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372/13.08.2015 .

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1.	8
1.1.	8
1.2.	11
2.	12
2.1.	12
2.2.	13
2.3.	14
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IV.	146
1.	147
1.1.	147
1.2.	147
1.2.1.	149
1.3.	156
1.4.	166
2.	167
2.1.	168
2.1.1.	169
2.1.2.	175
2.2.	176
2.2.1.	.....	176
2.2.2.	.....	190
2.3.	.....	191
2.4.	.....	209
2.4.1.	.....	209
2010 – 2013 . (	.....	209
) .....	.....	216
2.4.2.	.....	216
V.	.....	219
1.	.....	219
1.1.	.....	219
1.2.	.....	221

1.2.1.	,	-	
	(FTTx).....		221
1.2.2.	,		
	/	-	
		-	
1.2.3.	,		232
	,		
1.2.4.	.....		234
	.....		237
1.3.	.....		242
1.4.	.....		243
2.	.....		243
2.1.	.....		243
2.2.	,		
			244
2.2.1.	.....		244
2.2.2.			.. 248
2.2.2.1.	,		
	.....		248
2.2.2.2.	,		
			..... 253
2.2.2.3.	.....		253
2.2.3.	.....		255
2.2.4.	.....		255
2.2.5.	.....		256
3.	.....		257
VI.	.....		259
1.	.....		259
2.	.....		259
3.	.....		263
4.	.....		264
4.1.	.....		264
4.1.1.	.....		265
4.1.1.1.	.....		265
4.1.1.2.	(
	).....		265
4.1.2.	.....		266
4.1.2.1.	.....		266
4.1.2.2.	(
	).....		267
4.1.3.	.....		267
4.1.3.1.	.....		267

4.1.3.2.	(	268
5.	)	269
5.1.		269
5.2.		270
5.3.		270
5.3.1.		271
5.3.2.		272
5.3.3.	, . .	275
5.3.4.		276
5.3.5.		276
5.3.5.1.		277
5.3.5.2.	()	278
5.3.6.		278
5.4.		279
5.4.1.		279
5.4.1.1.	((PSTN/ISDN),	
FTTC/xDSL)		279
5.4.1.2.		280
5.4.1.3.		284
5.4.2.		287
5.4.3.		289
5.4.3.1.	, FTTC/xDSL	289
5.4.3.2.	()	291
5.4.3.3.	()	291
5.4.3.4.		293
5.4.4.		293
5.4.4.1.		293
5.4.4.2.	()	296
5.4.4.3.		
1603/12.07.2012 .	703/30.10.2014	298
5.4.5.	, ,	
5.4.5.1.		299
5.4.5.2.		300
5.4.6.		311
5.4.6.1.		313
5.4.6.2.		313
5.4.6.3.		316
5.4.6.4.		318
VII.		319

1.	319
1.1.	319
1.2.	320
1.2.1.	- (FTTx) ,	320
1.2.2.	/ - - ,	322
1.2.3.	325
1.3.	325
1.4.	326
2.	326
VIII.	330
IX.	332

(,)

()

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)

() 2007/879/

17

(4 5

2007 .

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(3)

(3)

ex-ante

9

2014 .

ex ante,

(2010 – 2013 .)

V

VII

V

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✓ ;
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✓ ,
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VI . VII ,
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1.1.

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1998 .

(*acquis communautaire*)

' " (") . ,

ex ante

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2002/21/ , .16(6)

. 15(3) 2002/21/

. 15(1)

() (4
5 2007/879/ 17 2007 .

2007/879/ / 2007 .)).

() 9 2014

ex ante

2002/21/

2014 .)

(2014/710/EC /

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3)

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2014 .),

2007 .

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2014 .),

2007 .

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4:

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2007⁶ .

6

2007 .,

2014 .).

2007 .,

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2007 .

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2007 .

3

2014 .,

2014 .

2014 .

ex ante

15,

3

2002/21/

()

¹ Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services (2002/C 165/03)

² L 251 25.09.2010 .

³ L 251 21.09.2013 .

() 1211/2009, .3(3),
 , - ,
 . :

- BoR (14) 73 BEREC Common Position on geographic aspects of market analysis (definition and remedies);
- BoR (12) 128 Revised BEREC Common Position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant market for wholesale broadband access (WBA);
- BoR (12) 127 Revised BEREC Common Position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market;
- BoR (10) 09 BEREC Report on self-supply.

1.2.

(). / ,
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 (. . .89 13.11.2012 .)().
 , / , *ex ante*
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 .43 , .1 , ,
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 , (.43 , .2).
 .19 2002/21/ ,
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2. , / ,

. 16 / , , *ex ante* , . 15
. 152, . 150-157 , . 1 ,

2014 .

. 3, . 1

2014 .

ex ante
2014 .,

. 3, . 2

2.1.

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. 4).

(. 152, . 2

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(. 5).

2014 .

(.4, .4).

(.10):

1. ;
2. / .

(, , , ,).

. 152, . 5 6

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1. ,
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 3. ;
- .1 .

2014 .

, . 152, . 5

2.2.

, ... (. 154, . 2).

, , ...

, , (\$1, . 51), .14, 2).

ex-ante

4

39/23.01.2014 .,

3

3 ,

2014/61/

1

2014/61/
2016 .,
1 2016 .

2014/61/

(. 1(4)

2014/61/).

2014/61/
2002/21/

2014/61/

2002/19/ .

4 .1

2.

2.1.



FTTC/xDSL);



”



. IV.6,



. 1.1.6.

2.2.



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/ ” , VI ”
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 VI ” - . 5.4.5.2.
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, VI, . 2,
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 IV V
 , VI
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2.3.

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2.3.1.

246/22.02.2011 .

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2.3.2.

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2.3.3.

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NGA),

NGA

”

”;

2.3.4.

2.3.5.

.2.3.1.

2014/61/ ”

2002/21/

767/23.07.2009 .⁵).

1119 18.10.2010 .⁶).

246/22.02.2011 .

⁵ <http://crc.bg/section.php?id=705&lang=bg>

⁶ <http://crc.bg/section.php?id=825&lang=bg>

, ,
 (associated facilities), . .
 (§ 1, . 15
).
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 (. 150),
 (),
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 (§ 1, . 8),
 (. 174, . 1, . 1 . 6).
 2014 . ,
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 2014/61/ ,
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 2014/61/ (.
 01 2016 .)
 13 .
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 2014 . , (.
 555/19.08.2014 . ,)
 3. , . 42 .
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⁷ . 54 . 42

⁸ FR/2008/0780, EE/2009/0942, PL/2012/1364.

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 . 35, . 6, . 2 ,
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 246/22.02.2011 .
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 . 42 , . 7(9) 2002/21/ ,
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 . 42 , ,
 . 35, . 6 , . 60, . 1 , . 4(1) 2002/21/ .
 35, . 6, . 3 , ,

9

10

IV, . 1

9 IV „
10 . 115

„, . 1.

2.

1.

ADSL ;
ADSL
ADSL – 24 Mbps;
ADSL
ADSL
ADSL
(FTTx, CATV LAN)”.
ADSL
(46%¹¹ 55%¹²);
ADSL
ADSL
(2010-2013 .)
DSL
25,5%
ADSL ”;

¹¹ 38, E-Communications Household Survey (Special Eurobarometer 396, fieldwork February – March 2013)
¹² 40, E-Communications Household Survey (Special Eurobarometer 414, fieldwork January 2014)

- ADSL

(FTTx, CATV LAN),

ADSL

FTTB FTTH

ADSL
2010-2013

ADSL

ADSL

ADSL

40%

ADSL

LAN).

(FTTx, CATV

ADSL

ADSL

ADSL

ADSL

•

„NUTS“¹³.

(NUTS2)

14

•

),

”

15

(20 22),

¹³ () 1059/2003 26 2003 .

¹⁴ .4 (. . .50 30 2008 ., . . .47 23

2009 ., . . .82 16 2009 ., . . .93 24 2009 ., . . .

.82 26 2012 ., . . .66 26 2013 ., . . .22 11 2014 ., . .

.98 28 2014 .)

¹⁵ “Account has to be taken of the scope of the potential SMP operator's network and whether that potential SMP operator acts uniformly across its network area or whether it faces appreciably different conditions of competition to a degree that its activities are constrained in some areas but not in others.”, Explanatory note, accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, p. 13

30 Mbps

. 2.4.1.

IV,

„... [23.5%]

25%,

ADSL

.2. ”

ADSL

VI

(ADSL)

(. 7),

. 3 :

.1. ,

1.

2014 .,

2014 .,

304/19.06.2014 .

(FTTx)

2.

3

3

3 (

25%;

ADSL

4.2.2.1
3

FTTC/VDSL).

(FTTH, FTTB

– FTTH FTTB,

ADSL

ADSL
2013 .

).

40%,

(10 29,99 Mbps),
(52%

ADSL

2013 .),

(

(NGA)".

),
34

(

2013/466/

11

()

(. 14, . 1)

PSTN/ISDN

PSTN/ISDN

ASDL

PSTN/ISDN

PSTN/ISDN

. 157

3

3

”
PSTN/ISDN

17

()

1.2.

17

. 7

: ”

(ADSL)

1.3.

FTTC/xDSL,

V, . 2.2.2.1
2013 .

2009 .

.2.

2.1.

✓

. 166

✓

. 157, . 1 . 2

. 157, . 1,

3 .

VI, . 5.3

3 :

.1.

.1.1.

1.1.1.

- . IV.1.1.6
” ”

:
: „1.1.6.

- . IV.1.2.1.

. 151
: ”

”
.”
. IV. 1.2.1.

. 216, . 4

. ., .1.1.

PSTN/ISDN

(backhaul),

”

”

18

. IV.1.1.6

. IV.1.2.1.

.VI.4.4.1.1

：“

”

”

.”

. IV.1.2.1.

246/22.02.2011 .,

(195/14.03.2013 .,

1361/30.05.2012 .),

18 .21

(... first mover advantage).

IV.1.2.1.

BoR (12) 127¹⁹

216, . 4

216, . 4

174, . 2

1.1.2.

1.1.2.1.

246/22.02.2011 .,

246/22.02.2011 .,

NGA

(FTT /F).

40%

(FTT /F).

¹⁹ BoR (12) 127 Revised BEREC Common Position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market, . 11.

246/22.02.2011

FTTH/FTTB

NGA

FTTH/FTTB

NGA

FTTH

FTTB

” FTTP
.V.1.2.1

”

FTTP

”

”

.V.1.2.1

”

”

F

WDM

”

”

”

1.1.2.2.

246/22.02.2011 .,

. V. .1.9.6.

2013/466/ ,

. 51

69.

NGA

. 282, . 1

1.1.2.3.

-

-

-

- (-); - , ,
- , ,
246 /22.01.2011 ,,
100%
FTTH/FTTB
FTTC/xDSL.

1.1.3.

„1.2.2. „

IV.1.2.2.

3 3 :

1.2.2.

(.1(4) 2014/61/).

✓

246/22.02.2011 .

. V. . 1.4.3. V. . 1.4.4.

✓

246/22.02.2011 .

. V. . 1.4.3. 1.4.4.

. 282, . 1

.V. .4.1.3

246/22.02.2011 .

. 282, . 1 .²⁰,

246/22.02.2011 .

(. 3.1.2. 2).

(,) ,

, . 40 . 153 ,

.V. 4.1.3 246/22.02.2011 ., . V 4.2.3
769/12.12.2014 .

1.2.3.

NGA

•

15-20)

•

(dark fibre)

3

Digital Agenda for Europe.

. IV.1.4.2.

.V.1.1

1.2.4.

. IV.1.4.1. . IV.1.4.2.

- . IV.1.4.1.

: ”

- . IV.1.4.2.

: ”

”;

.”

. IV. 1.4. . IV. 1.4.

2

30

1603/2012

. 3.3 . 3.3.2.1.

2014

21
2014, TDC A/S v Teleklagenævnet, C-556/12).

.2.

2.1.

. IV.3.1

. IV.3.4

. IV.3.1.

”.

. IV.3.4.

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)
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)
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).”

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. 3.4.

. IV.3.1.

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. 3.4.,

2.2.

. IV.3.1 . IV.3.4

(. 24

2013).

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V , . 5.4.3

2.3.

(/EoI).

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NGA

48 49;)

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2013 .

2013 .

5.4.1.2

V , .

2.4.

. IV.3.1 . IV.3.4

„3.1.

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FTTC/xDSL, „

„3.4. „

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. IV.3.4

. IV.3.1

2013 . ()

.3. ()

3.1. , . IV.3.2.

, , . 167 ,

246/22.02.2011 .

. 167, . 1

. 167 .

3.2. , (. V.2.2.)

. IV.3.2.

NGA

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V, . 5.3.2

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. 24 NGA

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V . 4.3

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.4.1.

4.1.1.

DSL

. 9 (4)

2002/19/
. 12

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II

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. 167, . 6

. 3, . 3,

” ”, ” ” ” ” ” ”, . 4

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4.1.2.

V, . 5.4.1.2.

.4.2.
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4.2.1.

.V.2.2.

246/22.02.2011 .

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2014 .

3 3 .

4.2.2.

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4.2.1.,

4.2.3.

30.11.2012 .

(35), -

17 2005 .

(17),

17

35.

.4.2.1.

35,

. 10, . 2

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§ 1, . 5 35, „ ”
HDPE), (High Density Polyethylene -

. 10, . 2 35

§ 1, . 5 35.

²²

35

.5.

5.1. , , . IV.5.

. 157

²² https://www.mtitc.government.bg/upload/docs/Table_obshObs_NarIzgrazhdaneMmrezhi.doc

. 157 . 151, . 2

1882/23.08.2012 .,

–

1361/31.05.2012 .

. 155, . 2 . 156, . 2

1361/31.05.2012 .

1361/2012 . 1362/2012 .

1361/2012 . 1362/2012 .

1361/2012 .

X.5.1.
23

1361/31.05.2012 . . 6.1.7.

. IX.5.1.
195/14.03.2013 .

. 157

. 157

. 157

. 157

,
1361/31.05.2012 . 157 , 195/14.03.2013 . 16(6)
2002/21/ . ,

,
1361/31.05.2012 ., 195/14.03.2013 . ,

157 . , ,

.VI.4.4.5.1. , ,

. 151, . 2 ,

1882/23.08.2012 .,

1361/31.05.2012 .,

1882/23.08.2012 .

1882/23.08.2012 .,

. 155, . 2 . 156, . 2

246/22.02.2011

195/14.03.2013 .

1361/31.05.2012 .

1362/31.05.2012 .

(1361/31.05.2012 ., 1362/31.05.2012 ., 1954/27.09.2013 ., 195/14.03.2013 .
246/22.02.2011 . -).

1362/31.05.2012 .

IX.5.1. X.5.1.

1361/31.05.2012 .

195/14.03.2013 .

1361/31.05.2012 .

195/14.03.2013 .

2013/466/

retail minus

6.1.3

Digital Agenda Scoreboard 2014

0,53

2014 . (19,30¹)

2014 . (36,70

2014 . 7,92
0,53,

4,16

1,25

2014 .,

.6.2.

6.2.1.

246/22.02.2011 .

32,
1603/2012 . , ,
, 25 20

6.2.2.

1603/2012 . ,
-
246/22.02.2011 .
(
) . 246/22.02.2011 .
1603/2012 . ,)
)
" "

1603/2012 .,

25

20%

25

3%

10%

20%.

1603/2012

$$5,43 \dots (67.2 - 3 * 20.6 = 67.2 - 61.73 = 5.43),$$

$$0,14 \dots 0,09 \dots 32 \dots 25,$$

20,00 .

- 12,00 .

$$I \therefore 20,00 \text{ .} + 22 * 12,00 \text{ .} = 284,00$$

”

1 , 45,00 „ . 3.4.

,

11,00 .

17,00 . 60,00 .

,

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”

”

(,)

2015-2017 . : 2015 . - 0,1%; 2016 . - 1,1%; 2017 . -1,6%.

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. 6.2.1. ,

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1603/2012 .

2014 .

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246/22.02.2011 .,

,

20%

2013/466/

2012 .,

15 ;

40 ,

Analysis Mason (International benchmark of fixed access services)

2011 . 2014 . ()
30%.

2012 . 246/22.02.2011 .
(2011 .).”.

(2011 . -2014 .),

. 14 . NGA .6.2.1 .6.2.2. 246/ 2011 .

LRIC

2.
186/21.04.2015 .

. 151, . 2

3 3 .

” ” ” ”

4

1.

”

” ”

”

”

30%.

. 150

”

“

2013 .

” “

09.10.2013 .,

25

” 2015 .

2.

2014/61/ .

. 295

() – -501/09.05.2013 .

25

20.11.2013 .

2014/61/

. 295

§ 5, . 31

3.

()

26

4.

3 3 ,

. 42

27

²⁶ - . III. .2.3, . 19-23
186/21.04.2015 .

²⁷ - . III. .3, . 23-25
186/21.04.2015 .

2013 .

186/21.04.2015 .,

198
186/21.04.2015 .,

.1.

(CATV, LAN FTTx).

ADSL

ADSL

– 24 Mbps.

²⁹ <http://www.mtel.bg/fix-internet-pokritie>

186/21.04.2015 . 20 Mbps, 36%, 10
29,99 Mbps, 50%.

ADSL
CATV
186/21.04.2015 .

ADSL
ADSL.

ADSL LAN FT
ADSL LAN FT
ADSL FT
ADSL F

ADSL
(CATV, LAN FTTx)

186/21.04.2015 ., . 16

20 Mbps, . 16 186/21.04.2015 .,

ADSL 20 Mbps, 29,99 Mbps.

. 144 769/12.12.2014 ., 186/21.04.2015 .,

186/21.04.2015 .

ADSL IV CATV

186/21.04.2015 . . 1.3. CATV

ADSL F

20³⁰), ADSL (FiberNet 15 (VIVACOM Net 15 FiberNet 20³¹) VIVACOM Net

³⁰ <https://www.vivacom.bg/bg/residential/ceni-i-uslugi/internet/domashen-internet/#tab-vivacom-coverage>

³¹ <https://www.vivacom.bg/bg/residential/ceni-i-uslugi/internet/domashen-internet>

(. 14

186/21.04.2015 .)
ADSL, CATV, LAN FTTx
. IV.2.2.1³²

1 Mbps.

ADSL

(CATV, LAN FTTx).

ADSL

ADSL

ADSL

ADSL

(CATV, LAN FTTx).

.2.

2.1.

. 5 . 4, . 1, . 2, „ ” „ “ , . 6 - ,

³² . 135
186/21.04.2015 .:

Eurobarometer,

2013 .,

(78%)

(46%).

()

(2009-2013)

2.2.

VII, . 2
186/21.04.2015 .,

.3.

ADSL

2020”.

33

34

33

34

.3,

. 35-36

186/21.04.2015

ADSL

2013 .

35

44

CATV

3 .

CATV

3

769/12.12.2014 .,

NGA

2013 .,
 2013 . % ()
 NGA , 62- , ” % ()
 ”).

CATV
 3 ,
 . 1.2.2. V (. 181) ,
 186 21.04.2015 .
 DOCSIS ,
 CATV
 - , DOCSIS,
 2013 . 7
 DOCSIS 3.0,

0,5%
 (ADSL, FTTx, LAN CATV).
 2013 . -
 293³⁸ , 36
 CATV ,
 , - ,
 CATV ,
 2013 . , 3%
 ,

3 ,
 3 .

.1.

NGA

3

()

()

3 .

.2.

FT / F

(. V . 157, . 2).

(. 4.1.1, 4.1.2 4.1.3)

55%

(FTTx).

FT

31.12.2013

26,

55%

46%

xDSL

41

⁴⁰ . 198,
⁴¹ . 160

186/21.04.2015

186/21.04.2015

-Digital Agenda for Europe.

xDSL.

DSL

a

(

)

. VI.4.1.

42

ADSL F

, 29

24

43

2015 .⁴⁴

FT /F

⁴² [https://www.esmis.government.bg/page.php?c=85&d=619C:](https://www.esmis.government.bg/page.php?c=85&d=619C)

⁴³ <https://www.esmis.government.bg/page.php?c=85&d=558>

⁴⁴ <https://www.esmis.government.bg/page.php?c=85&d=762>

27⁴⁵,

. V.2.2.2.

(32.7%)

40.4% 43.6%.

. .1

⁴⁵ . 246

ADSL

15 Mbps,

30 Mbps, - 46

55%

. 198

186/21.04.2015

xDSL

xDSL

FTTx

.3.

⁴⁶ <https://www.vivacom.bg/bg/residential/ceni-i-uslugi/internet/domashen-internet>

. V.1.2.1

186/21.04.2015 .,

FTTH/FTTB,

(backhaul)

(

),

.175

. 167, . 7

2.1.

.1 .2 . 157

. 166

-

“ () ”
600 ;
2013 . 63
84 . ;
; ;
LAN
77%—
166

ante

;

- ”

2014/61/

15 2014

01 2016 .” ’

, :

-

- . .1;

-

- . .1;

-

, - . .1;

-

2014/61/ - . .2.

2.3.

”

”.

. .1.

2.4.

•

600

•

•

32

40.

25.

40.

20

2.5.

ex ante

ante

ante

. 8, - . 5, ,

, ,

:

-

-

.

,

,

.

,

,

-

() ,

,

.

769/12.12.2014 . 186/21.04.2015 .,

,

.

. 2.4. IV (. 157) ,

ex ante

- ”

2014 .,

) ”. 10 (

”

,

,

”

(3).

3

- .

,

,

48 ,

⁴⁸ „...some wholesale inputs affect several downstream markets (e.g. broadband access can give operators access to several retail markets other than internet services, such as, for example, voice, broadcasting and SMS).

IPTV

”
ante

ex

195/14.03.2013

49 V, . 2. .23

186/21.04.2015 ., ()

— .

2.6.

ex ante

Therefore, the regulation of wholesale inputs may continue to be necessary even when one of the related retail markets appears to be effectively competitive”, . 15

⁴⁹ ”, . 31 ,

2020.

(VULA)

II, .1.1

186/21.04.2015 .

2014 .

3

4

2007 .)

. 4.2.2.1

3 ,

V, .1.2.1

186/21.04.2015 .

(FTTH/FTTB) .

V, .1.2.1

186/21.04.2015 .

(3

3 ,

, ,
FTTH PON FTTB,
FTTH- WDM).

”
”

”

”

(FTTH)
(FTTH, FTTB, FTTC/xDSL)”.

186/21.04.2015 .

3

(FTTB/FTTH),

(FTTC),
III, . .1.1.2.1

186/21.04.2015 .

3

.2,

. .1, .2, .1.2.5.

.2.

. 1.4.1.

?

?

"

600

. 157

. 1.4.

. 1.4.1.

3 ,

()

. 1.4.1.

3 ,

.3.

3

50

.4.

2013 .

()

(. . .

VI, . 5.4. .1., . 5.4.3.2. . 5.4.3.3.
 , . 5.4.3

⁵⁰ <https://www.vivacom.bg/bg/files/1619-tipovo-predlojenie-za-skluchvane-na-dogovor-za-predostavjane-na-neobvyrzan-dostyp-do-abonatna-linija.pdf>

VI

VI, . 5.4.3.

2013 .

.5.

2013 .

. 36, . 4

5.3. „

(EoI) - VI, .

.6.

1.

. 1.1.

.7.

195/2013 . 6.1.7.

(. 59-61 195/2013 . 195/2013 .).

1361/2012 . 1882/2012

1361/2012 . 1882/2012

1361/2012 . 1882/2012

4, .2, .1 .5 .

.157 .

1361/2012 . . 6.1.7.

195/2013 .

. IX.5.1. . X.5.1.

1882/2012 .

1361/2012 . .

(. 18).

.4 .5 . , ,

.8. ()

1.

246/22.02.2011 . V. . 1.4.3. 1.4.4.

. V. . 1.4.3. 1.4.4. 246/22.02.2011 ,
. 40 . 153 ,

1882/23.08.2012 .
4.4.3. -

2.

246/22.02.2011 .

. V. . 1.4.3. V. . 1.4.4.

3.

246/22.02.2011 .

. V. . 4.1.3

„4.1.3.

246/22.02.2011 .

.4.1.3

246/22.02.2011 .

246/22.02.2011 .

186/21.04.2015 .

V.4.3.3.

.282, .1

1603/12.07. 2012 .

9 .

.167, .

.9.

1.

2013 .

(. 3.5.)

2013 .

VI, .5.4.3.

2.

1603/12.07.2012 .,

. 167, . 3

(),

.10.

1.

. IV.3.5.

VI, . 5.3. „
186/21.04.2015 .

(EoI) –

E ,

2.

.11.

1.

1603/12.07.2012 .,

.167, .3

2013/466/ .

2.

N tz

3 3 .
/

()

1603/12.07.2012 .

.12.

1.

40
2014
15-20
10.03%,
W 10.2% 2014
- 25
18-20
25
15
V
V
25
40/23.01.2014

2.

2014/61/

40

40



), 2011 . 2014 . 2014 (30% .
Analysis Mason (International benchmark of fixed access services)

2014/61/ ,
40/23.01.2014 .,
10%.
— 8.8% 24%,
1603/2012 .
246/2011 .
(3%).

3.

246/2011 .
() ,

. 3 :

.1. ,

, F ,
3 , 3 /

• F

/ , -
,

•

backhaul

;

•

FTTx

, ;

F

3

F

3 3

3

3

. 31, . 5

ante

3

246/22.02.2011 .

F

52/20.01.2015 .

506 23.06.2014 .

52/20.01.2015 .,

ex ante

ex ante

()

BG/2015/1766 (

) BG/2015/1767 ()
BG/2015/1766 (VULA),
VULA
VULA VULA,
VULA,
2013 .
VULA,
25
40
BG/2015/1766
(VULA),
2016 .

IV.

2014 .
 ()
 (4) 2007/879/
 (5) 2007/879/ .
 :
 • (3),
 ()
 (4) 2007 .,
 51,
 ;
 • (3b),
 (,
 5) 2007 .

52

– VoIP, IPTV.

2013 . 33 IPTV
 IPTV () 144 .
 31.12.2013 ., 2 , IPTV
 IP 53 .
 IP , – .
 IPTV, 37 94% 2010 .
 IP 95%

51

2014 .

52

144 Kbps,

http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?action=display&doc_id=5938

53

- 5 2013 . IPTV
36%

ADSL⁶⁰

2013 .

1.2.1.

- -
 -
- 144 Kbps.

(always-on connection);

() -

1,

DSL, FTTx, CATV LAN.

, RLAN,

BWA/FWA, UMTS LTE.

xDSL

(ISDN/PSTN)

xDSL

(ADSL, VDSL, HDSL SDSL),

ADSL
246/22.02.2011 .

04-241/09.12.2013 .

ISDN/PSTN.

04-

VDSL

2013 .

ADSL

...

2009 . (...

31.12.2009 . -

ADSL

a

FTTC/FTTN

61

246/22.02.2011 .,

⁶⁰ Asymmetric Digital Subscriber Line

⁶¹ . 04-04-251/15.11.2013 .

Ethernet xDSL UTP/FTP
 Ethernet xDSL Ethernet
 UTP/FTP Ethernet FTTB
 FTTH FTTB
 ().
 FTTH 66% FTTB
 LAN
 FTTB WDM
 PON. FTTB
 2013 . 131 FTTB 280
FTTC/FTTN
 (FTTC/FTTN)
 Ethernet xDSL UTP/FTP
 FTTC/FTTN Ethernet
 UTP/FTP Ethernet
 2013 . 157 FTTC/FTTN
 542
 • **CATV**
 (CATV (HFC)), / -
 DOCSIS⁶⁵, -
 DOCSIS 3.0 ,

⁶⁵ Data Over Cable System Interface Specification

DOCSIS 3.0
150 Mbps.

CATV

DOCSIS 3.0
DOCSIS 3.0
173
CATV

- LAN

(LAN),

UTP/FTP

Ethernet

FTTB FTTC/FTTN
2009

LAN

LAN

FTTx

LAN

UTP/FTP

LAN
Ethernet

, LAN

LAN

(UTP/FTP).

LAN

2013 . 328
820

LAN

2007 .)

4 5 (
(Dedicated Access)

31.12.2013 . 26

MAN⁶⁶

Ethernet

(SLA),

24-

• **RLAN**

RLAN⁶⁷

WLAN⁶⁸

IEEE 802.11

2,4 GHz

5 GHz.

RLAN

Wi-Fi

RLAN

(Wi-Fi).

Wi-Fi

(-).

Wi-Fi

(Wi-Fi

Access Point)

(

IEEE 802.11).

IEEE 802.11b, 802.11g 802.11n,
11 Mbps, 54 Mbps

⁶⁶ Metropolitan Area Network

⁶⁷ Radio Local Area Network

⁶⁸ Wireless Local Area Network

600 Mbps.

Point)

(Wi-Fi Access

RLAN

1084

2013 . 176

(FWA)

(BWA)/

(FWA)

WiMAX-

(BWA)/

WiMAX⁶⁹
IEEE 802.16

MAN
WiMAX

IEEE 802.16
802.16-2004

3G
WiMAX

WiMAX

802.16
4G WiMAX 2.0

Mbps),

70 Mbps

WiMAX

Wi-Fi

WiMAX

, IPTV

2009 .

WiMAX

2013

WiMAX

⁶⁹ Worldwide Interoperability for Microwave Access

- **(UMTS/HSPA+)**
 UMTS⁷⁰ (3G). UMTS
 , 384 Kbps.
 HSPA⁷¹ HSPA+⁷²
 - HSPA, 21 Mbps (
), HSPA+
 42,2 Mbps (),
 ,
 .
 ” ”) (, ” ”
 ” ” ” , 3G .
 04.11.2014 . ”
 ” ” ” ”

- **(LTE)**
 LTE
 (4G),
 , (3G). LTE
) - (-
) -
 LTE.
 ” ” ⁷³, 2014 .
 ,
 . ” ”
 ,
 LTE.

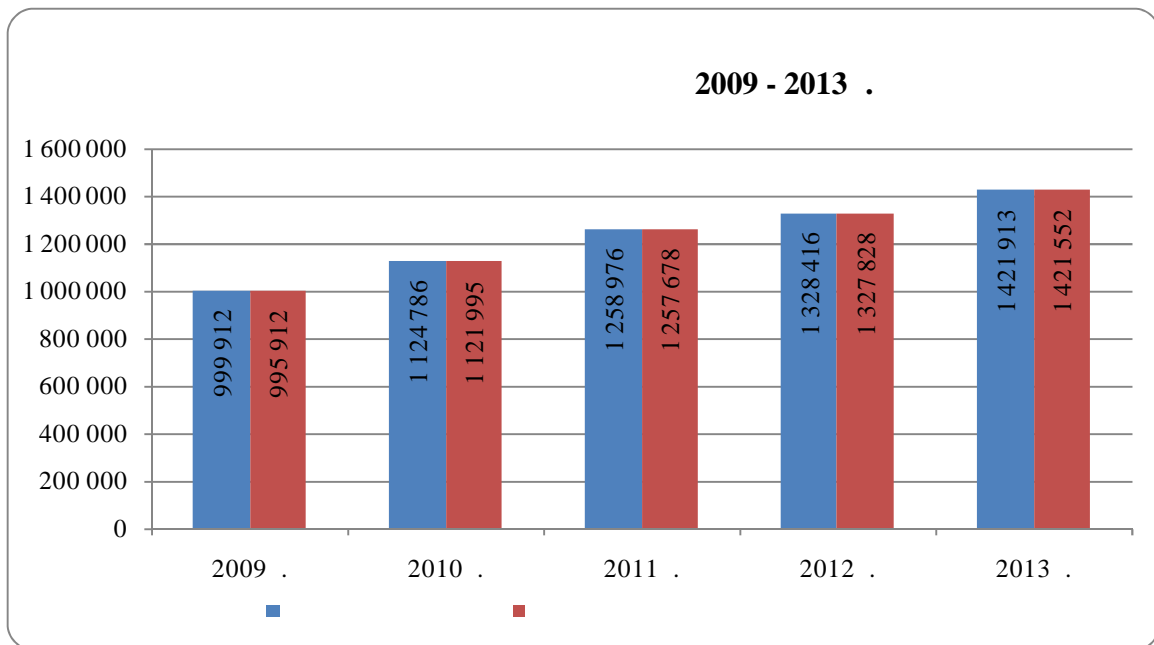
- VSAT , ,

⁷⁰ Universal Mobile Telecommunications System
⁷¹ High Speed Packet Access
⁷² Evolved High-Speed Packet Access
⁷³ <http://www.maxtelecom.bg/en>

2013 . ()
 Surfbeam 2⁷⁴ ... (ViaSat Inc. „TooWay”⁷⁵ ,

1.3.

2009–2013 .
⁷⁶ , (,
), - , 31.12.2013 . 1 421 913⁷⁷ (1),
 26,4% – 2010 . 40%
 2009 .



: , **1**

, ,
 , 2013 . 99,97%.
 - (. 144 Kbps).

⁷⁴ <http://www.vivacom.bg/web/files/richeditor/terms/obshti-uslovija-za-predostavjane-na-uslugata-vivacom-tooway-v-sila-ot-30-11-2012-g-483-bg-BG.pdf>

⁷⁵ <http://www.vivacom.bg/bg/business/ceni-i-uslugi/internet/sateliten-internet/tooway>

⁷⁶ ,
⁷⁷ 92,3% .

2013 . 3639 2430 , 361

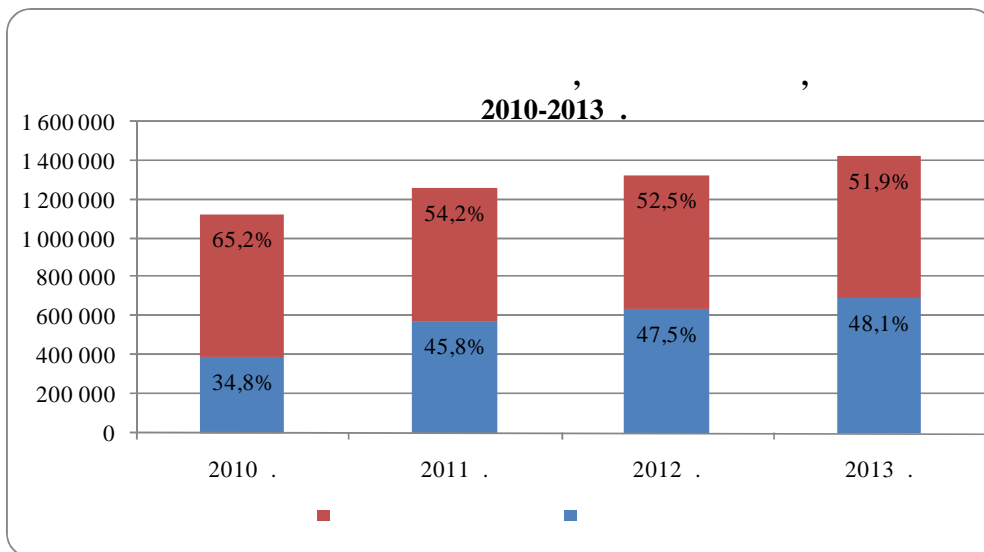
2012 . - 5,5% . 2011 . 12%,
2013 . 7%

2013 . 40,6 78 (. BWA),
2010 . - ,

2010 . 34,7% 7,6 . 2011 .
3,6 - ,

2010 - 2013 . 75%,

(. 2).



: ,

2

2013 .

13,3

31.12.2013 .

34,2%

2012

3).

DSL⁷⁹,

18%⁸⁰ (.

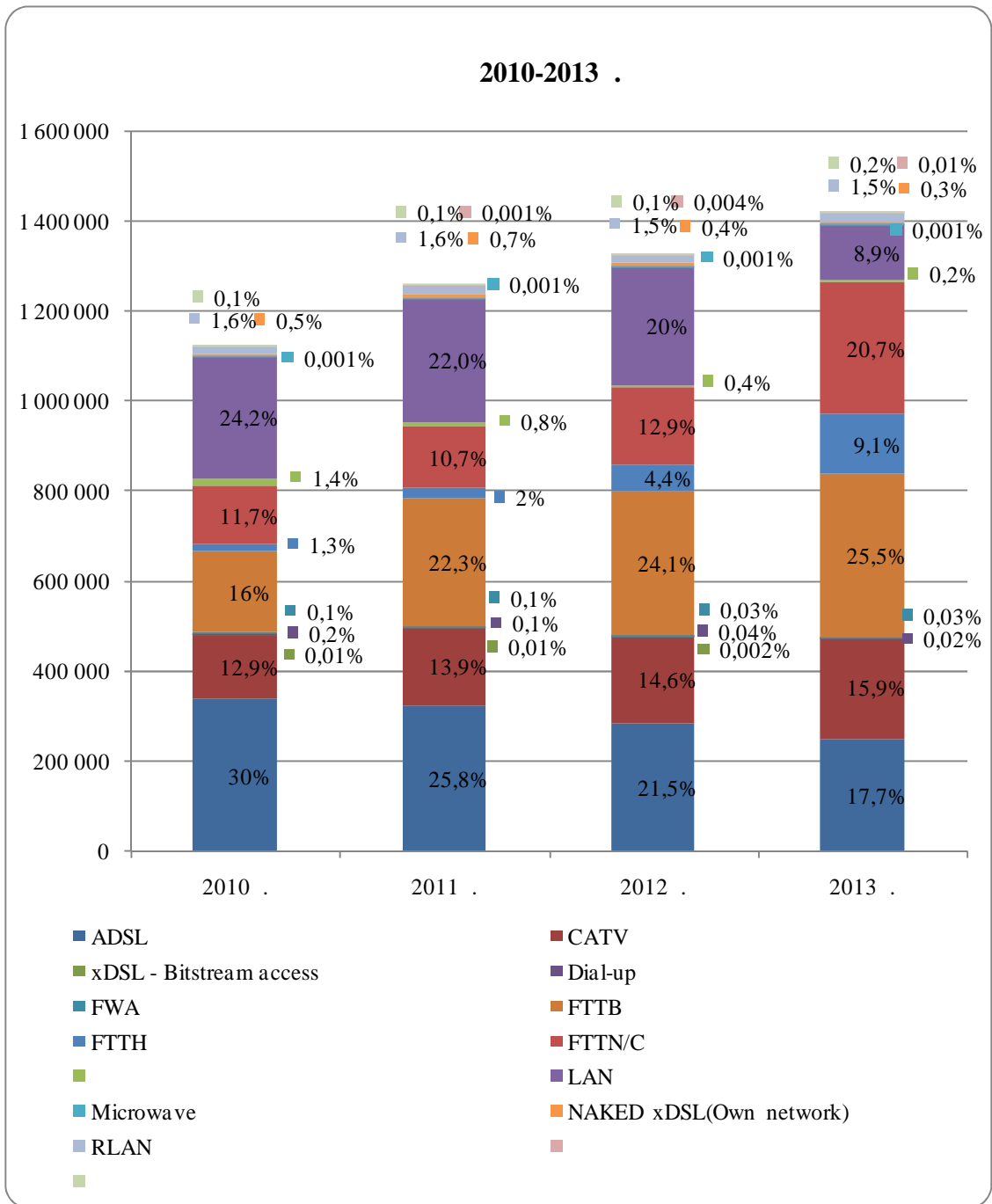
⁷⁹

DSL

2014 . e 72% (Digital Agenda

Indicators 2013)

⁸⁰ Digital Agenda Indicators 2013



3

31.12.2013 .

(82%),

ADSL

ADSL

2009 .,

69%.

FTTB (25,5%),

2010 - 2013 .

100%.

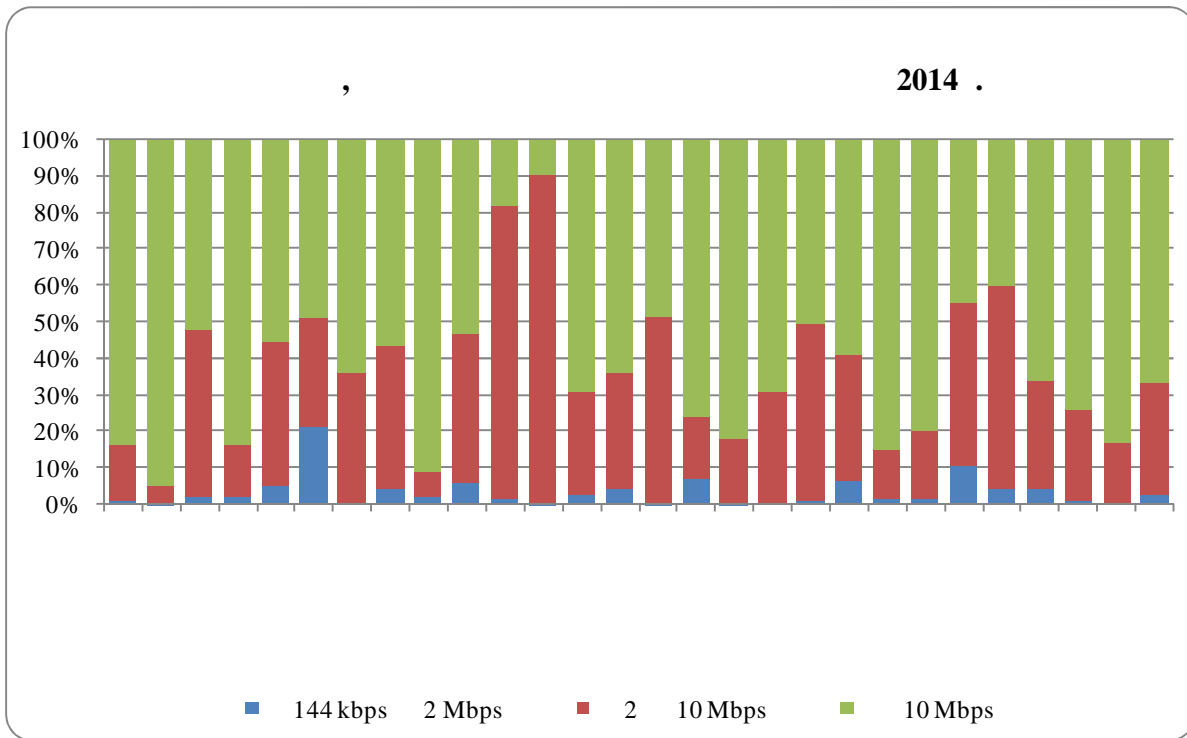
(FTTx)

2,4

2013 .

55%

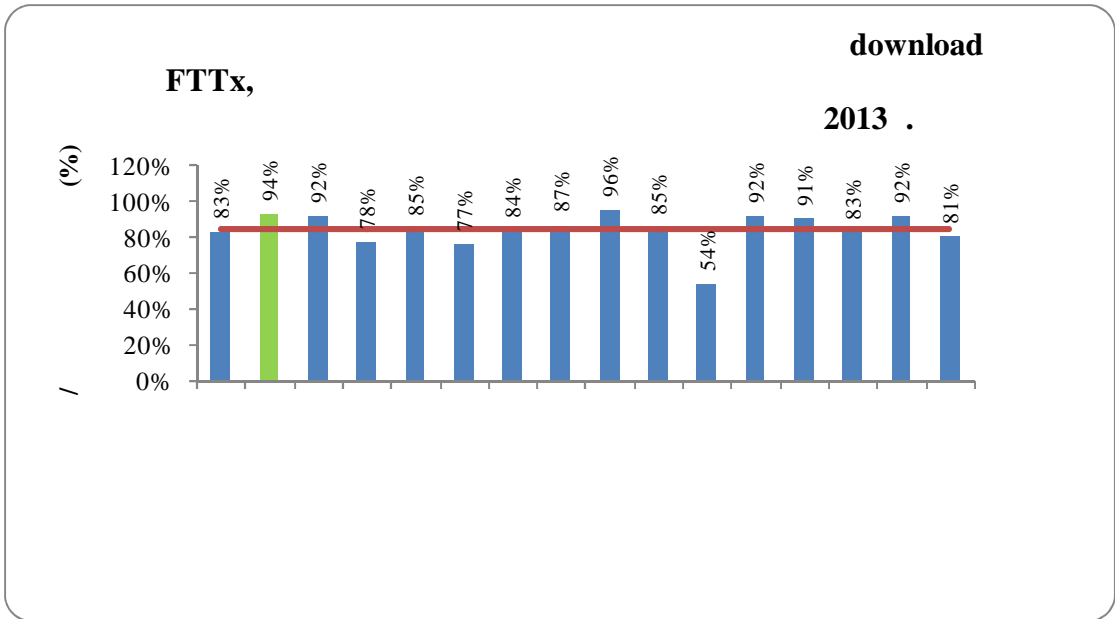
31.12.2013 . 10 Mbps 94%, 34
 2009 . 2 Mbps 0,15% 31.12.2009 . 5% .
 2014 . 5.



: Digital Agenda Scoreboard 2014 - Broadband markets

5

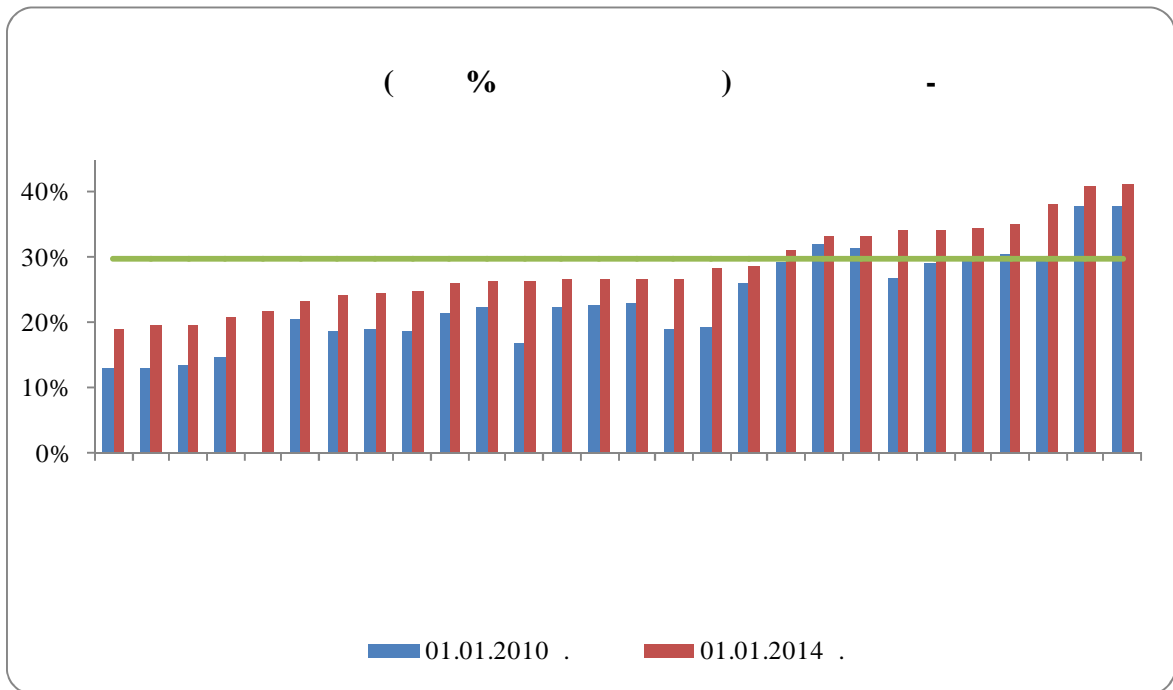
10 Mbps 29 . . - ,
 , SamKnows Limited
 xDSL, FTTx (CaTV).
 FTTx ,
 16 - 93,5% ,
 (95,6%), 84,6%
 (. 6).



: Quality of Broadband Services in the EU – October 2013⁸²

6

01.01.2014 .

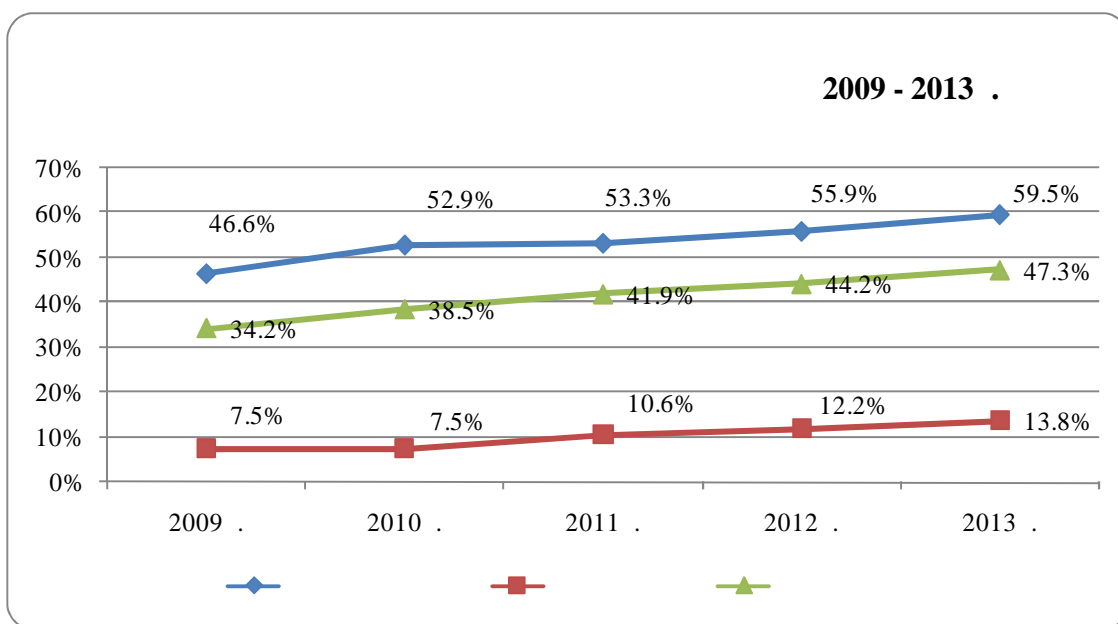


: Digital Agenda Scoreboard 2014

7

⁸² <http://ec.europa.eu/digital-agenda/en/news/quality-broadband-services-eu-samknows-study-internet-speeds-second-report>

01.01.2014 . 19,5%⁸³ 6,5
 01.01.2010 ., 2010 - 2013 .
 - 1,6 ,
 , 84 2014 . (29,8%).
 , 30 Mbps
 - (6,3%), 8,3%,
 24%. (150%)
 100 Mbps, 01.01.2014 . 85 2014 . 62%
 , NGA .
 27%.
 2013 .
 59,5% 13,8% (8).



: , 2011 ., 2009 - 2010 . - 2011 - 2013 ., 2001 .
 :

⁸³ Digital Agenda Scoreboard 2014

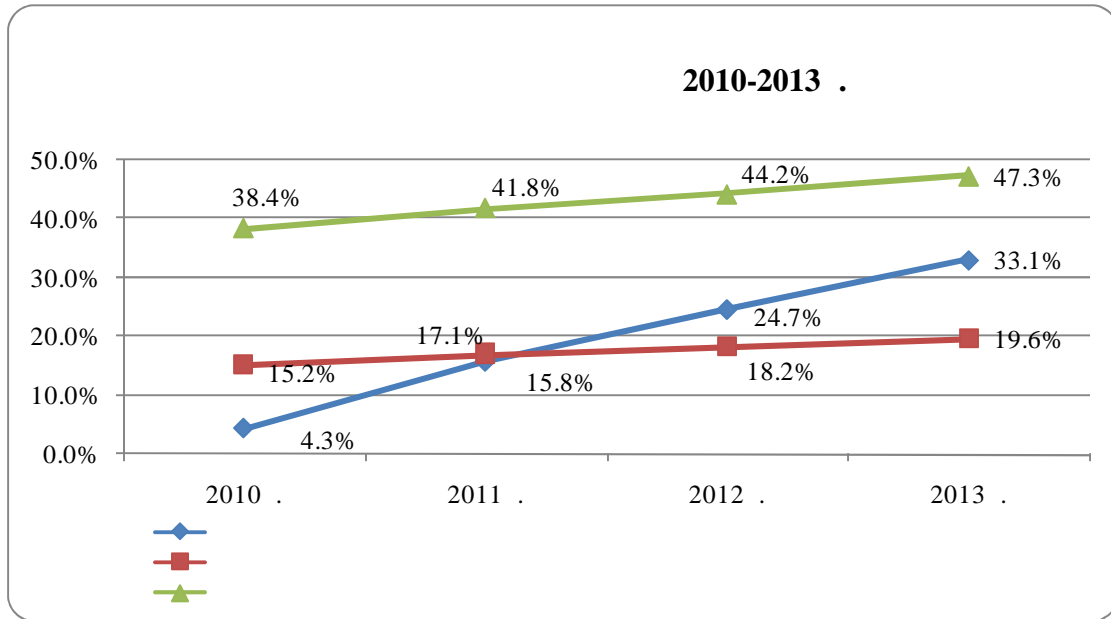
⁸⁴ Implementation of the EU regulatory framework for electronic communications – 2014.

⁸⁵ Implementation of the EU regulatory framework for electronic communications – 2014

2013 . 7,8% (, 2010 . 6,22%).

86

2010 - 2013 .



: ,

9

30 4,3% 2010 . 33,1% 2013 .,

87

1300

2013 ., 2013 ., 40,4%, 31,7% , 2009 .⁸⁸,

86

BWA.

87

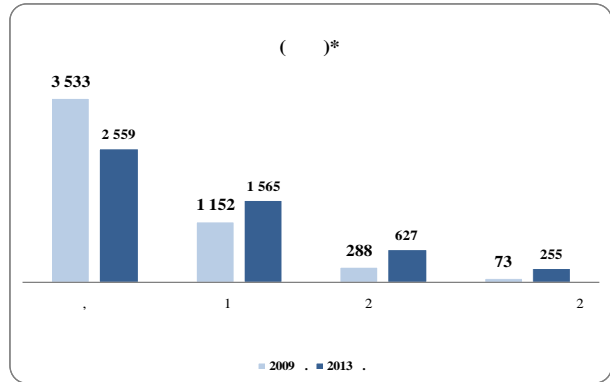
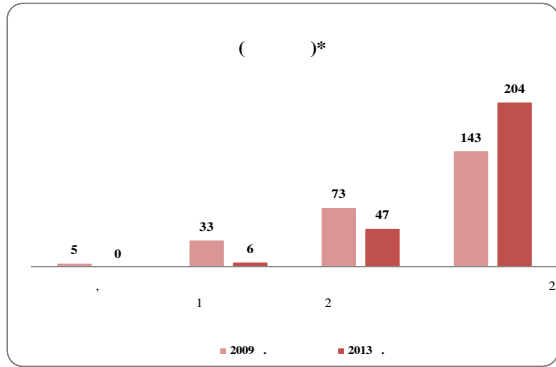
88

2010 .

2014

37,6%.

89,



* : 254 . 2009 . 257 . 2013 . (

* : 5 046 . 2009 . 5006 . 2013 . (

(())

(())

:

:

10

10

2013 .

(2009 .). 31.12.2013 .

43%,

1

6. 49%

62%

2009 . (

30%

).

12% ,, ”

1

(1565), 26%

2

2009 .

90,

2013 .

89

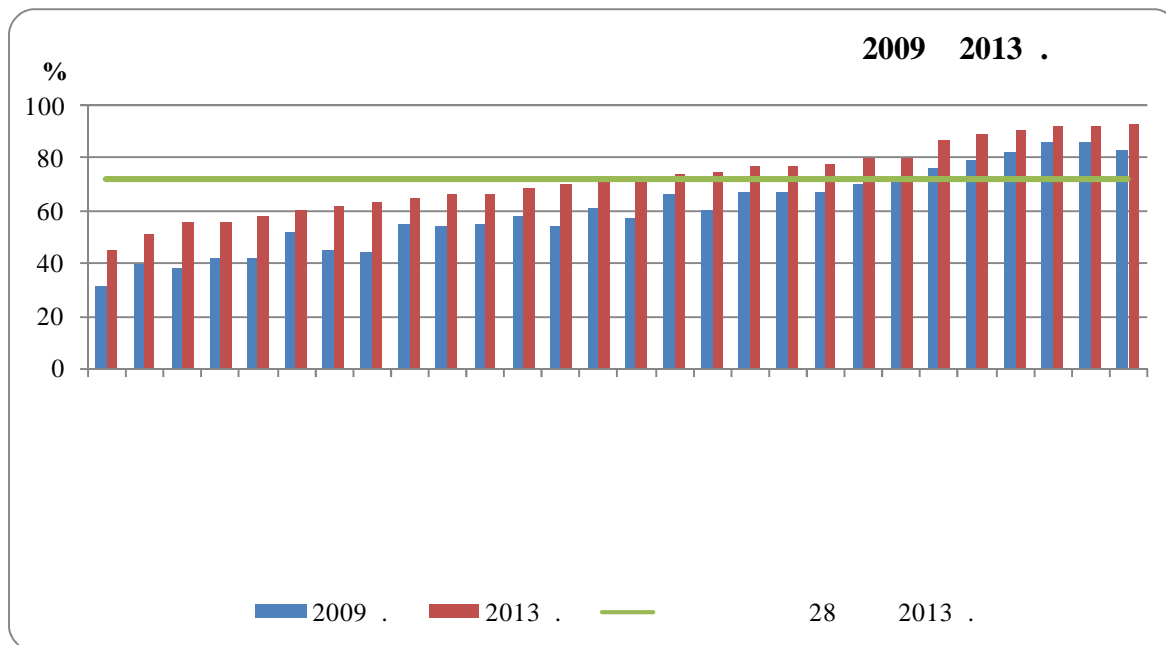
2014, .34

⁹⁰ <http://www.nsi.bg/bg/content/2814/%D0%BB%D0%B8%D1%86%D0%B0-%D1%80%D0%B5%D0%B3%D1%83%D0%BB%D1%8F%D1%80%D0%BD%D0%BE-%D0%B8%D0%B7%D0%BF%D0%BE%D0%BB%D0%B7%D0%B2%D0%B0%D1%89%D0%B8-%D0%B8%D0%BD%D1%82%D0%B5%D1%80%D0%BD%D0%B5%D1%82>

), 51,2%,
2009 - 2013 .

(
11

(. 11),



: , ()
: Eurostat⁹¹

11

1.4.

,
2013 .
286 . . , 8%
10%
(45%) 2013 .
2009 . 16%
2009 .
- 130 . .

⁹¹ http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

⁹² 92,7%

2.1.

. 4.2.1
2014 . . 44

2014 .

95

2014 .

(QoS),

(Contention Ratio)

2.1.1.

(ADSL), (CaTV), LAN, BWA/FWA, UMTS, (FTTH, FTTB, FTTC/FTTN), (RLAN,).
 2
 31.12.2013 . ()
)

2

ADSL			!
CATV	213 014	12 823	225 837
FTTB	337 605	24 584	362 189
FTTH	111 834	17 864	129 698
FTTN/C	269 436	24 433	293 869
LAN	114 709	11 338	126 047
	0	3 245	3 245
*	!!!	!!!	2367584
			!
RLAN	17 567	3 488	21 055
FWA			!
BWA			
Microwave			
	1 270 228	151 349	3 819 931

*

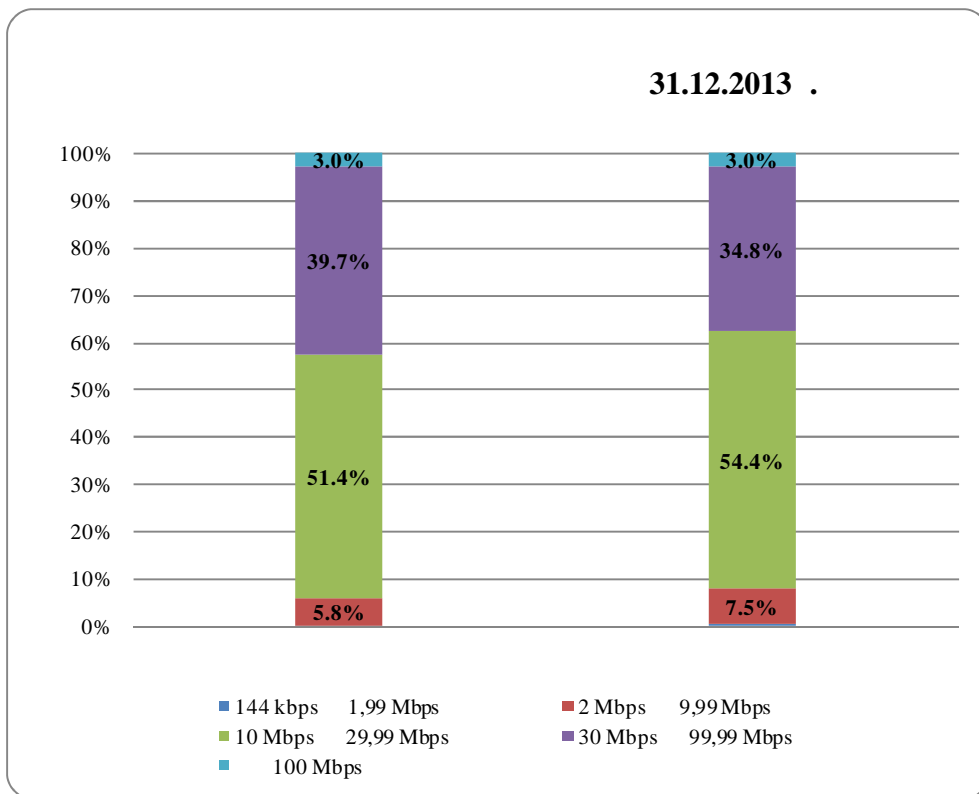
,
 :
 BWA.
 , 89,4%
 96
 -
 :
 (- 79,98% ADSL
 - 94,32% CATV).

96

” ”) (

Microwave.

31.12.2013 .



12 , 90%
10 Mbps,

12

Support).
(Uncontended Capacity)

(SLA)

(Help Desk

(Dedicated Access)

3

144 kbps 1,99 Mbps	8,36%	0,11%
2 Mbps 9,99 Mbps	39,34%	5,87%
10 Mbps 29,99 Mbps	32,19%	51,80%
30 Mbps 99,99 Mbps	16,06%	39,23%
100 Mbps	4,05%	2,99%

	VIVACOM Net 20	20 Mbit/s	1 Mbit/s	17,8	0/18**	» 5 MB WEB » 500 B) » » » » » » POP3/IMAP/SMTP/Web (	ESET NOD32 6 ISP Edition
	FiberNet 50	50 Mbit/s	25 Mbit/s	23,8	0	» 5 MB WEB » 1 IP » » » ESET NOD32 6 ISP Edition	
	FiberNet 100	100 Mbit/s	50 Mbit/s	39,8	0	» 5 MB WEB » 1 IP » » » ESET NOD32 6 ISP Edition	
	VIVACOM Net BIZ 20	20 Mbit/s	2 Mbit/s	25,8	0/18**	» 5 GB WEB » 30 . » 500 B) » » POP3/IMAP/SMTP/Web (	ESET NOD32 ISP Edition - 3 IP
	FiberNet Biz 50	50 Mbit/s	50 Mbit/s	41,76	0	» 5 GB WEB » 30 . » » ESET NOD32 ISP Edition - 3	IP
	FiberNet Biz 100	100 Mbit/s	100 Mbit/s	59,76	0	» 5 GB WEB » 30 . » » ESET NOD32 ISP Edition - 3	IP
"	50 Mbps	50 Mbit/s	7 Mbit/s	22,9	0	» IP - 2	
	100 Mbps	100 Mbit/s	10 Mbit/s	39,9	0	» IP - 5	
	50 Mbps	50 Mbit/s	25 Mbit/s	41,88	0	» Exchange 2010), » 3 » » IP - 3	1 GB (Microsoft POP3 IMAP4
	100 Mbps	100 Mbit/s	50 Mbit/s	65,88	0	» Exchange 2010), » 3 » » IP - 5	1 GB (Microsoft POP3 IMAP4

*

**

0,00

18,00

99

31.12.2013

(/)

2013

2000

50 Mbps,

195

4,

24

42

⁹⁹ <http://www.vivacom.bg/bg/residential/ceni-i-uslugi/internet/domashen-internet/fiber-net-50#tab-dopylnitelna-informacija>

2.1.2.

31.12.2013 . 589 ,
, 106
2013 .
1,89%.
24 .

()

,

(Help desk-),

. 1.2.1 IV,
(Ethernet)

()

()

2.2.

(. 1.2.1. IV),

2.2.1.

144 Kbps.

4 IV, . 1.3.

(always-on connection);

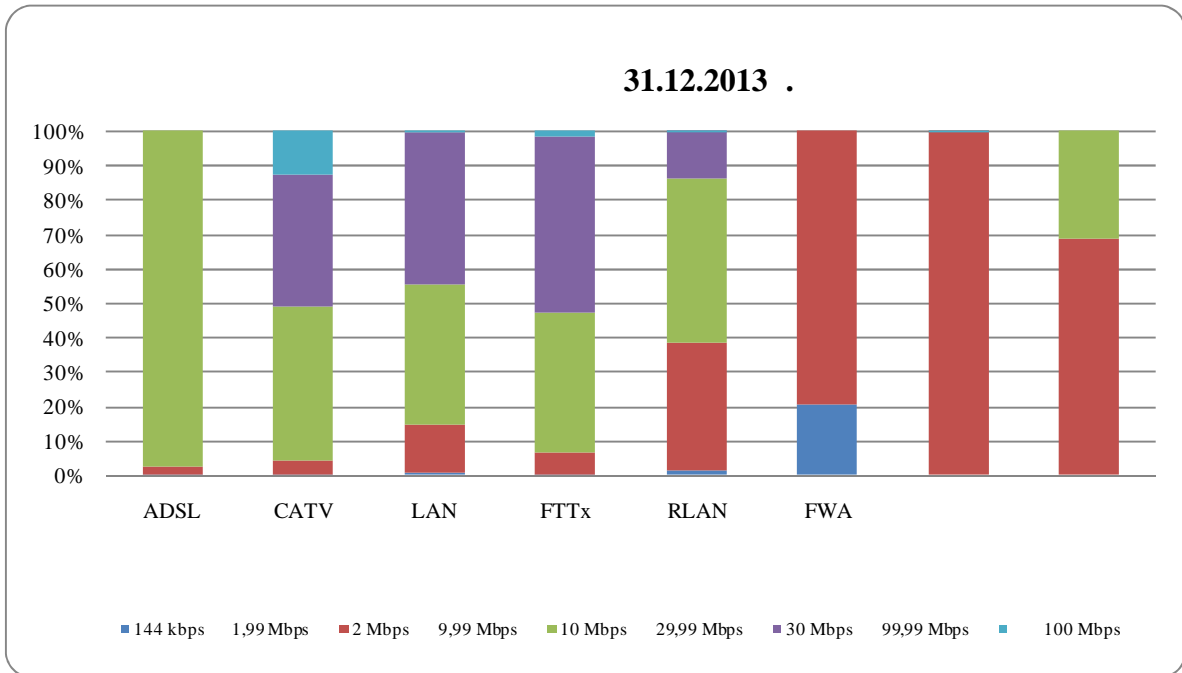
() -

, 94%

2013 .

10 Mbps. 90%
10 Mbps,

(. 13).



:

13

13, -

Mbps” ,, 30 Mbps 99,99 Mbps”, ,, 10 Mbps 29,99

- FTTx, CATV LAN.

ADSL

12 Mbps 2009 . 20 Mbps

30 Mbps ADSL

VDSL

13 - ,

(RLAN,

FWA

), 40%

RLAN, 68%

80%

FWA

2 9,99 Mbps, 32% 48%

RLAN

10

29,99 Mbps.

(ADSL, FTTx, CATV LAN)

(

(LTE),
2014 .,

LTE

(ADSL, LAN)

100

100

. 2.1. -

90%,

IP

64,80

ADSL

NGA

ADSL

NGA

LAN

LAN

(45% LAN

LAN

30 Mbps),

5

		Mbps	
" "	BASIC	45	16
	STANDART	90	20
	PREMIUM	96	26
" - "		10	15
		20	18
		40	23
		60	26
" "	30 Mbps	30	18,9
	50 Mbps	50	22,9
	100 Mbps	100	39,9

2014

LAN

ADSL

606

2013 . 50%
1%

LAN,

5

(CaTV)

ADSL LAN

–”
32,99 .¹⁰⁶
25, 50, 100 150 Mbps
12-

18,99 ., 22,99 ., 27,99
19,99 . 31,99 .

31.12.2013 .

FTTx
¹⁰⁷

(FTTH, FTTB FTTN/FTTC),

106

<http://blizoo.bg/index.html>

107

2014 .

2013 .

		Mbps	
" "	30 Mbps	30	18,9
	50 Mbps	50	22,9
	100 Mbps	100	39,9
" "	1	15	13
	2	25	14
	3	50	15
	4	100	19
	FiberNet 15	15	16,8
	FiberNet 20	20	17,8
	FiberNet 30	30	19,8
	FiberNet 50	50	23,8
	FiberNet 100	100	39,8

LAN CaTV

ADSL,

RLAN

2013 .

RLAN

200 .

(FWA)

(BWA)/

109 .

(BWA/FWA),

108

110

FWA
1024 Kbps, 37,90 .

29,90 .

2048 Kbps,
30 .

108

109

110

(FWA)
(BWA).

2013 .

BWA a,

2014

21,90 39,90 /

111

16 Mbps 2 Mbps.

40 300 GB

256 Kbps

128 Kbps

WiMAX

(UMTS/HSPA+/LTE)

112

7

" "	" "	MB	()	MB	()	MB
S		150 MB	-	9,90 .	0,066	64 kbps
M		512 MB	-	15,90 .	0,031	64 kbps
L		1024 MB	-	19,90 .	0,019	64 kbps
POWER SURF		-	0,02	9,90 .	-	-
S		512 MB	-	5,90 .	0,012	64 kbps
M		1024 MB	-	9,90 .	0,010	64 kbps
2,5 GB		2560 MB	-	13,90 .	0,005	64 kbps
L		5120 MB	-	24,90 .	0,005	64 kbps
XL		20 480 MB	-	39,90 .	0,002	64 kbps

: 1 KB.

0,01 .

¹¹¹ <http://www.maxtelecom.bg/bg/personal/wi-max/abonamentni-uslugi/wi-max>

¹¹²

2014 .

			MB		MB	MB
GLOBUL GoWeb Unlimited 50		50 MB	–	4,50 .	0,090	128 kbps
GLOBUL GoWeb Unlimited 100		100 MB	–	6,50 .	0,065	128 kbps
GLOBUL GoWeb Unlimited 200		200 MB	–	9,50 .	0,048	128 kbps
GLOBUL GoWeb Unlimited 500		500 MB	–	11 .	0,022	128 kbps
GLOBUL GoWeb Unlimited 1000		1000 MB	–	12,50 .	0,013	128 kbps
GLOBUL GoWeb Basic 100		100 MB	–	2,90 .	0,029	128 kbps
GLOBUL GoWeb Start 500		500 MB	–	5,90 .	0,012	128 kbps
GLOBUL GoWeb Unlimited 1000		1000 MB	–	9,90 .	0,010	128 kbps
GLOBUL GoWeb Unlimited 2500		2500 MB	–	13,90 .	0,006	128 kbps
GLOBUL GoWeb Unlimited 5000		5000 MB	–	24,90 .	0,005	128 kbps
GLOBUL GoWeb Unlimited 10000		10000 MB	–	34,90 .	0,003	128 kbps

: , , 1 KB, , 1 KB.
– 5 KB,

			MB		MB	MB
Data S		60 MB	–	5,80 .	0,097	64 kbps
Data M		300 MB	–	9,80 .	0,033	64 kbps
Data L		1500 MB	–	15,80 .	0,011	128 kbps
Traffic Unlimited S+		1000 MB	–	9,80 .	0,010	64 kbps
Traffic Unlimited M+		3000 MB	–	15,80 .	0,005	128 kbps
Traffic Unlimited L+		6000 MB	–	27,80 .	0,005	128 kbps
Traffic Unlimited XL+		12000 MB	–	37,80 .	0,003	128 kbps

: 1 KB. 1 KB 1 KB. +Data S
+Data M 7,2 Mbps, +Data L - 42 Mbps.

, MB
10 -
MB
1024 MB, 2560 MB, 5120 MB 10240 MB
2010 . 2014 .

	1024 MB		2560 MB		5120 MB		10240 MB	
	2010 .	2014 .	2010 .	2014 .	2010 .	2014 .	2010 .	2014 .
MB (.)	0,023	0,010	0,010	0,005	0,007	0,005	0,004	0,003
MB (.)	0,10		0,10		0,10		0,10	

2014 . 2010 . 58% 25%.

2014 .

128 Kbps,

64 Kbps

1.2.1. -

2014 . „
LTE

11

11

" "			MB		/
4G LTE Easy 10	10240 MB	21,95 .	256 kbps	0 1049 .	75 Mbps/ 25 Mbps
4G LTE Easy 20	20480 MB	24,95 .	256 kbps	0 1049 .	75 Mbps/ 25 Mbps
4G LTE Easy + 30	30720 MB	36,95 .	256 kbps	0 1049 .	75 Mbps/ 25 Mbps

*

4G

113

Kbps

64

128 Kbps

– 256

31.12.2013 .

() .

39 . 169 .

10 22 Mbps.

WiMAX,

(8 GB - , 100 GB – -) .

web browsing e-mail¹¹⁴.

¹¹³ www.maxtelecom.bg

¹¹⁴

– 10 MB)

2014 ., 699 . , /
300 ./60 . .

2014 .

(31.12.2013 .)

1 Mbps

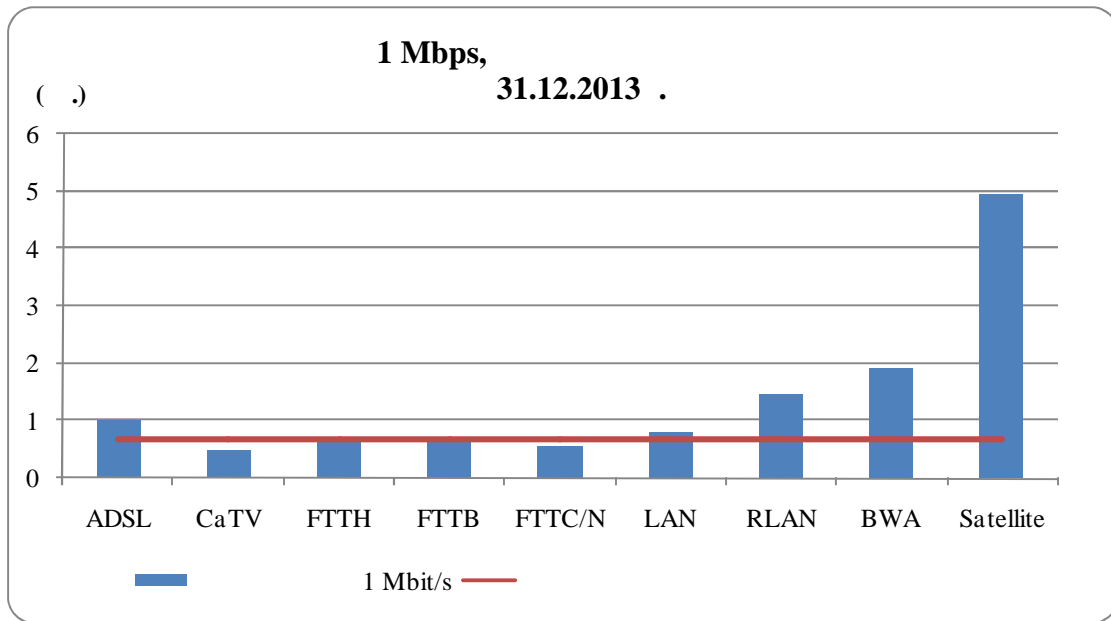
12

	ADSL	CaTV	LAN	FTTx	RLAN	UMTS	Satellite	LTE	BWA
(always-on connection)									
-	*								
Mbps (download/upload)	15/1	25/3	45/N/A	30/5	4/4	42/5,74	10/2	75/25	16/2
Mbps (download/upload)	15/1	25/3	45/N/A	30/20	4/4	42/5,74	10/2	75/25	16/2
) (	0/18 .	9,90 .	0,00 .	0,00 .	20,00 .	N/A	360,00 .	0,00 .	19,90 .
()	16,80 .	18,99 .	16,00 .	18,90 .	12,00 .	5,90 .	39,00 .	21,95 .	21,90 .
()	0,00 .	0,00 .	0,00 .	0,00 .	0,00 .	69,90 .	699,00 .	145/199/219 .	0,00 .
-	*								
Mbps (download/upload)	20/1	150/6	96/N/A	100/10	30/30	42/5,74	22/6	75/25	16/2
Mbps (download/upload)	20/1	150/6	96/N/A	100/40	30/30	42/5,74	22/6	75/25	16/2
) (	0/18 .	9,90 .	0,00 .	0,00 .	0/25 .	0,00 .	360,00 .	0,00 .	0,00 .
()	17,80 .	32,99 .	26	39,90 .	18,00 .	37,80 .	169,00 .	36,95 .	39,90 .
()	0,00 .	0,00 .	0,00 .	0,00 .	0,00 .	0,9/39,90 .	699,00 .	0,00 .	0,00 .

¹¹⁵ <http://www.vivacom.bg/bg/residential/ceni-i-uslugi/internet/sateliten-internet/tooway-internet#tab-oborudvane-i-instalacija>

2013 .¹¹⁶, Eurobarometer,
(46%). (78%)

117,
2013 ., 14 - . (Mbps)¹¹⁸



: FWA 22,07 . 1 Mbps.

:

14

, 1 Mbps

1 Mbps

ADSL, LAN, CaTV, FTTx

¹¹⁶ E-Communications Household Survey – Special Eurobarometer 396, November 2013

¹¹⁷

¹¹⁸

2013 .

(5-10%),
(ADSL, CaTV, LAN FTTx)

10 - ,

2009 . (1 Mbps)

¹¹⁹ (0,50 .) -

(0,69 .).

128 Kbps (.) 64

-

¹²⁰ ,

4 5¹²¹ .

2010 - 2013 .
(LAN, CaTV, ADSL FTTx)
- 7,6 .

30%,

2010-2013 ..

9 ,

¹²² ,

2011-2013 .
¹²³ ,

3,3 , 3,8 ,

0,6% , 2013 .

.) (- ,

119

1 Mbps

120

BWA.

121

2007/879/

17

2007 .

122

BWA.

123

BWA.

3G
 2009-2013 .
 2009 .

13

3G
2009 - 2013 .

	2009 .	2010 .	2011 .	2012 .	2013 .
„ ”	19,41%	55,90%	89,50%	96,60%	97,87%
„ ”	47,02%	60,23%	72,17%	76,51%	80,39%
	16,72%	76,71%	87,00%	95,95%	97,90%

14

3G
2009 - 2013 .

	2009 .	2010 .	2011 .	2012 .	2013 .
„ ”	69,19%	84,87%	97,64%	99,46%	99,73%
„ ”	82,05%	88,96%	92,95%	94,81%	96,09%
	54,32%	93,43%	97,81%	99,41%	99,81%

LTE (4G)

124 .
 2014 ., Eurobarometer¹²⁵,
 20%

¹²⁴ <http://www.mtel.bg/paket-optichen-i-mobilen-internet>

<http://www.vivacom.bg/bg/residential/ceni-i-uslugi/combine/internet>

¹²⁵ E-Communications and Telecom Single Market Household Survey – Special Eurobarometer 414, March 2014

31.12.2013 . - (23,5%).

80% ... ()

31.12.2013 . 7

. 2.2.1

/

2009 ..

. 1.3.,

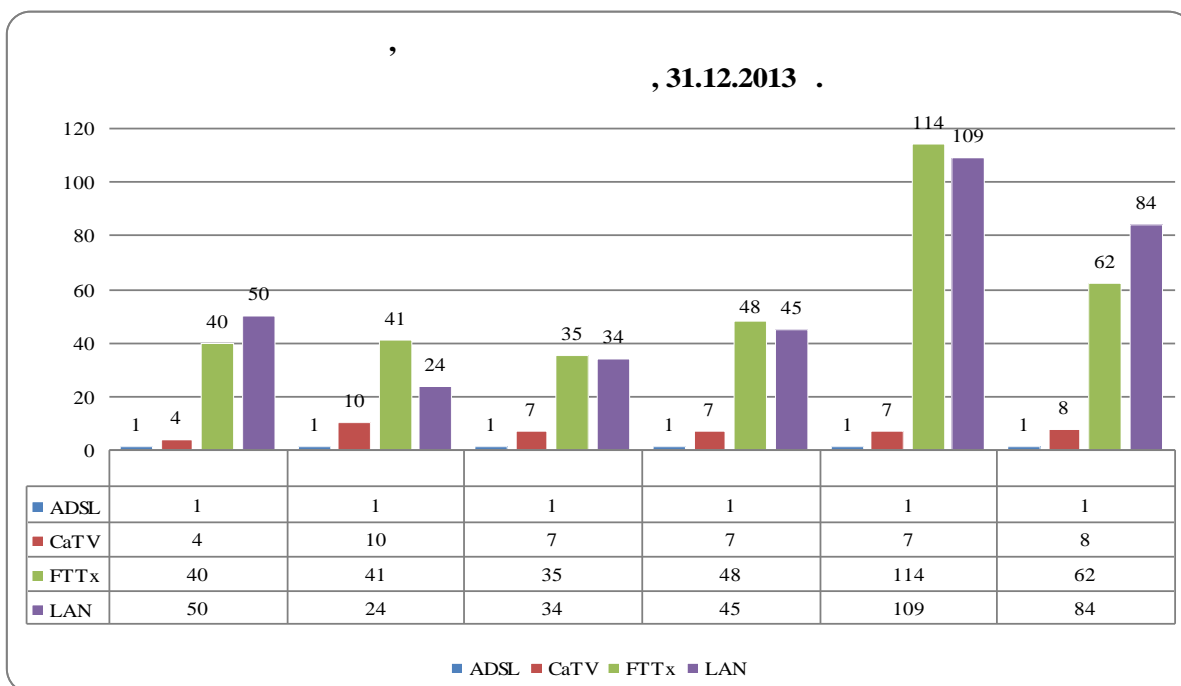
13 . .) (2009 – 2013 .

55% 3 , 2013 . 25% 2009 .

2014 .

61% 39% 2009 . 536
724 1 .

15



15

LAN

(128). (49,4%)

2009 .

LAN

2009 . 20%

¹²⁸ http://www.nsi.bg/sites/default/files/files/pressreleases/Population2013_AUIT2RS.pdf

2013 .

40% ()

(17).

17

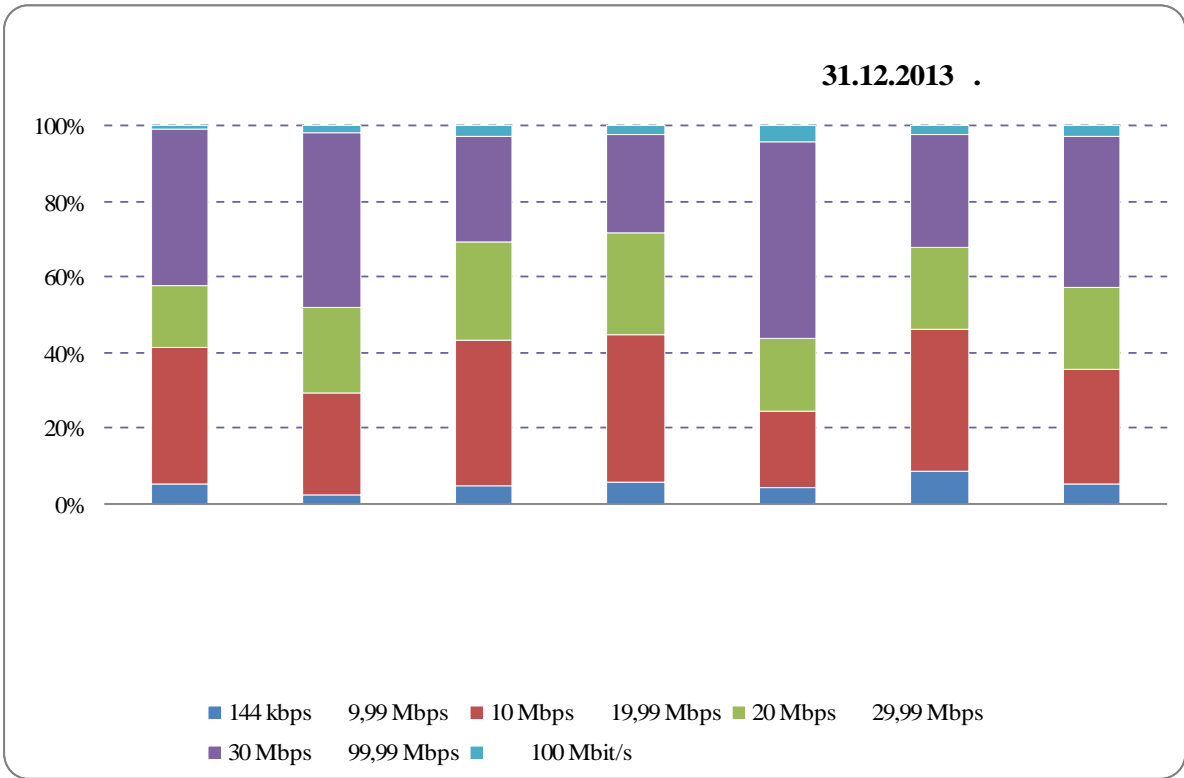
	31.12.2009 .	61	56	67	178	108	70
	31.12.2013 .	81	64	61	183	127	79
	2013 . 2009 .	29	28	25	72	53	33
	2013 . 2009 .	7 774	11 123	34 575	65 221	58 734	30 502
	31.12.2009 .	70 883	102 287	128 374	361 162	169 567	121 803
	31.12.2013 .	106 589	142 227	192 020	512 220	256 132	184 171
FTTH/B/N/C	2013 .	13	15	14	41	20	18
	2013 .	5 872	6 164	32 742	61 172	42 929	28 260

:

38%

2013 . 2009 .

55%



∴ ,

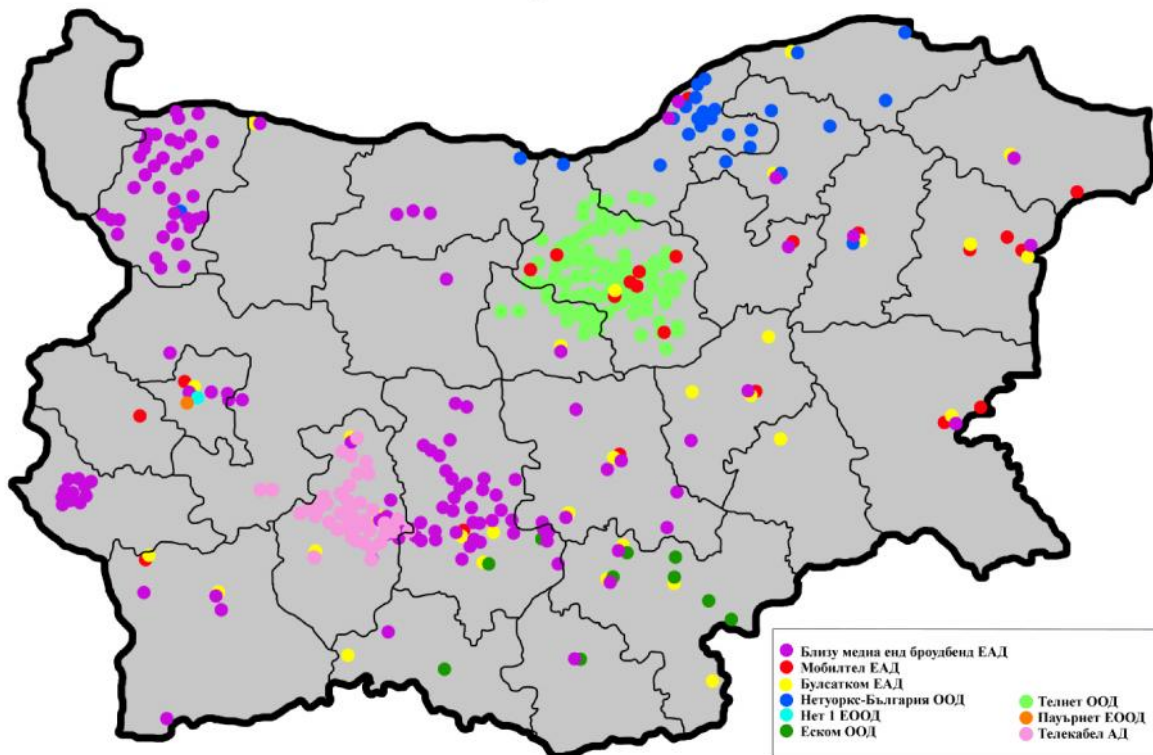
16

16, (92 %)
 10 – 100 Mbps.

1%

1%
 (

Населени места, в които осъществяват дейност конкурентните предприятия с относителен дял по-голям от 1% на база брой абонати към 31.12.2013 г.



17

17

1%

31.12.2013

2013 . 327 – 252 2009 .

– 5

()

	2009 .		2013 .	
	61	70 883	81	106 589
	56	102 287	64	142 227
	67	128 374	61	192 020
	70	121 803	79	184 171
	178	361 162	183	512 220
	108	169 567	127	256 132
	486	954 076	537	1 393 359

: ,
 , 2013 . 2009 . ,
 11% ,
 , 2013 . 2009 .
 20 , 1% ,
 - , 2013 . 20
 2,5 - 32,0% , 2009 . 52,7% 2013 .
 (, 2,6%),
 , 50% ,
 46% .
 , ...% () 2009 .
 ...% () 2013 .
 20 ,
 31.12.2013 .

2009-2013 .					
	2009 .	2010 .	2011 .	2012 .	2013 .
" "	!				
" "					
" - "					
1%	8,2%	12,0%	18,4%	18,3%	18,0%
	57,6%	52,1%	51,5%	53,6%	56,3%
!					
" "	!				
" "					
" - "					
1%	34,9%	32,5%	43,1%	48,0%	49,3%
	28,8%	31,6%	25,3%	25,5%	27,3%
!					
" "	!				
" "					
" "					
1%	14,5%	21,9%	32,1%	35,4%	37,7%
	29,5%	24,6%	23,8%	25,2%	25,8%
!					
" "	!				
" "					
" "					
1%	12,3%	14,5%	26,3%	28,4%	30,8%
	41,7%	40,3%	35,3%	38,8%	39,5%
!					
" "	!				
" "					
" 1"					
1%	42,7%	45,8%	52,3%	56,9%	56,9%
	37,2%	34,8%	29,5%	25,1%	24,7%
!					
" "	!				
" "					
" "					
1%	37,6%	42,0%	50,4%	51,8%	53,8%
	34,5%	29,7%	26,9%	28,0%	27,7%

9 20

2013 .

2009

2

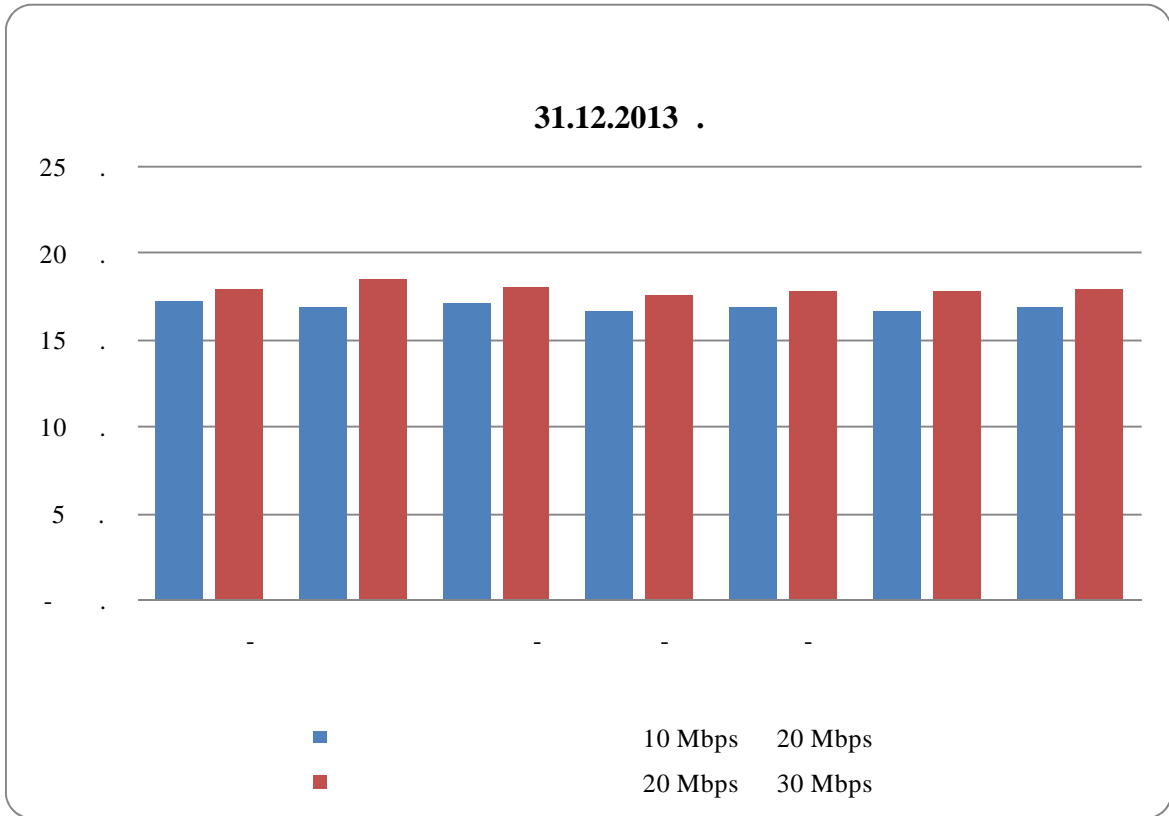
2009 .

() . 1%,

129

(),
10 Mbps.

Mbps , 20 Mbps (30%) 20 Mbps 30 Mbps (22%) . : 10



18

, 1% ,

129

ADSL, LAN, CATV (), 10- 31.12.2013 ..
1% ()

205

(- 1).

2013 .,

2009 -

2012 .,

2012-2013 .

6-

4

3

/

12-

24-

()

, - " (-) ,
 ") , (, 1%
 () , . ,
 " " ,
 , ,
 , (,
) . -
 () ,
 , , - ,
 , , 80%
 , ,
 15 Mbps, 6 Mbps, 80% ,
 , , -
 , .

23

	-	-	-	-	-	-
	14,80 .	14,80 .	14,80 .	14,80 .	14,80 .	14,80 .
" "	14,90 .	14,90 .	14,90 .	14,90 .	14,90 .	14,90 .
" "	N/A	15,90 .	15,90 .	15,90 .	15,90 .	15,90 .
" "	13,00 .	13,00 .	13,00 .	13,00 .	13,00 .	13,00 .
80%*	10,00 .	10,00 .	10,00 .	9,90 .	12,00 .	9,84 .

* - , 80%

2.4.

2014 .,

()

(ADSL), (FTTH, FTTB,
FTTC/FTTN), / - (HFC)
(CATV) (LAN),
Ethernet .

2010-2013 . , 130

() ,

2.4.1.

2010 - 2013 . (

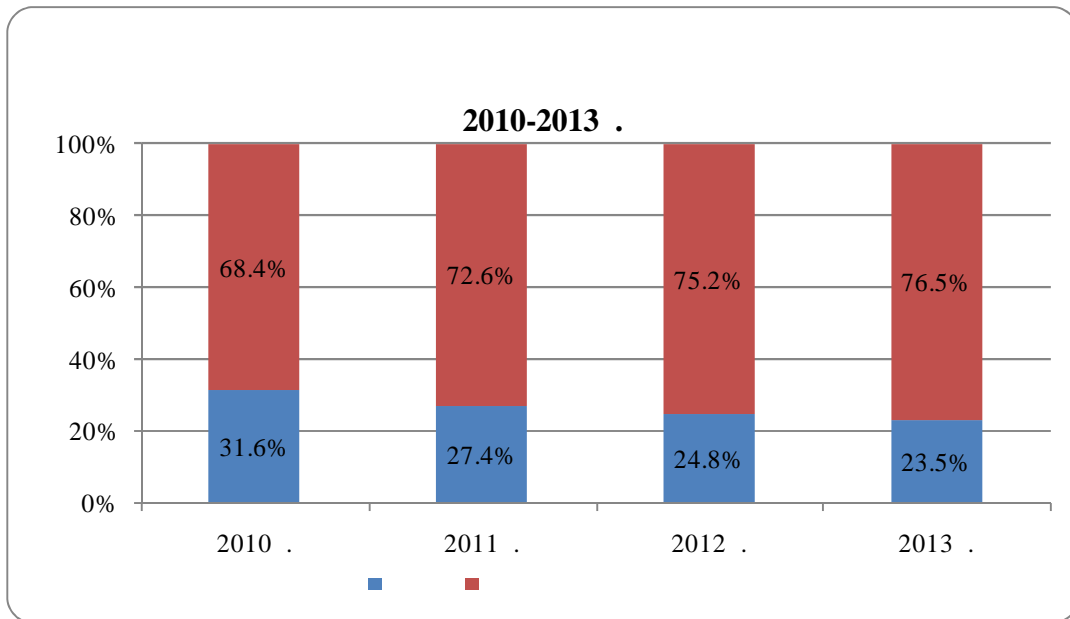
)

19 - .

130

()
(4 5)

2007/879/)



: ,

19

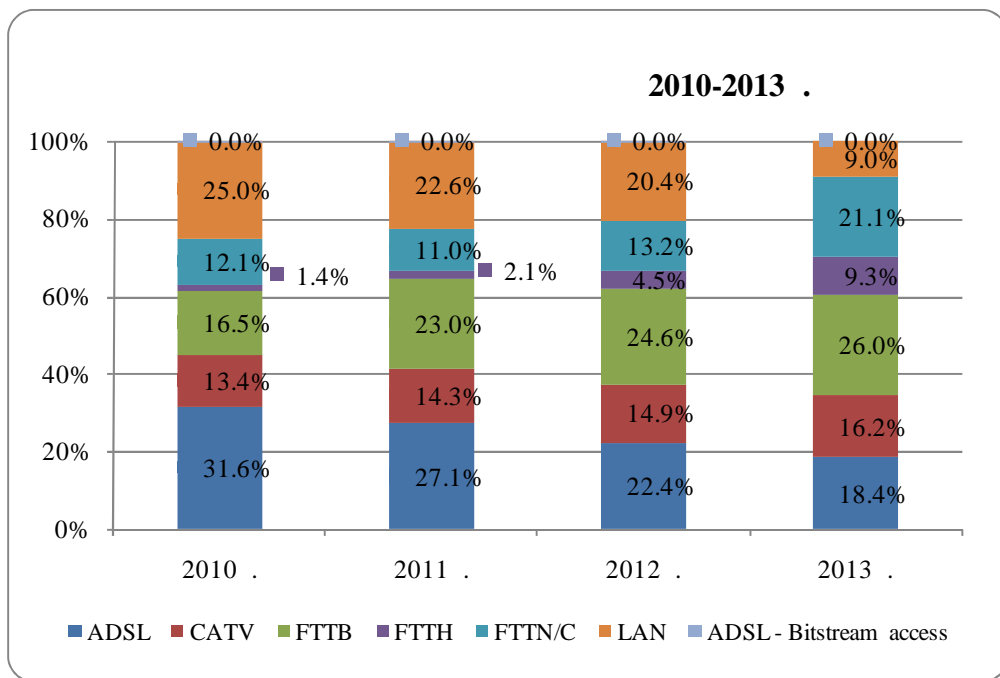
2010-2013 . , 23,5% 2013 .
16,5 .,
1,4%.

25%

CR4=61) 31.12.2013 . (HHI=1066) (CR3=51

- 1000,

10 30 Mbps (52%), 2011 . 2013 . 5
 30 100 Mbps, 18
 40%. (17 . .)
 2 10 Mbps, 5% 2013 . ,
 Digital Agenda Scoreboard 2014, 2014 .
 30 Mbps
 8,3%, 2 - 6,3%.
 (20).



: ,
 20
 - 2013 .
 (56,4%), ADSL 18,4%.
 : 31,6%
 (2010 .) 18,4% (2013 .),
 ADSL FTTx .
 /
 1 2010-2013
 ..
 .
 LAN , DOCSIS 3.0 .
 ,

– Digital Agenda Scoreboard 2014,

2014 . 62%

27%.

2014 .

1%

31.12.2013 .

24

		*			*		
		Mbps (download)	()	()	Mbps (download)	()	()
	ADSL,	15	0/18 .	16,80 .	20	0/18 .	17,80 .
	FTTB, FTTH, LAN	15	18,00 .	16,80 .	100	18,00 .	39,80 .
" "	CATV, FTTN/C, LAN	25	9,90 .	18,99 .	150	9,90 .	32,99 . ¹
" "	FTTH, FTTN/C, LAN	30	0,00 .	18,90 .	100	0,00 .	39,90 .
" "	FTTB, FTTH	15	N/A	13,00 .	100	N/A	19,00 .
" - "	FTTB, FTTN/C	50	9,50 .	20,00 .	96	9,50 .	50,00 .
" 1"	FTTB	25	0,00 .	15,90 .	65	0,00 .	19,90 .
" "	LAN	45	0,00 .	16,00 .	96	0,00 .	26,00 .
" "	FTTB, FTTH	20	30,00 .	20,00 .	40	30,00 .	24,99 .
" "	FTTB, FTTH, FTTC/N, LAN	20	N/A	15,00 .	72	N/A	29,90 .
" "	FTTB, FTTH, CATV	15	0,00 .	14,00 .	50	0,00 .	35,00 .

*

1-

1

LAN

13,00 . 20,00 .,

(Mbps).

2.4.2.

2014 .,

135

136

246/22.02.2011 .

31.12.2013 .,

2012
137

(2007-2009 .),

2010-2013 .,

1”

31.12.2013 .

135
136

246/22.02.2011 .

137 19

ADSL
2014 .,,

V. ,

1.

1.1.

.3, .1 , , , , . 15(1) 2002/21/ .157 . .11 , , ex ante , / , (.4, .1 2) . / , 4, .3) . (.5) (. 1. ; 2. . , / (.4, .4) . , .157 , .1 , ,

150, .1). (.8, .1 (.15, .3 .4, .2, .2), .

4.2.2.1 2014 ., 3 .

3 . (FTTH, FTTB (FTTx) FTTC/VDSL).

§ 1, . 8 ()

(3) Ethernet UTP/FTP

1.2.

✓ ;
✓ ;
✓ ;
✓ ;

1.2.1.

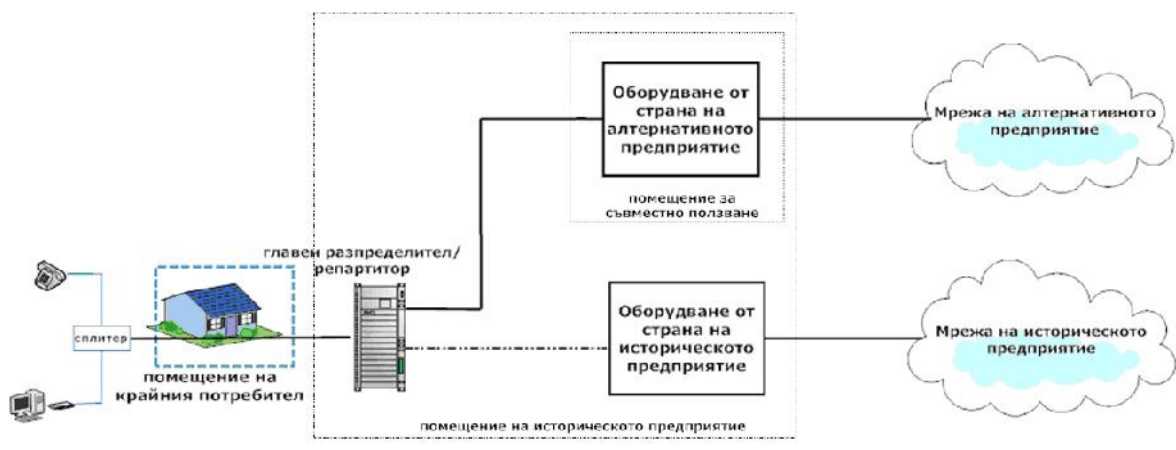
(FTTx)
4¹⁴¹
()
2007 .
1()
142
143
§1, .2
” (FTTB) ” (FTTH).
4
()
PSTN/ISDN
(
2010 . 2013 .)

¹⁴¹

2007 .

¹⁴² Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive), OJ L108/24.04.2002

¹⁴³ ”



(MDF)

ISDN



23

()

➤
(FTTx)

OSI,

4.2.2.1)

FTTH, FTTB

FTTC/VDSL

FTTH
FTTC/VDSL

(FTTH, FTTB

FTTC/VDSL).

FTTH

- FTTH

- FTTH

304/19.06.2014

(IV, . 1.2.1), FTTH

- ;
- (WDM);
- (PON);
- .

FTTH

” ”

WDM

¹⁴⁴ (. 24).

ODF,

WDM

FTTH

”

(. 24).

” ”

” ”

OSI

” ”

¹⁴⁴ ODF- Optical Distribution Frame

FTTH

WDM
”

1:64,

PON
32 64

1:32

FTTH

WDM

2013 .

FTTH

WDM

2013

FTTH

304/19.06.2014

25%

WDM

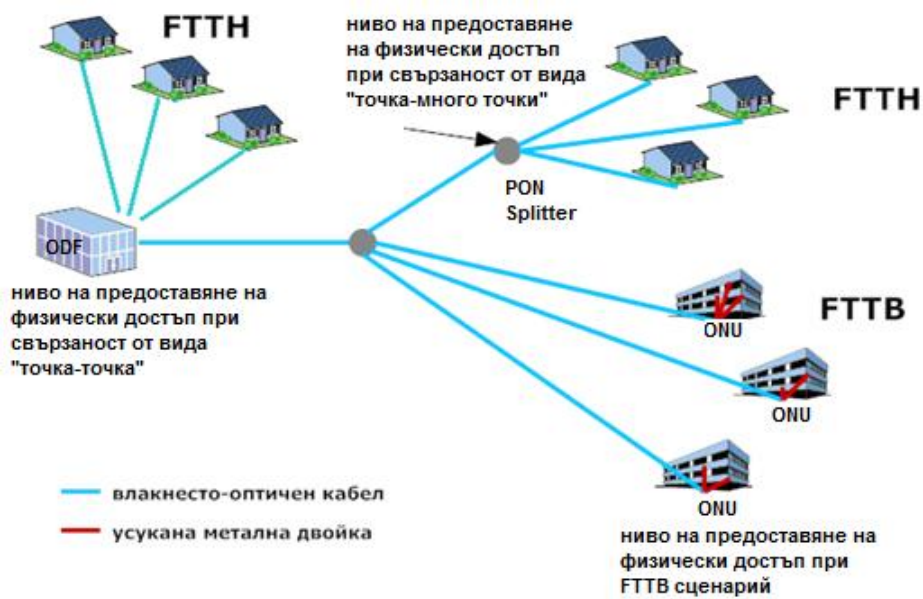
0,7%

WDM

FTTH,

WDM

FTTH/FTTB



24

FTTB

(IV, . 1.2.1) 66%

FTTB

(ONU),

226

UTP/FTP

FTTB

(. 24).

FTTB

100 .

FTTB

PSTN,

Ethernet

UTP/FTP

FTTB

FTTB.

FTTC/VDSL

ADSL

VDSL

(IV, . 1.2.1).

„145

FTTN/FTTC.

FTTN/FTTC ADSL.

(NGN)
(ONU MSAN), FTTN/FTTC.

” ”
FTTN/FTTC

FTTN/FTTC

(VDSL, VDSL2).

FTTN/FTTC ADSL FTTN/FTTC.

” ”
()

FTTN/FTTC

FTTN/FTTC / (LAN). CATV

LAN

FTTH, PON, FTTB

FTTH, WDM

FTTC/xDSL

OSI

()

(VDSL).

,

•

”

”

(

ODF)

/MDF

•

, . . .

(

OSI)

(

)

/

- (QoS).

- NGA (FTTH, FTTB, FTTC/xDSL),

- (" - ") (" (Double tagged VLAN - C-VLAN S-VLAN) , " , VLAN, ;

- (. .) - FTTB FTTN/FTTC) - , , " " . - , () , PSTN FTTN/FTTC.

•

(
,
).
,

/

(/).

/

•

•

•

(FTTH, FTTB FTTC/xDSL).

¹⁴⁶ Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and services

FTTB FTTC/xDSL

FTTH,

: FTTH, FTTB FTTC/xDSL.

FTTC/xDSL),

VLAN),

(*FTTH, FTTB*

1.2.2.

2014 .

DOCSIS 3.0,
500 Mbps

DOCSIS 3.1, / -

DOCSIS 3.0,

2013 . 7

() DOCSIS 3.0,

CATV) 2,8% CATV DOCSIS 3.0 0,5%
(ADSL, FTTx, LAN
40 Mbps.
DOCSIS 3.0

CATV ,

/

CMTS¹⁴⁷ , OSI

2013 . CATV 150 Mbps.¹⁴⁸

2014 . ,

CATV ,

•

(upstream);) CMTS

¹⁴⁷ Cable Modem Termination System –

¹⁴⁸ http://www.blizoo.bg/internet_150.html

LAN , (. . .) ,
") ,
" " 100 (UTP)
IEEE802.3 .
" FTTN/FTTC .

• FTTN/FTTC " ,
" ,

• " , 100 ,
" ,
" ;

• (backhaul) , / ;
" ,

• () ;
" () ,

• LAN , ,
" , ,

FTTN/FTTC (backhaul) LAN

LAN FTTN/FTTC

LAN FTTN/FTTC

. 1.2.1

LAN

FTTN/FTTC

(FTTH, FTTB, FTTC/xDSL)

ODF

, a

FTTN/FTTC

FTTC/FTTN

FTTC/FTTN

FTTN/FTTC

LAN

LAN FTTN/FTTC

LAN FTTN/FTTC

LAN FTTN/FTTC

1.2.4.

149

2014

ADSL2, ADSL2+, VDSL .)

(ADSL,

(backhaul)

(DSLAM)

(backhaul)

(backhaul)

1.3.

/ (.4, .4).
 (.10):
 1.
 ;
 2.
 / .
 (, , , , ,).
 , (.
 :
 • -
 ,
 , 2013 .
 () 5268 ,
 , 80,2% , 2013 .
 , 15,7% FTTx .
 , 195 14.03.2013 .
 -
 , 67,8%, 2013 .
 , 85,7% -
 , 50%¹⁵³.
 • ,
 ,

¹⁵³ , 2002/ 165/03, . 75: „
 „ 50 ,

14.

2014/710/E .

2014 .,

()

(3)

() ,

() ,

(FTTH, FTTB, FTTC/xDSL).

2.

2.1.

(. 1, III V)

. 21

(. 20, . 2) .

4 5 2007/879/ 2013

), (

100%

246/22.02.2011

155 100%, „... (

„)

(self-supply)

ADSL

- FTTH FTTB.

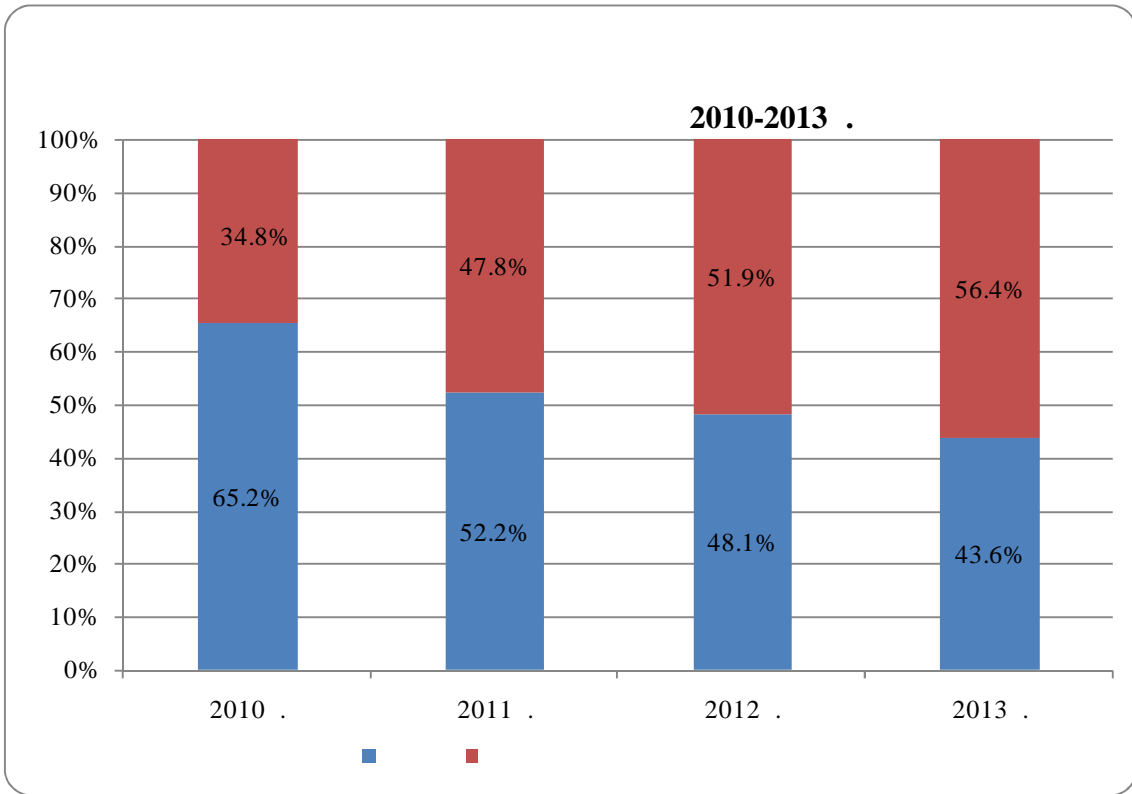
2013

75 - (43,6%)

156 (.26).

¹⁵⁵ BEREC Report on self-supply, BoR (10)09
http://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/171-berec-report-on-self-supply_0.pdf

¹⁵⁶ „



: ,

26

, ,
,
) , 1,5% (

6 IV, . 2.2.1.,

„ ” ” ” ” .
, , , 2 ,
„ ” - 7 „ ” .

157 .

40% , 304/19.06.2014 .

, 50% 6 („ ” 19 „ ”) .

¹⁵⁷ 77 . 75 - United Brands v Commission, op. cit. „The greater the difference between the market share of the undertaking in question and that of its competitors, the more likely will it be that the said undertaking is in a dominant position.”

31.12.2013 .

ISDN/PSTN .

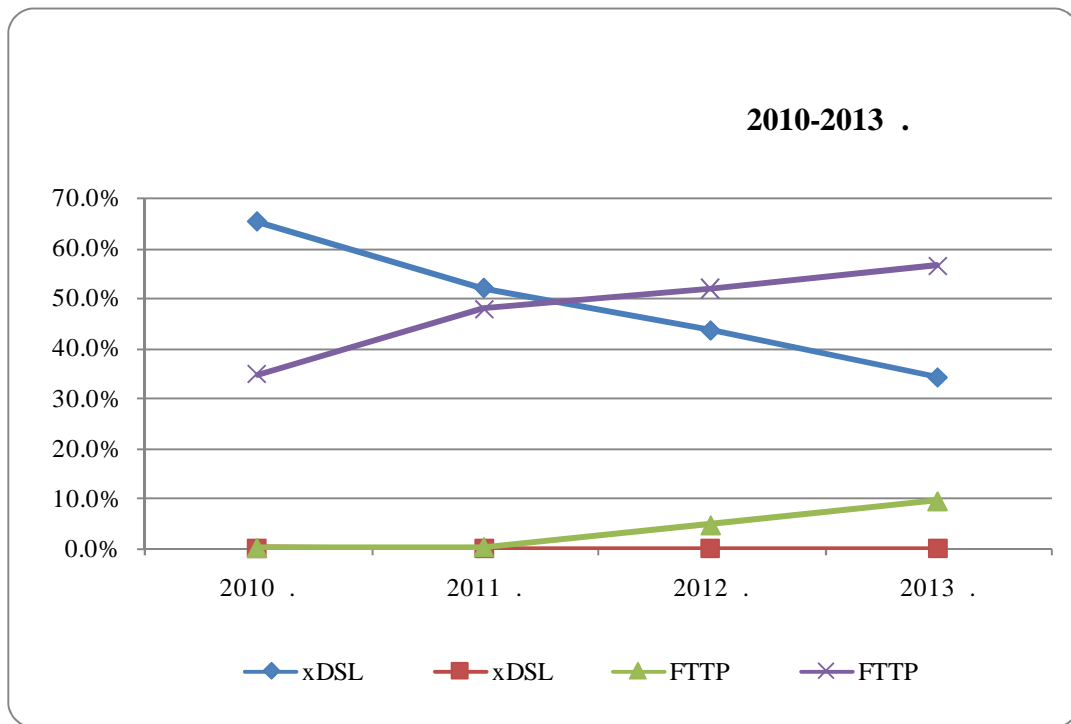
2013 . 98%

2013 .)

5 136%,
- FTTP¹⁵⁸,

(2012-

2010 – 2013 .



27

¹⁵⁸ FTTP - Fibre to the Premises,

FTTB FTTH

.78

.31

2.2.2.

ISDN/PSTN

2.2.2.1.

... ()
80,2%

5

2007 .

4

304 19.06.2014 .

31.12.2013 .

26

	31.12.2011 .	31.12.2011 .	31.12.2013 .	31.12.2013 .
	2	20,9%	7	32,7%
" "	30	42,9%	30	43,6%
" "	12	37,5%	19	40,4%
" 1"	1	16,3%	1	16,9%
" - "	1	2,0%	11	5,5%

31.12.2013 .

7

12

2011-2013 .,

2011 .

2013 .

(„ ...% („ „),

30

...% (

) „

43,6%

159,

30

50%

19

40,4%

IV, . 1.3.

55%

(FTTx),

¹⁵⁹ <http://bulsat.com/optichen-internet.php>

2009 .								
" "	!						87,9%	
" "							79,5%	
" "							0,0%	
							43,2%	
2013 .								
" "	!						97,2%	
" "							88,3%	
" "							82,0%	
							51,1%	

2013 . 3- 57%

2009 .., 48,6%.

97%

2009 .., 53%

2009 – 2013 .., 6

3

..... ().

31.12.2013 .

..... ()

(), 12 - , 2013 .., "

() .

2.2.2.2.

ISDN/PSTN

2.2.2.3.

ISDN/PSTN

ISDN/PSTN
- 67,8%,
85,7% -
- 23,5% (IV, . 2.)
IPTV) - 15,3%,
50%.
25%
25%
246 22.02.2011 .

2010-2013 .			
2010 .	2011 .	2012 .	2013 .
0,0002%	0,0001%	0,0001%	0,0001%

: ,
28 ,

,
4 5.

2.2.5.

/ ()
;

. 2.2.2.

3.

-
-
-
-
-

40%

100%

”

,

”

(3).

VI.

1.

- .
- ,
- :
- .166, .2, .4 .173 ;
 - - .166, .2, .1 ;
 - () - .166, .2, .2 ;
 - - .167, .3 ;
 - - .166, .2, .3 ;
 - - .166, .2, .5 .

2.

246/22.02.2011 .

- () ((4
- 2007/879/), :
- :
-
- :
- , ;
 - (),
 - ;
 - ,

703/30.10.2014 .).

_____ ;
_____ :

- Long Run Incremental Cost - LRIC ((/)), ;

- LRIC,

29

	14.50 .()	4.90 .()

():

_____ ;
_____ :

- ;
- ;
- . V. .1.4. 246/22.02.2011 . ,

_____ ;

- , , ;

NGA .

4.

4.1.

2007/879/ ,

4

(-)

- ;
- ;
- .

(V, .2.4.2), ,

4.1.1.

246/22.02.2011 .

, ()
4 2007/879/ .

:

4.1.1.1.

0 КРС е посочила,
(), .

3 . , /

4.1.1.2.

) ()
, ,
, ,
, 32%
, 66%

(а V, . 2.2.2.1.), 2013 .
57%

4.1.2.2.
)

(a V, .2.2.2.1.)

4.1.3.

4.1.3.1.

PSTN/ISDN

IV, . 2.4.2.),

4.1.3.2.
)

ex-ante

5.

5.1.

2010/572/

(NGA
).

)

2013/466/

(

“ ” 2020” – ”

2010/572/

4 5

2007 .

2010/572/

LRIC+

(31.12.2016 .),

8-10

” (/EoI)
” (/EoO),
xDSL - FTTB.
4 5 2007 .
4 2007 .,
a

” 2020“
(NGA).

5.2.

- . 157
:
- - ;
 - -

5.3.

. 5.1.
3 ,

()				

5.3.2.

. 5.1. .

(.) .

/ , ,

163 .

(31),

¹⁶³ BoR (12) 127

EoI EoO

.5.1.

EoI EoO

(. 5)

2013/466/

(5)

(4)

2007/879/

ex-ante

.7

.6,)

EoI.

5.3.3.

EoI

()

. 167, . 6 , , .
, , .
, , .4
. 5.1., , , ..

5.3.4.

, ,
. , ,
, , .5.1. ,
. , ,
. 5.1., , ,
, , .

5.3.5.

. 4.1.3 , ,
, ,
. , 5.3.1.-5.3.4. - , , ..
, ,
. , PSTN/ISDN
/ - ,
().
. 5.3.2., , .
- ,

PSTN/ISDN /

(),

(retail-minus),

. 220

5.3.5.1.

(IV., . 2.4.1.)

FTTC/xDSL,

(43)

[...]

. 5.1.

. 5.1.

. 5.3.2

(. 5.3.1.

).

. 5.1.,

5.3.5.2.

()

„retail-minus”

(),

()

. 5.1

. 5.1,

„retail-minus”

5.3.6.

5.3.1.-5.3.5.

	✓		✓	
	✓	✓	✓	
	✓	✓		✓

5.4.

5.4.1.

V, . 1.2.

. 4.1.1.

5.3.1.

5.4.1.1.

FTTC/xDSL)

(PSTN/ISDN),

FTTC/xDSL ().

) (backhaul)

;

) (backhaul)

,

,

„backhaul“;

)

,

;

)

5.4.1.2.

” V, .1.2.1.

” (NGA),

()

FTTH/FTTB

” FTTH

..... -

FTTB

..... -

(ODF),

,

,

,

:

)

FTTH/FTTB;

)

) (backhaul),

,

;

) , ;
) , ;
) , ;
” ’ ”.
’
() FTTH/FTTB.
FTTH/FTTB
UTP/FTP ()
-
FTTH/FTTB
,
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(),
:
• (),
,
, ;
• , ,
, ,
, ;
• () ,
, ,

(backhaul).

(backhaul)

(OSS – operational support

systems)

. 5.4.1.1. . 5.4.1.2.

. 174, . 2

5.4.1.3.

()

V, . 1.1 ,

(2009 . 2013 .)

2013 . 72,4%

. 286, . 1 ,

246/22.02.2011 .
)

246/22.02.2011 .,
(

(NGA).

5.4.2.

. 4

. 168 ,

2010/572/

. 5.3.

/

246/22.02.2011 .

PSTN/ISDN

FTTC/xDSL,

(Equivalence of Inputs/EoI)

PSTN/ISDN

703/30.10.2014 .

5.4.3.

. 167, . 1 , : ,
 / , / , , ,
 . 167, . 6 , ,
 / . ,
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 , , .
 (), .
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) ;
) ;
) , ;
) ;
) ()
).

5.4.3.1.

, **FTTC/xDSL** ,
 246/22.02.2011 .
 .
 . 167, . 3
 , , .

5.4.3.4.

03.05.2011 .), . 40 (. - , . 34 2011 ., 2011 .)

5.4.4.

5.4.4.1.

. 167, . 6
- . 5.3.3.
. 163, . 3
1.):
) ;
) ;
) ;
) ;
) (backhaul) ;
) ;
) ;
) ;
2. (backhaul).

5.4.4.2.

()

1603/12.07.2012 .

()

. 167, . 3

1. , :

1. , ,
 , .); (, ,
 2. :
)
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) , , ,
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3. , , , ,
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 4. :
) ,
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) ;
) ;

) ()
)

1882/2012 .

(),

. 5

2005/698/

165

1

2010/572/ ,

1282/28.01.2013 . , VII ., 1882/2012 . ()
10764/15.07.2013 . , 5 . -).

5.4.5.2.

5.4.5.2.1.

FTTC/xDSL

4

2007/879/

()
, FTTC/xDSL,

29

¹⁶⁵ Recommendation 2005/698/EC of 19 September 2005 on accounting separation and cost accounting systems under the regulatory framework for electronic communications, L 266, 11.10.2005, p. 64–69.

158/28.02.2008 .

(Fully Allocated Costing/FAC),
(Current Cost Accounting/CCA).

246/22.02.2011 .

2014 .

(backhaul),

703/30.10.2014 .,

3

(subloop),

-

FTTC/xDSL.

FTTC/xDSL,

246/22.02.2011 .

. 41

2013 .

7,91 166.

7,41

0,50

2,51

(2,38).

FTTC/xDSL,

246/22.02.2011 .

703/30.10.2014 .,

(subloop),

-

2014 .

(
),
2015-2017 .¹⁶⁷,
: 2015 . – 0,1%; 2016 . – 1,1%; 2017 . – 1,6%.

2015 .

/ ,
()
, . 220, . 2, . 1 , ()
) , 33.
- , - .

33

	()
1. ()	20,00 ./
2.	19,00 ./
:	
3.	15,00 ./
4.	12,00 ./

	„ (BACKHAUL) ”	()
5.		600
6.		150
7.	() ()	60
8.	- ()	65
9.	(,)	45
10.	(,)	60
11.		30
12.	/	25

¹⁶⁷ <http://www.minfin.bg/bg/page/851>

	” ”	()
13.		450
	()	
14.	()	60
15.	()	150
16.	()	30
17.		25
18.		
		600
19.		150
20.	()	90
21.	()	45
22.	()	60
23.		30
24.		25

()

	(Sub Loop)		()	()
25.			150	150
26.			210	210
27.			150	150
28.	()*		+ 15%	15% +
29.		100	1016	525
30.		50	520	279
31.		100	38	38
32.		50	19	19
33.	()		62	32
34.			4,9	14,5
35.			35	35
36.			15	15

* , .
 :
 / ,
 ()
 , / ,
 , ,
 , 578/19.08.2014 .
 (IV), 703/30.10.2014 ,
 , . 5
 , ,
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5.4.5.2.2.

. 2.2.2.1

V

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. 13

2010/572/ . . 14

2010/572/ ,

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. 5.3.5. . 5.4.5.2.1

()

246/22.02.2011 .

,

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2011 .

2010/572/ ¹⁶⁸,

-

(), :

;

, . .

;

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-

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” , - . ”

,

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4

2007/879/

/

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, . .

,

¹⁶⁸ BoR (11) 43: http://bereg.europa.eu/doc/bereg/bor_11_43.pdf

()

110

32 ,

4

2007/879/ , :

4 (2007/879/), :

169

-
-
-
-

∇ (),

1.

, : ,
 , :
 -3 PVC 110 - PVC 50%.¹⁷⁰; 75/110
 32/40 ; -3
 PVC ; - 1 3
 ; 35%;
 PVC 20%;
 / 1000 - 22
 .
 2. 25
 3. WACC
 (10,03%), -
 .
 4. - 48%.
 5. (22
 1000) ,
 .
 6. - 5%
 7. - ,
 , 3% , -
 8. - - 10%.
 1 8 , :

34

		/
1.		
1.1.	„ ”	0,46
1.2.	„ ”	0,43

:

(NGA),

$$S = \left\{ \left(\frac{D \cdot 1,6}{2} \right)^2 \cdot f \right.$$

S

D

1,6

=3,14

ANSI¹⁷³/TIA¹⁷⁴/EIA¹⁷⁵ 569-A

„Commercial Building Standard for Telecommunication Pathways and Spaces”.

20% 40%

40%.

¹⁷¹

¹⁷²

¹⁷³ American Standards National Institute

¹⁷⁴ Telecommunications Industry Association (TIA):

¹⁷⁵ Electronic Industries Alliance (EIA).
Internet Security Alliance

TIA, Electronic Components Association,

40 %.

$$S_1 + S_2 + S_3 = 40\% S;$$

$$f(r_1^2 + r_2^2 + r_3^2) = f\left(\frac{d_1^2}{4} + \frac{d_2^2}{4} + \frac{d_3^2}{4}\right) = 0,4S;$$

$$S = \frac{f}{0,4} \left(\frac{d_1^2}{4} + \frac{d_2^2}{4} + \frac{d_3^2}{4}\right) = f \cdot 2,5 \left(\frac{d_1^2}{4} + \frac{d_2^2}{4} + \frac{d_3^2}{4}\right) = f \cdot (1,6)^2 \left(\frac{d_1^2}{4} + \frac{d_2^2}{4} + \frac{d_3^2}{4}\right)$$

:

S

S_1, S_2, S_3

d_1, d_2, d_3

r

1603/12.07.2012 .

246/22.02.2011 .,

IV

		()
1		
1.1.	1 ,	33
1.2.		35
1.3.	1 ,	25
2		/
2.1.		
2.1.1.	" "	0,46
2.1.2.	" "	0,43
2.2.		110:
2.2.1.	/ 40	0,21
2.2.2.	/ 40	0,22
2.2.3.	/ 32	0,13
2.2.4.	/ 32	0,14
2.2.5.	/ 25	0,08
2.2.6.	/ 25	0,09
2.2.7.	/ 20	0,05
2.2.8.	/ 20	0,06
2.3.		0,13
2.4.	' 50	0,05
3.		
3.1.		6
3.2.		35
3.3.		53
3.4.	1 ,	5,62
3.5.	1 ,	7,5
3.6.	'	35

:

, 29.05.2014 .,

(25 20)

,

,

40/23.01.2014 .,

4

2007/879/ ,

()

1%

)

,

- 3% (

1603/12.07.2012 .,

:

2014 .;

1603/12.07.2012 ;

1603/12.07.2012 .

(),

35,

1603/12.07.2012 .,

29.05.2014 .

5.4.6.

4)

ex-ante

(VI, .

VI, . 5.1. .

(... ; .)	
(... ; .)	
(; ; ; .)	() (; ; ; .)
(;)	(; ; .)
(; ; .)	(; ; ; ; -) , - , - ,

: „()”

„ - ” (cost-benefit analysis, CBA). CBA ,
 - , () ,
 , „ - ”

(NPV), . . . CBA

5.4.6.1.

. 5.4.1.-5.4.5.

75 000

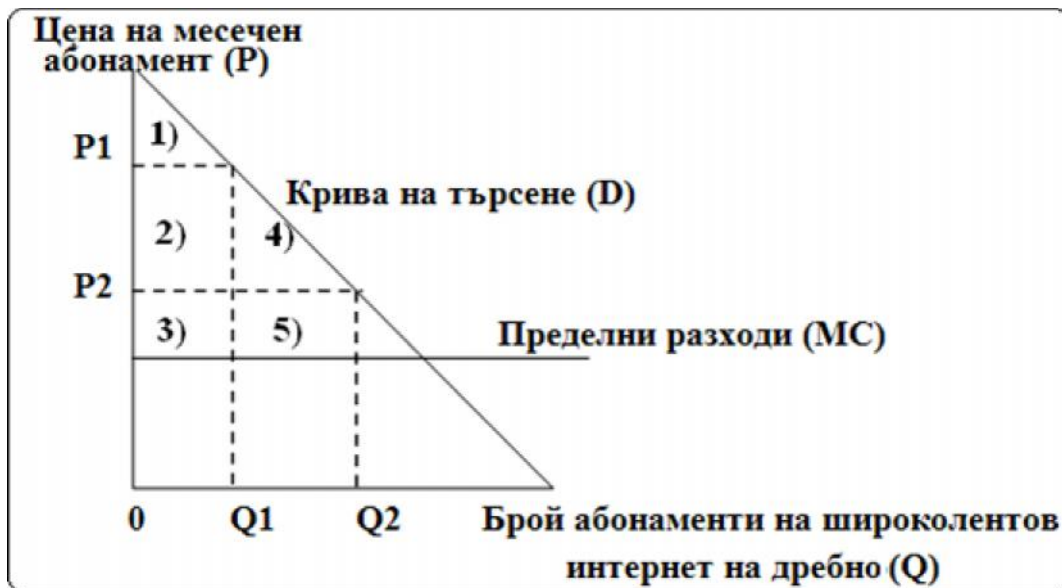
177

2013

5.4.6.2.

NGA

¹⁷⁷ “Broadband market analysis - Unbundled access at the wholesale level”, OPTA/AM/2010/200209, 2010.



28.

28

28

1) 28,
2) 3).

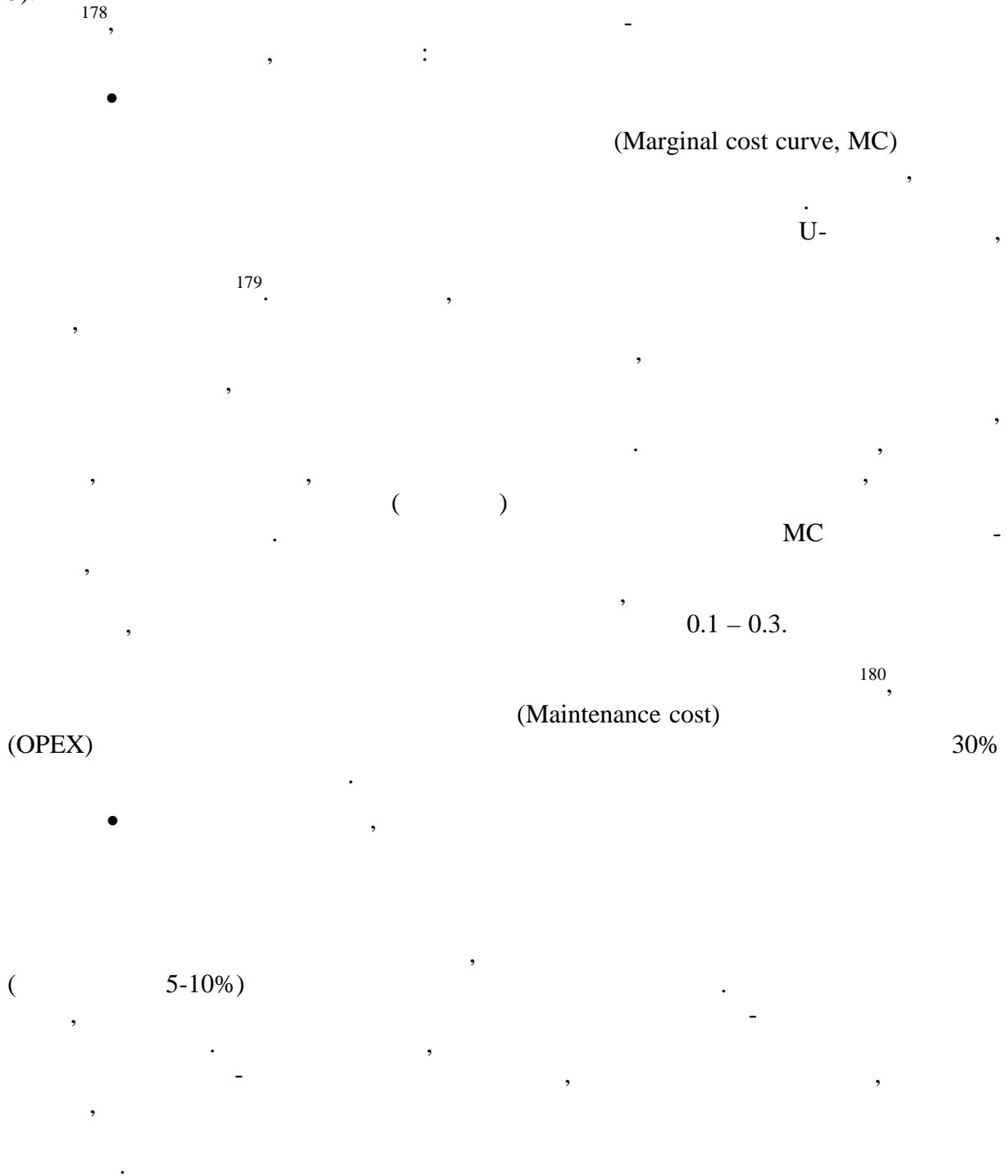
5). 1), 2) 4),

3)

4)

314

5).



178 . 2) = $Q_1 \times (P_1 - P_2)$; . 4) = $\frac{1}{2} (Q_2 - Q_1) \times (P_1 - P_2)$; . 5) = $(Q_2 - Q_1) \times (P_2 - MC)$
 $dWE = 4) + 5) = \frac{1}{2} (Q_2 - Q_1) \times (P_1 - P_2) + (Q_2 - Q_1) \times (P_2 - MC) = (Q_2 - Q_1) \times [\frac{1}{2} (P_1 - P_2) + (P_2 - MC)] = (Q_2 - Q_1) \times$
 $(\frac{1}{2} (P_1 - P_2 + 2 P_2 - 2 MC)) = (Q_2 - Q_1) \times [\frac{1}{2} (P_1 + P_2 - 2 MC)]$
 $dCS = 2) + 4) \frac{1}{2} (Q_2 + Q_1) \times (P_1 - P_2)$
 $dPS = 5) - 2) = MC \times (Q_1 - Q_2) + P_2 \times Q_2 - P_1 \times Q_1$
 179

180 : „Bottom-up cost model for the fixed access network in Spain”, WIK-Consult GmbH, 2012.

181

182 (Ed)

Oxera OFCOM

-0.5 -0.1¹⁸³ -0.3¹⁸⁴

185

10%,

5.4.6.3.

- / PSTN/ISDN

181
182

Ed (>1),

Ed (<1),

¹⁸³ “Review of BT’s network charge controls, Explanatory statement and Notification of proposals on BT’s SMP status and charge controls in narrowband wholesale markets”, Ofcom, 2005;
¹⁸⁴ “Review of price elasticities of demand for fixed line and mobile telecommunication services”, Oxera, 2003;
¹⁸⁵ : “A social time preference rate for use in long-term discounting”, Oxera, 2002.

5.4.6.4.

. 5.4.6.

37

37

	CS	PS	WE			
/	(1)	(2)	(3)=(1) + (2)	(4)=(3) + (5) + (6)	(5)	(6)
1	18,876,263	(14,517,413)	4,358,849	4,284,463	(16,136)	(58,250)
2	16,988,636	(13,065,672)	3,922,964	3,856,017	(14,522)	(52,425)
3	15,289,773	(11,759,105)	3,530,668	3,470,415	(13,070)	(47,183)
	51,154,672	(39,342,191)	11,812,481	11,610,895	(43,729)	(157,858)

∴ (xxx)

CS – ; PS – ; WE-

51 154 672 .

4 358 849 .

11 610 895 .

d = -0.1 d = -0.5

3 738 766 . 19 471 591 .

„ MAN ¹⁸⁷„ MAN , , , ,

1.2.

- ✓ *FTTx* ;
- ✓ /
- ✓ ;

1.2.1.

(FTTx)) , 2014 .
(FTTx), , -
, , ,
(.8, .1 .4, .2,
.2).
- , . 4.2.2.2
2014 . , ,
• („ ”), (best effort
QoS);

¹⁸⁷ <http://www.vivacom.bg/web/files/richeditor/terms/prilojenie-2-uslugi-16-bg-BG.pdf>

- (contention ratio);

- (

- ;

- (

3 (V, . 1.2.1).

” a FTTx

—
(FTTx)
”

OSI

()

CATV

DOCSIS 3.0.

OSI

a

VI)

(

(. 1.2

(

)

DOCSIS 3.0,

DOCSIS 3.0,

DOCSIS 3.0,

CATV

CMTS

C TV

DOCSIS 3.0,

CATV

1.2.3.

2007 .

FTTB FTTC/FTTN

4 5

LAN

FTTx,

LAN

3 ,

UTP/FTP , LAN

Ethernet

, LAN

() (UTP/FTP) .

PSTN/ISDN

FTTC/xDSL;

(*FTT*) ,

CATV ;

LAN .

1.3.

- . 10
- :
1. ;
 2. / .

(, , ,) .

, (:) .

- - ,

, 2013 .
() 5268 ,
 , 80,2% . 2013 .

15,7% FTTx .

- ,

,

- ,

1.4.

,

2014/710/E .
PSTN/ISDN , FTTC/xDSL, (3) ,
(FTT) , - .

2.

III , ,

(modified Greenfield approach).

modified Greenfield approach,

246 2008 191
22.02.2011 2009

31.12.2013

()

() 192

) 193

(IV, . 2.4.1. . 2.4.2.)

),
23,5%.

¹⁹¹ § 5, . 3 () 1748/16.09.2004 .,
1742/12.09.2005 . 1317 2006 . , § 7 ,

()

100-0001 28.01.2005 .

¹⁹² BEREC Report on self-supply, . 14: „This is in particular the case in those instances where the wholesale input that is the subject of the market 5 analysis is not being traded in the market, neither by alternative operators nor by the SMP operator itself. In those instances, it would be necessary to create a notional market, where the self supply of the operators (derived from sales at the retail level) would be determinative for the market analysis that needs to be undertaken.”

¹⁹³ BEREC Report on self-supply, . 8: „In such a case, a notional market has to be defined, where self supply is taken into account, usually by considering that the market shares in the downstream retail market reflect the market shares in the notional market.”

IX.

1.	366
2.	366
3.	366
4.	367
5.	” ”	
	”	367
	368
1 -	369
2 -	
,	371
3 -	
	377
4 -	379
5 -	381

1.

:

1.1.

,

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1.2.

,

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2.

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:

⇒

2002/19/

7

2002 .

();

⇒

2002/22/

7

2002 .

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⇒

() 8 1998 .

(2 -

⇒

(98/322/E);

19

2005 .

⇒

(2005/698/E);

:

⇒

(2005/698/E)

;

7 2009 .

(2009/396/).

1.

219, .5

()
()

(Current Cost Accounting – CCA).

(Historical Cost

Accounting – HCA),

() ;

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2.

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1.

(IAS)

(IFRS).

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2.

- , - :
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- , ;
- , ;
- ;
- , ;
- ex ante ;
- ,

1.

(NGN NGA) -

()

” ()

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2.

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(, ,);

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 - , :
 • ” “
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 • ” “
 • ” “

, , - , (NGN NGA)
 , - .
 . , “ ” “
 ” “ ” “

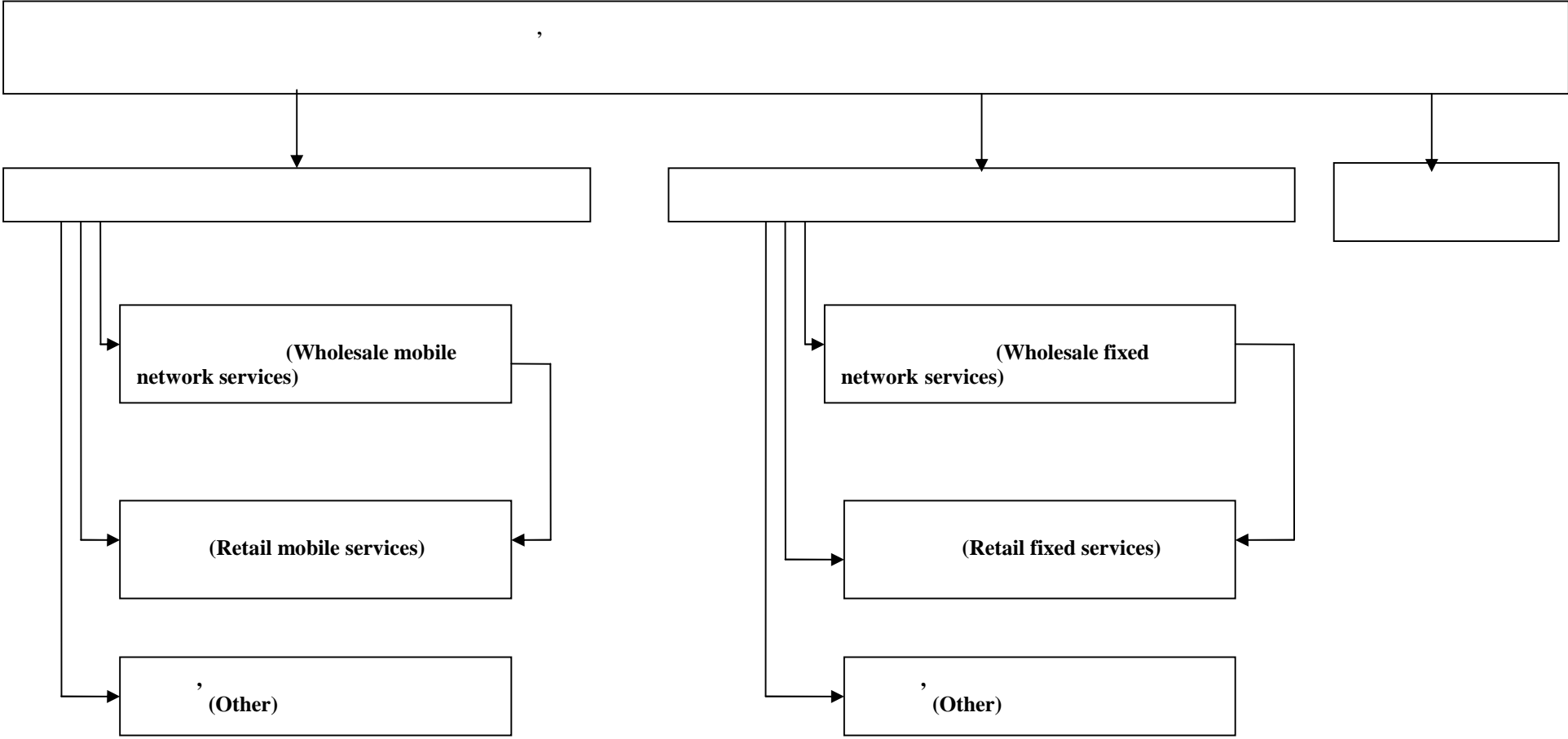
, :
 • ” “
 • ” “
 • ” “
 , / ,
 :

1) (Wholesale mobile
 network services);
 2) (Retail mobile services);
 3) , 1) 2).

1) (Wholesale fixed
 network services);
 2) (Retail fixed services);
 3) , 1)
 2).

1 - , ,

, .



3.

2009” (Regulatory Scorecard 2009)

– European Competitive Telecommunications Association (ECTA)¹⁹⁶

– BIPT.

– OFCOM,

– ComReg

OFCOM ComReg,

(Access)

(Core)

()

ComReg

197

4.

2005 .”

§ 5

. 4

¹⁹⁶ <http://www.ectaportal.com/en/REPORTS/Regulatory-Scorecards/Regulatory-Scorecard-2009/>

¹⁹⁷ http://www.comreg.ie/publications/response_to_consultation_document_no_09_75_and_final_direction_and_decision_accounting_separation_and_cost_accounting_review_of_eircom_limited.507.103728.p.html

2

V.

$$\frac{\text{Cost (FAC)}}{\text{Activity}} = \text{Activity Based Costing (ABC)}$$

1.

ABC . Activity Based Costing –

() ,

-
-
-
-

Cost (FAC)

Fully Distributed Cost (FDC).

– Fully Allocated

• ;
• ;
• ;
• ,
• (. . ”).
”).

3, - -

4, - -

3

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4

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3-			
			(Wholesale mobile and/or fixed network services)".
			(Wholesale mobile/ fixed network services)
			(Wholesale mobile/ fixed network services)
			(Wholesale mobile/ fixed network services)
			(Wholesale mobile/ fixed network services)
			(Wholesale mobile/ fixed network services)
			(Wholesale mobile/ fixed network services)

		/ , ,	” ” / (Wholesale mobile/ fixed network services)
	, .	/ , , (	” ” / (Wholesale mobile/ fixed network services)
,		/ , , ,	/
		/	/
		/	/
		/	/
()		, ,	
		/	
		,	
		, .	

4 – ()*			
			,
1. – : –		” ” ” ”	/ (Wholesale mobile/ fixed network services)
			/ (Wholesale mobile/ fixed network services)
			/ (Wholesale mobile/ fixed network services)
		” ”, / –	/ (Wholesale mobile/ fixed network services) „ ”
			/ (Wholesale mobile/ fixed network services)
1. – : –		” ”, ”	/ (Wholesale mobile/ fixed network services)
		” ”, ”	/ (Wholesale mobile/ fixed network services)
	local loop	ISDN , ()	/ (Wholesale mobile/ fixed network services)
			/

			(Wholesale mobile/ fixed network services)
		-PSTN/ -ISDN	/ (Wholesale mobile/ fixed network services)
	/		/ (Wholesale mobile/ fixed network services)
1. - :			/ (Wholesale mobile/ fixed network services) ”
			” ”
			” ”
2.			/ (Wholesale mobile/ fixed network services)
			/ (Wholesale mobile/ fixed network services)
			/ (Wholesale mobile/ fixed network services)
3.		/	
		/	
		/	

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:)	.	
)	.	
)	,	
) (.	,	
)	/	
)	/	
)	,	
)	,	
)	,	
)	”	”

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(98/322/E).

(2 -

() 8 1998 .

4.

. 13.1. 2002/19/ (),

/

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,

4.1.

(Weighted average cost of capital - WACC)

:

$$WACC = r_e \cdot E/(D+E) + r_d \cdot D/(D+E)$$

:

r_e ,

r_d ,

D .

:

$$WACC = \frac{r_e}{1-t_e} * \frac{E}{(D+E)} + r_d * \frac{D}{(D+E)} ;$$

t_e e

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,

(BULRIC)

(WACC).

4.2.

(WACC)

$$+ \left(\frac{\quad}{\quad} \right) = 198$$

(current valuation

methodologies),

4.3.

1252 12.10.2009 .

04-04-658/26.11.2009 . , 04-04-602/23.11.2009 . ,
04-04-602/23.11.2009 . , ,

3

() ,

4.4.

4

- WACC.

5.

(Wholesale mobile/fixed network services)

5.1.

(
 “ / ”.
) “ /
 “ / ”
 ().
 “ / ”
 (Wholesale mobile and/or fixed network).

” (Wholesale mobile/fixed network services).

“ / ”.
 ”.
 ”.
 ”.

(Wholesale mobile/fixed network services).

5.2.

()

(Wholesale mobile/fixed network services)

5.3.

()

()

6.

(Retail)

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V.

1.

• Stand-alone cost (SAC);
 • Fully allocated cost (FAC) "Fully distributed cost (FDC)";
 Long Run Incremental Cost (LRIC) ()
 " (FDC/FAC).

2.

(Historical cost accounting),
 Cost Accounting - CCA). (Current

(Gross replacement cost
 - GRC)

(Net Current Replacement Cost).

()

(GRC)

- (. . .) ;
- ;
-

(MEA)

()

- (CCA), ;
- ;
- (NRC),
- ;
- (“); (, ”
-

(CCA)

(GRC)

” (FDC/FAC), ”

(CCA).

FDC/FAC

•
•
•
, ;
, (CCA),
()
(CCA).

V .

1.

- 1.
 - 2.
 - 3.
 - 4.
- 2012 ., .9 .12.

2.

- 5.
 - 6.
 - 7.
 - 8.
 - 9.
 - 9.1.
 - 9.2.
 - 10.
 - 11.
- 4
- ” ”
- ()
- () ,
- (ABC) .
- 6.
- (4.4.1. 4.4.10.)
- 5

3.

- 12.
 - 13.
- 30
- 13, . 5,
- . 12
- :

➤ (FDC/FAC),

➤ ,

➤ ;

➤ ,

➤ ;

➤ WACC;

➤ ;

➤ (), /

➤ ;

➤ /

➤ ;

➤ / ,

14.

15.

4.

16.

17.

18.

5.

19.

➤ : - 30

➤ ; -

➤ 30 ;

➤ , , , ,

➤ , ”

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1-

1. ” / / / , / / . , , , . / , , . / ” ” , , , .

UMTS

() GSM / , . , , , . ” / , ” 1. ” / ” .

2.

” / (Retail)” , , , , SIM . ” / , , . ” / ” , , . ” , , . / , , , SIM .

3.

” ” , , , .

1.

- 1.1. ” ”:
 - 1.1.1. : (2 on-net);
 - 1.1.2. (2 off-net);
 - 1.1.3. (F2M on-net);
 - 1.1.4. (F2 off-net).
- 1.2. 199:
 - 1.2.1. (M2F on-net);
 - 1.2.2. (M2F off-net);
 - 1.2.3. (F2F on-net);
 - 1.2.4. (F2F off-net).
- 1.3.
- 1.4.
- 1.5.
- 1.6. :
 - 1.6.1. ;
 - 1.6.2. .
- 1.7. :
 - 1.7.1. ;

199

- 1.7.2.
- 2. ” ”:
- 2.1. ():
- 2.1.1. ;
- 2.1.2. SMS, MMS;
- 2.1.3. ;
- 2.1.4. .
- 2.2. ():
- 2.2.1. ;
- 2.2.2. SMS, MMS;
- 2.2.3. ;
- 2.2.4. .
- 2.3. :
- 2.3.1. ;
- 2.3.2. SMS, MMS;
- 2.3.3. ;
- 2.3.4. .
- , ,

- 1. ” ”:
- 1.1. :
- 1.1.1. (F2F on-net);
- 1.1.1.1. ;
- 1.1.1.2. .
- 1.1.2. (F2F off-net);
- 1.1.2.1. ;
- 1.1.2.2. .
- 1.1.3. (F2M on-net);
- 1.1.3.1. ;
- 1.1.3.2. .
- 1.1.4. (F2M off-net);
- 1.1.4.1. ;
- 1.1.4.2. .
- 1.1.5. (
- ” ”).

1.2.

1.2.1.

(F2F on-net);

1.2.1.1.

1.2.1.2.

1.2.2.

(F2F off-net);

1.2.2.1.

1.2.2.2.

1.2.3.

(2F on-net);

1.2.3.1.

1.2.3.2.

1.2.4.

(2F off-net);

1.2.4.1.

1.2.4.2.

1.3.

1.4.

1.4.1.

1.4.2. 2048 kbit/s

1.4.3. 2048 kbit/s

1.4.4.

19”

1.4.5.

48V

VA	220	440	660	880	1100	1320	1540	1760	1980	2200	2420	2640	2860	3080	3300	3520
1/2																
1/4																

1.4.6.

60V

VA	220	440	660	880	1100	1320	1540	1760	1980	2200	2420	2640	2860	3080	3300	3520
1/2																
1/4																

1.4.7.

1.4.8. 2048 kbit/s

1.4.9. 2048 kbit/s

1.4.10.

1.5.

1.5.1.

1.5.1.1.

1.5.1.2.

1.5.1.3.

1.5.1.4.

1.5.1.5.

1.5.1.6.

1.5.1.7.

1.5.1.8.

(backhaul)

1.5.2.

1.5.2.1.

1.5.2.2.

1.5.2.3.

1.5.2.4.

1.5.2.5.

1.5.2.6.

1.5.2.7.

1.5.2.8.

(backhaul)

1.6.

1.6.1.

1.6.1.1.

1.6.1.2.

1.6.1.3.

1.6.1.4.

1.6.2.

1.6.2.1.

1.6.2.2.

1.6.3.

1.6.3.1.

1.6.3.2.

- 1.7. (bitstream):
 - 1.7.1. :
 - 1.7.1.1. DSLAM;
 - 1.7.1.2. (parent node);
 - 1.7.1.3. (distant node);
 - 1.7.1.4. IP (BRAS).
 - 1.7.2. :
 - 1.7.2.1. DSLAM;
 - 1.7.2.2. (parent node);
 - 1.7.2.3. (distant node);
 - 1.7.2.4. IP (BRAS).
- 1.8. :
 - 1.8.1. :
 - 1.8.1.1. / PSTN ;
 - 1.8.1.2. / ISDN (2B+D) ;
 - 1.8.1.3. / ISDN (30B+D) .
 - 1.8.2. :
 - 1.8.2.1. PSTN ;
 - 1.8.2.2. ISDN (2B+D) ;
 - 1.8.2.3. ISDN (30B+D) .
- 1.9. .
- 2. - „ (Retail)”.
 - 2.1. ():
 - 2.1.1. PSTN ();
 - 2.1.2. ISDN 2B+D;
 - 2.1.3. ISDN 30B+D;
 - 2.1.4. xDSL () ;
 - 2.1.5. . ;
 - 2.1.6. ;
 - 2.1.7. – ;
 - 2.1.8. – .
 - 2.2. :
 - 2.2.1. PSTN ();
 - 2.2.2. ISDN 2B+D;
 - 2.2.3. ISDN 30B+D;2
 - 2.2.4. xDSL () ;
 - 2.2.5. . ;
 - 2.2.6. ;
 - 2.2.7. – ;
 - 2.2.8. – .
 - 2.3. :

2.3.1.

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2.3.2.

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2.3.3.

”

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2.3.4.

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700, 800, 90

1;

2.3.5.

xDSL (

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2.3.6.

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2.3.7.

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2.4.

:

2.4.1.

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2.4.2.

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2.4.3.

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2.4.4.

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2.4.5.

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2.4.6.

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3 -

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1.

- 1.1. ;
- 1.2. ;
- 1.3. ;
- 1.4. ;
- 1.5. ;
- 1.6. ;
- 1.7. – MDF;
- 1.8. – DDF;
- 1.9. – ODF;
- 1.10. – MSAN;
- 1.11. Soft switch;
- 1.12. Signaling Gateway;
- 1.13. Trunk Gateway.

2.

- 2.1. ;
- 2.2. – ;
- 2.3. – ;
- 2.4. – ;
- 2.5. – ;
- 2.6. – ;
- 2.7. – ;
- 2.8. – ;
- 2.9. – ;
- 2.10. – .

3.

- 3.1. – ;
- 3.2. ;
- 3.3. – xDSL;
- 3.4. – PDH;
- 3.5. – SPDH;
- 3.6. – SDH;
- 3.7. – WDM;
- 3.8. – IP Core network;
- 3.9. – ;
- 3.10. – PDH;
- 3.11. – SDH;
- 3.12. – LMDS;
- 3.13. – ;
- 3.14. ;
- 3.15. ;
- 3.16. ;
- 3.17. ;

- 3.18. ;
 - 3.19. ;
 - 3.20. ;
 - 3.21. / ;
 - 3.22. ;
 - 3.23. ;
 - 3.24. .
1. GSM BST;
 2. UMTS Node B;
 3. GSM- BSC;
 4. UMTS- RNC;
 5. TCU;
 6. Repeater;
 7. NI;
 - ;
 - ;
 8. NOC;
 9. - OMC-R (Radio
 - OMC);
 10. MSC;
 11. SSW;
 12. SMSC;
 13. SGSN (GPRS);
 14. SGGSN (GPRS
 -);
 15. STP;
 16. NOC:
 - UMTS UMTS-OSS;
 17. () -
 - OMC-S (Switched OMC);
 18. a VMS;
 19. / () (” ”
 - HLR, ” ”
 - VLR, EIR,
 - AUC);
 20. IN Platforms;
 21. Provisioning system;
 22. Billing system;
 23. (Mediation
 - device);
 24. IT;
 25. Other Platforms.

4.

4.1.

- 1. 4.1.1. - ()
20 . . .
- 2. 4.1.1. - () 20 , . . .
- 3. 4.1.2. - () 20 ., . . .

4.2.

- 4. 4.2.1. - " , . 1, II
- 2 20 .
- 5. 4.2.2. - " , . 2, II
- 2 20 .
- 6. 4.2.3. - " , . 1, I
- 2 20 .
- 7. 4.2.4. - " , . 2, I 20 .
- 8. 4.2.5. - " , . 1, II
- 2 20 .
- 9. 4.2.6. - " , . 1, I
- 2 20 .
- 10. 4.2.7. - " , . 2, II
- 2 20 .
- 11. 4.2.8. - " , . 2, I 20 .

4.3.

- 12. 4.3.1. - ()
" - 20 .
- 13. 4.3.2. - ()
" - 20 .
- 14. 4.3.3. - ()
" - 20 .
- 15. 4.3.4. - ()
" - 20 .
- 16. 4.3.5. - ()
" 20 .
- 17. 4.3.6. - ()
" 20 .

4.4.

- 18. 4.4.1. - .
- 19. 4.4.2. - 20 .
- 20. 4.4.3. - 20 .
- 21. 4.4.4. - 20 .
- 22. 4.4.5. - 20 .
- 23. 4.4.6. -

"Retail minus" (195/14.03.2013 .) ,
20 .

- 24. 4.4.7. - 20 .
- 25. 4.4.8. - 20 .
- 26. 4.4.9. - 20 .
- 27. 4.4.10. - 20 .

4.5.

- 28. 4.5.1. - 20 .
- 29. 4.5.2. - 20 .

4.6.

- 30. 4.6.1. - " " 20 .
- 31. 4.6.2. - " " 20 .
- 32. 4.6.3. - " " 20 .
- 33. 4.6.4. - " " 20 .

4.7.

- 34. 4.7.1. - .
- 35. 4.7.2. - .

4.1.

4.1.1 -
20

()

: , .
() ().

” , ” 2”:

• ” - ” , ” 1, , 2
(”).

• ” - ” , 2 , 1,
(” ”).

• ” - ” , 1, . 2,
(: ” ”).

• ” - ” , 2, (” ”)
”).

• ” - ” , 2, I 2, ,
” .

• ” - ” , 2, 2, 2,
” .

• ” „F” , (” ” „ ” „D” ” ” .
” , (2)”:

• ” „G” , ,

• ” „H” „I” „J” 1, . 2.
, 2.

• „J”. „ ” „G”, „H”, „I”
 • „L” ()
 • „M” („K”, „L” „M”).
4.1.3. - () ()
20 : , . / ,
 : ,
 „ , (,
2)”: „ - ” , (,
 • „ - ” . 1, II
 „ 2. ” ,
 • „ - ” ,
 „ 2. ” . 1, I
 • „D - ” „ -
 „ , . 2, II ” 2
 • „ „F” „ ” . 2, I 2. „B”, „C”, „D” „E”.
 „ , (,
2)”: • „G” , „ ”
 • „ ”, „I” „J” I. 2. ,
 2, .
 • „ ” „G”, „H”, „I”
 • „J”. „L” ()
 • „M” („K”, „L” „M”).

4.2.

·
:
2,
·
" 4.2.1. - " , .1, II
2 20 . " ,
") ,
, , .1 II
2,
" 4.2.2. - " , . 2, II
2 20 . " ,
, (, .2 II
2)
" "·
" 4.2.3. - " , .1, I
2 20 . " ()
, " " ,
(.1 I 2) .
" 4.2.4. - " , .2, I 20 .
, (.2 I 2)
· "·
" 4.2.5. - " , .1, II
2 20 . " ,
,
(.1 II 2) .
" 4.2.6. - " , .1, I
2 20 . " ,
,
(.1 I 2) .

" 4.2.7. - " , . 2, II
2 20 .

(. 2 ' II 2) .

" 4.2.8. - " , . 2, I
2 20 .

(. 2 ' II 2) .

4.3. ()

: , 2,

" 4.3.1. - " - (20) .

" 4.3.2. - " - (20) .

" 4.3.3. - " - (20) .

" 4.3.4. - " - (20) .

" 4.3.5. - " 20 . () .

4.2.2., " " " .

" 4.3.6. - " 20 . ()

4.2.4., " " " .

4.4.

:

/
/

4.4.1. – 4.4.10.

4.4.1. -

4.4.2. -

20 .

4.4.3. -

20 .

4.4.4. -

20 .

4.4.5. -

20 .

4.4.6. -

"Retail minus" (195/14.03.2013 .)
20 .

4.4.7. -

20 .

4.4.8. –

20 .

4.4.9. -

20 .

4.4.10. –

20 .

4.5.

4.5.1. -

20 .

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/ , / , / , /
4.7.2. -
31.12. 31.12.
/ CAPEX > .
4.1.1. 4.1.3.

4.1.1. -

()

.....()..... 20 ..

	A	2				F	2)				K	L	M
		B	C	D	E		G	H	I	J			
1													
2													
3	() ()												
4													
5	%												
6													
7	() ()												
8	%												
9	+WACC (...%)												
10	+ WACC (.....%)												

. 313

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(,)

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(,)

4.1.2. -

()().....

20 .. .

	A	B		C		D	E	F	G		H		I	J	K	L	M
		(Wholesale fixed network services)	(Wholesale mobile network services)	(Fixed Retail services)	(Mobile Retail services)				(Wholesale fixed network services)	(Wholesale mobile network services)	(Fixed Retail services)	(Mobile Retail services)					
1																	
2																	
3																	
4																	
5																	
5.1.	-																
5.2.	-																
6																	
7																	
8	/ (holding gain/loss or																
9	(-																
10																	

.313

.....
(,)

.....
(,)

.....
(,)

31
20 .

4.1.3. -			( ) .....		).....		20		..				
	A	()	(Wholesale fixed network services)	(Wholesale mobile network services)	(Fixed Retail services)	(Mobile Retail services)	(Wholesale fixed network services)	(Wholesale mobile network services)	(Fixed Retail services)	(Mobile Retail services)	K	L	M
			B	C	D	E	F	G	H	I			
1													
2													
2.1.	-												
2.2.	-												
2.3.													
3	(switch)												
4	(transmission)												
5													
6													
7													
8	/												
9	()												
9.1.	-												
9.2.	-												
10	()												
11													
11.1.	-												
11.2.	-												
12													
13													
14													
15													
16													

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(,)

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(,)

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(,)

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4.2.2. -

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A										J K L M N O P Q										R S T U V W X Y										Z AA AB AC AD AE AF										AG AH AI AJ AK AL										AM AN AO AP AQ AR AS										AT AU																																	
B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU																																																
										700,800,90										700,800,90										700,800,90										700,800,90																																																					
																																																				PSTN										PSTN										PSTN										PSTN											
																																																				ISDN 2B+D										ISDN 2B+D										ISDN 2B+D										ISDN 2B+D											
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																																																				xDSL ()										xDSL ()										xDSL ()										xDSL ()											
(SMS)																																																																																													
()																																																																																													
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4.2.3. -

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	A	B C		D	E F G H				I	J
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5.1.										
5.2. -										
6										
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8										
9										
10										
11										
11.1. (holding gain/loss -)										
11.2. (-)										
12										

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4.2.4. -

" " , .2, I 2 20()

	A	SMS, MMS				F	G	SMS, MMS				K	L	SMS, MMS				P	Q	SMS, MMS				U	V	W	
		B	C	D	E			H	I	J	M			N	O	R	S			T							
1	" "																										
2	" "																										
3																											
4																											
5																											
6																											
7																											
8																											
9	line (SMS; on-																										
10)																										
11																											
12	()																										
13																											
14																											
15	()																										

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4.2.5. -

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		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	
8	()																																			
9	/																																			
10	()																																			
10.1.	-																																			
10.2.	-																																			
11	()																																			
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12.1.	-																																			
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4.2.6. -

.1, I 2 20(") ,

	A								I	J
		B	C	D	E	F	G	H		
1	()									
2										
2.1.	GSM BST									
2.2.	UMTS Node B									
2.3.	GSM- BSC									
2.4.	UMTS- RNC									
2.5.	TCU									
2.6.	Repeater									
2.7.	NI									
2.7.1.										
2.7.2.										
2.8.	NOC									
2.9.	- OMC-R (Radio OMC)									
2.10.	MSC									
2.11.	SSW									
2.12.	SMSC									
2.13.	SGSN									
2.14.	SGGSN									
2.15.	STP									
2.16.	NOC									
2.17.	() - OMC-S (Switched OMC)									
2.18.	UMTS UMTS-OSS									
2.19.	a VMS									
2.20.	() HLR									
2.21.	(" ") VLR									
2.22.	EIR									
2.23.	AUC									
2.24.	IN Platforms									
2.25.	Provisioning system									
2.26.	Biling system									
2.27.	Mediation device									
2.28.	IT									
2.29.										
2.30.	- UMTS; GSM/UMTS; ;									
3										
4										
5										
6	()									
7	/									
8	()									
8.1.	-									
8.2.	-									
9	()									
10										
10.1.	-									
10.2.	-									
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4.2.7. -

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2.1.															
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10	()														
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4.2.8. -

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	4.2.8. -					"					"					.2, I 20 ., . .								
	A	B	C SMS,MMS	D	E	F	G	H SMS, MMS	I	J	K	L	M SMS,MMS	N	O	P	Q	R SMS, MMS	S	T	U	V	W	
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4.3.1. -

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%

%

	A	B	C	D	E	F	G	H	I	J	K
1											
2	2048 kbit/s										
3	2048 kbit/s										
4											
5											
6	/										
7											
8											
9											
10	DSLAM, backhaul										
11	, backhaul										
12	IP , backhaul										
13	PSTN										
14	ISDN (2B+D)										
15	ISDN (30B+D)										
16											
17											
18	" (, ")										
19											
20											

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4.3.2. -

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	(()			%			%
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1											
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11											
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4.3.3. - () " " - 20()..... . .

	()			()	%					%
	B	C	D	E	F	G	H	I	J	K
1										
1.1.										
1.2.										
2	" (, ")									
3	" (, ")									
4										
5										

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4.3.4. -

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№	()				()				%		
	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3	, (")										
4	, (")										
5											
6											

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4.3.6. -

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A		B	C	D	E	F	G	H	I	J
	SMS, MMS									
	SMS, MMS									
	SMS, MMS									
	SMS, MMS									

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4.4.1. -

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		B	C	D
A				
()				
1				
2	2048 kbit/s			
3	2048 kbit/s			
,				
4	2048 kbit/s			
5	2048 kbit/s			

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4.4.2. -

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A		B	C	D
1				
2				
2.1.	19" ,			
2.2.	19" ½ ,			
2.3.	19" ¼ ,			
2.4.	48V *			
2.5.	60V **			
3				
4				
5				
5.1.	½ ,			
5.2.	¼ ,			
6	/			
7				
8	,			

* 1-7 , .8

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VA	220	440	660	880	1100	1320	1540	1760	1980	2200	2420	2640	3080	3300	3520
½															
¼															

VA	220	440	660	880	1100	1320	1540	1760	1980	2200	2420	2640	3080	3300	3520
½															
¼															

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4.4.3. -

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A		B	C	D
1	1 .			
2	1 .			
3	1 ,			
4	1 ,			
5				
6				
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8	,			
9				

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4.4.4. -

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	A			
		B	C	D
1	;			
2				
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4				
5				
6				
7				
8	,			
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10	,			
11				
12				
13				
14				

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4.4.5. -

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		B	C	D
A		B	C	D
1	DSLAM			
2	(parent node)			
3	(distant node)			
4	IP (BRAS)			
5	DSLAM			
6	(parent node)			
7	(distant node)			
8	IP (BRAS)			

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4.4.6. -

"Retail minus" (

195/14.03.2013 .)

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A		()					
		B	C	D	E	F	G
1	/ PSTN						
1.1.	/ PSTN						
2	/ PSTN						
2.1.	/ PSTN						
3	/ ISDN (2B+D)						
3.1.	/ ISDN (2B+D)						
4	/ ISDN (2B+D)						
4.1.	/ ISDN (2B+D)						
5	/ ISDN (30B+D)						
5.1.	/ ISDN (30B+D)						
6	/ ISDN (30B+D)						
6.1.	/ ISDN (30B+D)						
7	PSTN						
7.1.	PSTN						
8	PSTN						
8.1.	PSTN						
9	ISDN (2B+D)						
9.1.	ISDN (2B+D)						
10	ISDN (2B+D)						
10.1.	ISDN (2B+D)						
11	ISDN (30B+D)						
11.1.	ISDN (30B+D)						
12	ISDN (30B+D)						
12.1.	ISDN (30B+D)						

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4.4.7. -

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"Retail minus" (195/14.03.2013 .)
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A		B	C	D	E	F	G
1							
1.1	(F2F on-net)						
1.2.	(F2F off-net);						
1.3.	(2F on-net);						
1.4.	(2F off-net);						
2	(WLR).						
2.1.							
2.2.	WIMAX						
2.3.	700XYZZZ, 800XYZZZ, 90XYTZZZ,						

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4.4.8. -

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	A	B	C	D	E	F
1	:					
1.2.	(Retail)					
1.2.1.	, (F2F on-net)					
1.2.2.	, (F2F off-net);					
1.2.3.	, (2F on-net)					
1.2.4.	, (2F off-net)					
1.2.5.	" "					

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4.4.9. -

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A		B	C	D	E	F
1						
1.1.	(2 on-net);					
1.2.	(2 off-net);					
1.3.	(F2M on-net);					
1.4.	(- F2M off-net);					
1.5.	(F2M off-net);					
2	;					
2.1.	(on-net);					
2.2.	(off-net)					
2.3.	(on-net)					
2.4.	() (off-net);					
2.5.	(off – net).					

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4.4.10. -

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	A			
		B	C	D
1	()			
1.1.				
1.2.				
2				
2.1.				
2.2.				

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4.5.1. -

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		B	C	D	E	F	G
**	PSTN (A)						
	ISDN 2B+D						
	ISDN 30B+D						
:							
	:						
	1.....						
	:						
	1.....						
	2.....						
	:						
	1.....						
	2.....						
:							
()	PSTN ()						
	ISDN 2B+D						
	ISDN 30B+D						
: ()							
	:						
	1.....						
	:						
	1.....						
	2.....						
	:						
	1.....						
	2.....						
: ()							
*)							
	" "						
	90 1. 700, 800,						
	xDSL ()						
: ()							

		B	C	D	E	F	
A		B	C	D	E	F	G
	:						
	1.....						
	" "						
	:						
	1.....						
	" "						
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	1.....						
	" "						
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	1.....						
	" "						
	:						
	1.....						
	: ()						

()	PSTN ()						
	ISDN 2B+D						
	ISDN 30B+D						
	: ()						

		B	C	D	E	F	
A		B	C	D	E	F	G
)	PSTN ()						
	ISDN 2B+D						
	ISDN 30B+D						
: (),							
)							
		700, 800,					
		xDSL ()					
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* 20.05.2011 .
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4.5.2. -

20().....

A	B	C	D	E	F	G
,	SMS,MMS					
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,	SMS,MMS					
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() ,	SMS,MMS					
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4.6.1. " 20()..... " " "

		e	e	
A		B	C	D
	PSTN			
	ISDN 2B+D			
	ISDN 30B+D			
	xDSL ()			
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	-			
	"			
	90 1. 700, 800,			
	xDSL ()			
	PSTN			
	ISDN 2B+D			
	ISDN 30B+D			
	xDSL ()			
	-			
	-			
	-			
	-			

4.6.1. " 20()..... " " "

		e	e	
A		B	C	D
90	1.	700, 800,		
	xDSL ()			

90	1.....			
	2.....			
	1.....			
	2.....			
	1.....			
	2.....			

90	1.	700, 800,		

4.6.1. " 20()..... " " "

		e	e	
A		B	C	D
	90 1. " 700, 800,			
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4.6.2. -

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	1.....					
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	1.....					
	2.....					
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	1.....					
	2.....					

	" "				
	1. 700, 800, 90				
	:				

	" "				
	1. 700, 800, 90				
	:				
	()				
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4.6.3.

20 "(" " " ").....

		e	e	
A		B	C	D
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: () ,				
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4.7.1. -

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4.7.2. -

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	31 20				/	(CCA)	
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1.1							
1.2							
1.3							
1.4							
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2.1							
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