formal announcements of allocation

2) The IMT definition encompasses all IMT versions (IMT-2000, IMT-Advanced, IMT-2020)

3) Official documents may use the term IMT or other commercial names, such as 3G, 4G or 5G. All these different denominations should be considered when collecting the data for this indicator

4) It should be noted that for all bands listed, countries may allocate and license the full band, or parts thereof depending on the Radio Regulations, Regional and National Allocations.

5) In order to compare the data submitted for this indicator across countries, the "Amount of spectrum offered for IMT systems, in MHz" **will be divided by the spectrum identified for IMT systems in the Radio Regulations (RR) on a per Region basis**.

$$Indicator\ 1_i = \frac{amount\ spectrum\ \boldsymbol{allocated}\ in\ band_i}{recommended\ spectrum\ by\ ITU\ in\ band_i}$$

i= bands

Indicator 1: Amount of spectrum offered for IMT systems, in MHz

This indicator is broken down by the following bands (indicated in MHz):

1- **Block < 1 GHz:**
   a. 450 MHz (450-470)
   b. UHF band (470-608)
   c. 600 MHz (610-69/698)
   d. 700 MHz (698-790/806)
   e. 800 MHz (790/806-902)
   f. 900 MHz (902-960)

2- **Block from 1 to 6 GHz:**
   a. L-band (1427-1518)
   b. 1.7/1.8 GHz (1710-1885)*
   c. 1.9 GHz (1885-2025)
   d. 2.1 GHz (2110-2200)
   e. 2.3 GHz (2300-2400)
   f. 2.5 GHz, C-band (2500-2690)
   g. 3300-3400
   h. 3400-3500
   i. 3500-3600
   j. 3600-3700
   k. 4.8 GHz (4800-4900)
   l. 4.9 GHz (4900-4990)

3- **Block > 6 GHz (WRC-19):**
   a. 24 250-27 500
   b. 31 800 -33 400
   c. 37 000 -40 500
   d. 40 500 -42 500
   e. 42 500 -43 500
   f. 45 500-47 000
   g. 47 000-47 200
   h. 47 200-50 200
   i. 50 400-52 600
   j. 66 000-71 000
   k. 71 000-76 000
   l. 81 000-86 000

Indicator 2:

Amount of spectrum licensed for IMT systems, in MHz

Total spectrum, in MHz, **assigned** nationally **for use** for IMT systems, including any of the air interfaces in accordance with ITU-R Recommendations concerning these standards for mobile communications. Assignment implies granting a specific block in a specific frequency band to a firm or institution (a licensee).

This indicator is broken down by the following bands (indicated in MHz):

(1) Block < 1 Ghz
(2) Block 1 GHz- 6 GHz
(3) Block > 6 GHz

Clarifications and scope:

1) This indicator refers to **national spectrum that has been assigned to a given operator as a result of an assignment process** (e.g. auction, beauty contest….).

2) The IMT definition encompasses *all IMT versions* (IMT-2000, IMT-Advanced, IMT-2020).

3) Official documents may use the term IMT or other commercial names, such as 3G, 4G or 5G. All these different denominations should be considered

4) for all bands listed, ***countries may allocate and license the full band, or parts*** thereof depending on the Radio Regulations, Regional and National Allocations.

Method of collection:

Data can be collected from the national administration responsible for licensing spectrum, such as the telecommunication regulator, the ministry or another public administration in charge of spectrum management.

In addition, data are often publicly available through press releases informing of the outcomes of spectrum assignment processes.

Relationship with other indicators:

This indicator is related to the indicator “Amount of spectrum offered for IMT systems, in MHz”. Spectrum is first allocated to a given service and, in a subsequent phase, it may be assigned to a licensee. As a result, “Amount of spectrum licensed for IMT systems, in MHz” should be lower than or equal to “Amount of spectrum offered for IMT systems, in MHz”.

The indicator is a *relative* measure:

In order to compare the data submitted for this indicator across countries, the "Amount of **spectrum licensed** for IMT systems, in MHz" **will be divided by the spectrum identified for IMT systems in the Radio Regulations (RR) on a per Region basis**.

In the calculation of the spectrum identified for each Region, each band will be considered as identified for IMT systems for the Region based on the percentage of countries in the Region having identified a band for IMT systems in the RR footnotes.

$$Indicator\ 2_i = \frac{amount\ spectrum\ licensed\ in\ band_i}{recommended\ spectrum\ by\ ITU\ in\ band_i}$$

i= Bands

Total spectrum, in MHz, assigned nationally for use for IMT systems, including any of the air interfaces in accordance with ITU-R Recommendations concerning these standards for mobile communications.

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   e. 42 500 -43 500
   f. 45 500-47 000
   g. 47 000-47 200
   h. 47 200-50 200
   i. 50 400-52 600
   j. 66 000-71 000
   k. 71 000-76 000
   l. 81 000-86 000

More information:

http://www.itu.int/ict

indicators@itu.int