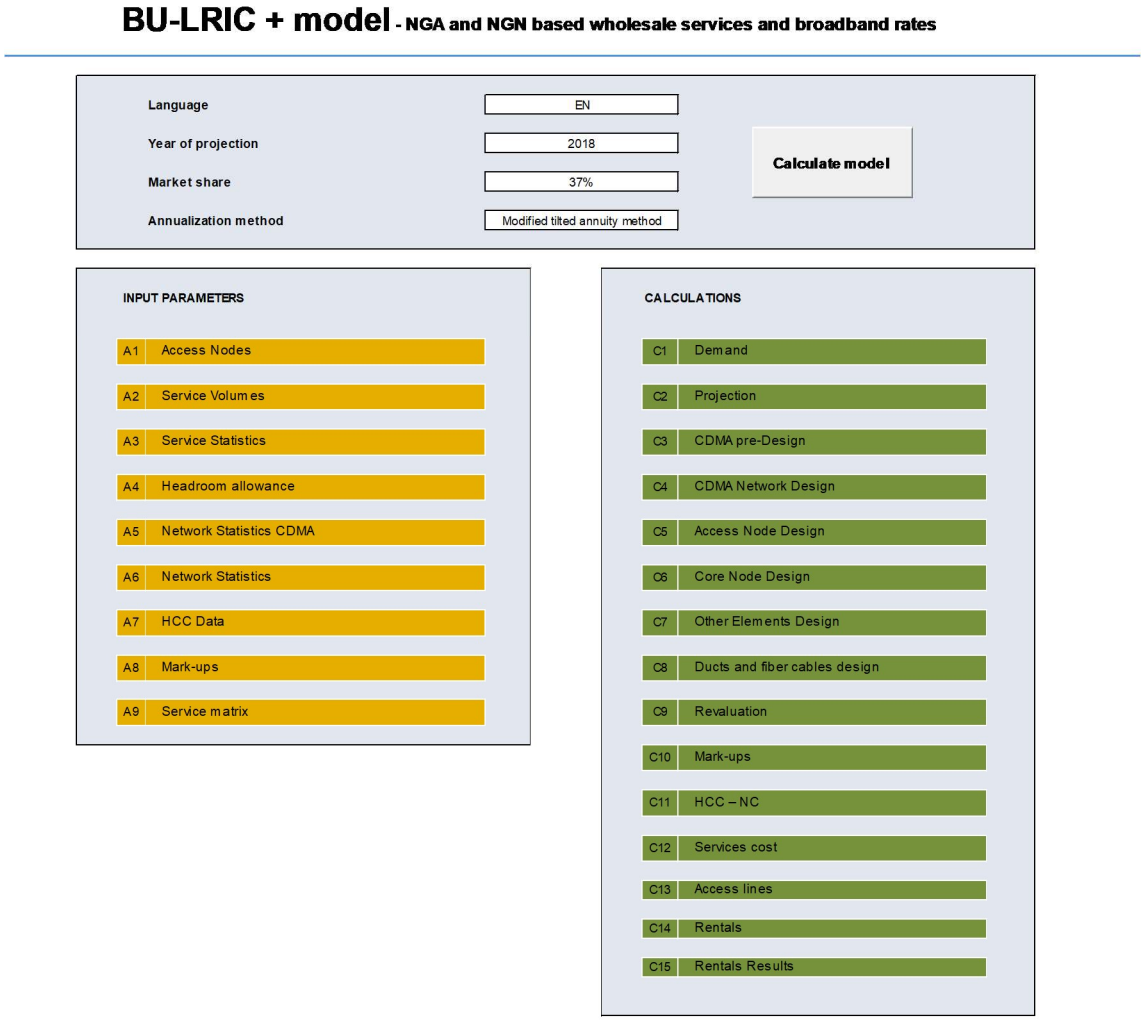
BU-LRIC+ model – NGA and NGN based wholesale services and broadband rates - Results

Contents

The purpose of this document is to present the model structure, parameters and results of calculation.

1. Model Menu


BU-LRIC + model - NGA and NGN based wholesale services and broadband rates
Language
EN
Year of projection
2018
Market share
37%
Annualization method
Modified tilted annuity method
Calculate model
INPUT PARAMETERS
A1 Access Nodes
A2 Service Volumes
A3 Service Statistics
A4 Headroom allowance
A5 Network Statistics CDMA
A6 Network Statistics
A7 HCC Data
A8 Mark-ups
A9 Service matrix
CALCULATIONS
C1 Demand
C2 Projection
C3 CDMA pre-Design
C4 CDMA Network Design
C5 Access Node Design
C6 Core Node Design
C7 Other Elements Design
C8 Ducts and fiber cables design
C9 Revaluation
C10 Mark-ups
C11 HCC – NC
C12 Services cost
C13 Access lines
C14 Rentals
C15 Rentals Results

2. *Input data*

Access Nodes - Structure

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number	Services volume												
					POTS	ISDN-BRA	ISDN-PRA	Internet access services - ADSL 2 Mbit/s with voice	Internet access services - ADSL 2 Mbit/s without voice	Internet access services - ADSL 4 Mbit/s with voice	Internet access services - ADSL 4 Mbit/s without voice	Internet access services - ADSL 8 Mbit/s with voice	Internet access services - ADSL 8 Mbit/s without voice	Internet access services - ADSL 10 Mbit/s with voice	Internet access services - ADSL 10 Mbit/s without voice	Internet access services - ADSL 16 Mbit/s with voice	Internet access services - ADSL 16 Mbit/s without voice
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Number	Access Node (AN) name	Internet access services - VDSL 20 Mbit/s with voice	Internet access services - VDSL 20 Mbit/s without voice	Internet access services - VDSL 30 Mbit/s with voice	Internet access services - VDSL 30 Mbit/s without voice	Internet access services - VDSL 40 Mbit/s with voice	Internet access services - VDSL 40 Mbit/s without voice	Internet access services - VDSL 50 Mbit/s with voice	Internet access services - VDSL 50 Mbit/s without voice	Internet access services - VDSL 60 Mbit/s with voice	Internet access services - VDSL 60 Mbit/s without voice	Internet access services - SHDSL 2 Mbit/s with voice	Internet access services - SHDSL 2 Mbit/s without voice	Internet access services - SHDSL 4 Mbit/s with voice	Internet access services - SHDSL 4 Mbit/s without voice	Internet access services - SHDSL 8 Mbit/s with voice	Internet access services - SHDSL 8 Mbit/s without voice	Internet access services - SHDSL 10 Mbit/s with voice	Internet access services - SHDSL 10 Mbit/s without voice	Internet access services - SHDSL 16 Mbit/s with voice	Internet access services - SHDSL 16 Mbit/s without voice
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

Number	Access Node (AN) name	Internet access services - GPON 50 Mbit/s without voice	Internet access services - GPON 50 Mbit/s with voice	Internet access services - GPON 75 Mbit/s without voice	Internet access services - GPON 75 Mbit/s with voice	Internet access services - GPON 100 Mbit/s without voice	Internet access services - GPON 100 Mbit/s with voice	Internet access services - P2P 50 Mbit/s without voice	Internet access services - P2P 50 Mbit/s with voice	Internet access services - P2P 75 Mbit/s without voice	Internet access services - P2P 75 Mbit/s with voice	Internet access services - P2P 100 Mbit/s without voice	Internet access services - P2P 100 Mbit/s with voice	Digital television
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

Number	Access Node (AN) name	Services presence												
		TDM leased lines up to 2Mbit/s	TDM leased lines 34 Mbit/s	TDM leased lines STM-1	TDM leased lines STM-4	Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

Access Nodes - Inputs

Number of access nodes per geotype	Access Node (AN) name	Geotype (urban, suburban, rural)	Services volume												
			POTS	ISDN-BRA	ISDN-PRA	Internet access services - ADSL 2 Mbit/s with voice	Internet access services - ADSL 2 Mbit/s without voice	Internet access services - ADSL 4 Mbit/s with voice	Internet access services - ADSL 4 Mbit/s without voice	Internet access services - ADSL 8 Mbit/s with voice	Internet access services - ADSL 8 Mbit/s without voice	Internet access services - ADSL 10 Mbit/s with voice	Internet access services - ADSL 10 Mbit/s without voice	Internet access services - ADSL 16 Mbit/s with voice	Internet access services - ADSL 16 Mbit/s without voice
368		urban	603 905	0	185	10 007	7 365	2 099	46 812	2 337	777	0	0	4	0
102		rural	13 900	0	0	31	556	368	6 734	231	50	0	0	0	0

Number of access nodes per geotype	Access Node (AN) name	Geotype (urban, suburban, rural)	Internet access services - VDSL 20 Mbit/s with voice	Internet access services - VDSL 20 Mbit/s without voice	Internet access services - VDSL 30 Mbit/s with voice	Internet access services - VDSL 30 Mbit/s without voice	Internet access services - VDSL 40 Mbit/s with voice	Internet access services - VDSL 40 Mbit/s without voice	Internet access services - VDSL 50 Mbit/s with voice	Internet access services - VDSL 50 Mbit/s without voice	Internet access services - VDSL 60 Mbit/s with voice	Internet access services - VDSL 60 Mbit/s without voice	Internet access services - SHDSL 2 Mbit/s with voice	Internet access services - SHDSL 2 Mbit/s without voice	Internet access services - SHDSL 4 Mbit/s with voice	Internet access services - SHDSL 4 Mbit/s without voice	Internet access services - SHDSL 8 Mbit/s with voice	Internet access services - SHDSL 8 Mbit/s without voice	Internet access services - SHDSL 10 Mbit/s with voice	Internet access services - SHDSL 10 Mbit/s without voice	Internet access services - SHDSL 16 Mbit/s with voice	Internet access services - SHDSL 16 Mbit/s without voice
368		urban	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102		rural	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Number of access nodes per geotype	Access Node (AN) name	Geotype (urban, suburban, rural)	Internet access services - GPON 50 Mbit/s without voice	Internet access services - GPON 50 Mbit/s with voice	Internet access services - GPON 75 Mbit/s without voice	Internet access services - GPON 75 Mbit/s with voice	Internet access services - GPON 100 Mbit/s without voice	Internet access services - GPON 100 Mbit/s with voice	Internet access services - P2P 50 Mbit/s without voice	Internet access services - P2P 50 Mbit/s with voice	Internet access services - P2P 75 Mbit/s without voice	Internet access services - P2P 75 Mbit/s with voice	Internet access services - P2P 100 Mbit/s without voice	Internet access services - P2P 100 Mbit/s with voice	Digital television
368		urban	456 079	79	16	0	2 848	0	32 938	0	36	0	416	0	388 514
102		rural	42 078	0	1	0	40	0	11	0	0	0	7	0	33 687

Service Volumes – Structure

Data Type	Unit		Year						
			2017	2018	2019	2020	2021	2022	2023
Number of services									
Voice services - fixed network									
Year end POTS services	services	6	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Year end ISDN - BRA services	services	7	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Year end ISDN - PRA services	services	8	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Voice services - CDMA network									
Year end voice services	services	10	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - fixed network									
Internet access services - ADSL 2 Mbit/s with voice	services	12	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 2 Mbit/s without voice	services	13	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 4 Mbit/s with voice	services	14	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 4 Mbit/s without voice	services	15	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 8 Mbit/s with voice	services	16	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 8 Mbit/s without voice	services	17	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 10 Mbit/s with voice	services	18	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 10 Mbit/s without voice	services	19	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 16 Mbit/s with voice	services	20	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - ADSL 16 Mbit/s without voice	services	21	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 20 Mbit/s with voice	services	22	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 20 Mbit/s without voice	services	23	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 30 Mbit/s with voice	services	24	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 30 Mbit/s without voice	services	25	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 40 Mbit/s with voice	services	26	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 40 Mbit/s without voice	services	27	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 50 Mbit/s with voice	services	28	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 50 Mbit/s without voice	services	29	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 60 Mbit/s with voice	services	30	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - VDSL 60 Mbit/s without voice	services	31	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 2 Mbit/s with voice	services	32	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 2 Mbit/s without voice	services	33	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 4 Mbit/s with voice	services	34	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 4 Mbit/s without voice	services	35	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 8 Mbit/s with voice	services	36	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 8 Mbit/s without voice	services	37	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 10 Mbit/s with voice	services	38	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 10 Mbit/s without voice	services	39	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 16 Mbit/s with voice	services	40	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - SHDSL 16 Mbit/s without voice	services	41	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - GPON 50 Mbit/s without voice	services	42	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - GPON 50 Mbit/s with voice	services	43	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - GPON 75 Mbit/s without voice	services	44	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - GPON 75 Mbit/s with voice	services	45	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - GPON 100 Mbit/s without voice	services	46	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - GPON 100 Mbit/s with voice	services	47	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - P2P 50 Mbit/s without voice	services	48	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - P2P 50 Mbit/s with voice	services	49	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - P2P 75 Mbit/s without voice	services	50	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - P2P 75 Mbit/s with voice	services	51	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - P2P 100 Mbit/s without voice	services	52	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Internet access services - P2P 100 Mbit/s with voice	services	53	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Data Type	Unit		Year						
			2017	2018	2019	2020	2021	2022	2023
Number of services									
Internet access services - CDMA network									
Internet access services - CDMA	services	55	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TV services									
Year end digital television (DTV) services	services	57	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines national (both ends in Georgia)									
TDM leased lines up to 2Mbit/s	services	59	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines 34 Mbit/s	services	60	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines STM-1	services	61	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines STM-4	services	62	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines international (one end in Georgia)									
TDM leased lines up to 2Mbit/s	services	64	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines 34 Mbit/s	services	65	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines STM-1	services	66	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TDM leased lines STM-4	services	67	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission end to end national (both ends in Georgia)									
Data transmission 2 Mbit/s	services	69	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Mbit/s	services	70	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 100 Mbit/s	services	71	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 200 Mbit/s	services	72	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 500 Mbit/s	services	73	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 1 Gbit/s	services	74	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 2 Gbit/s	services	75	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 5 Gbit/s	services	76	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Gbit/s	services	77	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission end to end international (one end in Georgia)									
Data transmission 2 Mbit/s	services	79	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Mbit/s	services	80	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 100 Mbit/s	services	81	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 200 Mbit/s	services	82	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 500 Mbit/s	services	83	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 1 Gbit/s	services	84	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 2 Gbit/s	services	85	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 5 Gbit/s	services	86	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Gbit/s	services	87	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission local (only access network - from subscriber premises to AN)									
Data transmission 2 Mbit/s	services	89	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Mbit/s	services	90	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 100 Mbit/s	services	91	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 200 Mbit/s	services	92	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 500 Mbit/s	services	93	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 1 Gbit/s	services	94	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 2 Gbit/s	services	95	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 5 Gbit/s	services	96	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Gbit/s	services	97	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission backhaul (from AN to LN)									
Data transmission 2 Mbit/s	services	99	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Mbit/s	services	100	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 100 Mbit/s	services	101	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 200 Mbit/s	services	102	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 500 Mbit/s	services	103	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 1 Gbit/s	services	104	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 2 Gbit/s	services	105	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 5 Gbit/s	services	106	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Gbit/s	services	107	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission trunk (from LN to TN and between TN)									
Data transmission 2 Mbit/s	services	109	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Mbit/s	services	110	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 100 Mbit/s	services	111	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 200 Mbit/s	services	112	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 500 Mbit/s	services	113	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 1 Gbit/s	services	114	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 2 Gbit/s	services	115	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 5 Gbit/s	services	116	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Data transmission 10 Gbit/s	services	117	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Data Type	Unit		Year						
			2017	2018	2019	2020	2021	2022	2023
Voice traffic - fixed network									
On-net calls	minutes	121	0	0	0	0	0	0	0
Interconnection calls – outgoing on local level	minutes	122	0	0	0	0	0	0	0
Interconnection calls – outgoing on transit level	minutes	123	0	0	0	0	0	0	0
Interconnection calls – incoming on local level	minutes	124	0	0	0	0	0	0	0
Interconnection calls – incoming on transit level	minutes	125	0	0	0	0	0	0	0
Interconnection calls – transit on local level	minutes	126	0	0	0	0	0	0	0
Interconnection calls – international outgoing calls	minutes	127	0	0	0	0	0	0	0
Interconnection calls – international incoming calls	minutes	128	0	0	0	0	0	0	0
Other voice service	minutes	129	0	0	0	0	0	0	0
Packet data traffic - fixed network									
Annual traffic - Internet access services	Gbytes	133	0	0	0	0	0	0	0
Annual traffic - DTV services	Gbytes	134	0	0	0	0	0	0	0
Annual traffic - TDM leased lines national	Gbytes	135	0	0	0	0	0	0	0
Annual traffic - TDM leased lines international	Gbytes	136	0	0	0	0	0	0	0
Annual traffic - Data transmission end to end national	Gbytes	137	0	0	0	0	0	0	0
Annual traffic - Data transmission end to end international	Gbytes	138	0	0	0	0	0	0	0
Annual traffic - Data transmission local	Gbytes	139	0	0	0	0	0	0	0
Annual traffic - Data transmission backhaul	Gbytes	140	0	0	0	0	0	0	0
Annual traffic - Data transmission trunk	Gbytes	141	0	0	0	0	0	0	0
Voice and data traffic - CDMA									
On-net calls	minutes	145	0	0	0	0	0	0	0
Interconnection calls – outgoing on local level	minutes	146	0	0	0	0	0	0	0
Interconnection calls – incoming on transit level	minutes	147	0	0	0	0	0	0	0
Annual traffic - Internet access services	Gbytes	149	0	0	0	0	0	0	0

Service Statistics – Structure

	Access Node (AN)	Local Node (LN)	Transit Node (TN)	Transmission - AN -	Transmission - LN -	Transmission - LN -	Transmission - LN -	Transmission - TN -	Transmission - TN -	MGW	IMS	Softswitch	Billing system	AAA server	BRAS
Routing matrix (voice services)															
On-net calls															
Interconnection calls – outgoing on local level															
Interconnection calls – outgoing on transit level															
Interconnection calls – incoming on local level															
Interconnection calls – incoming on transit level															
Interconnection calls – transit on local level															
Interconnection calls – international outgoing calls															
Interconnection calls – international incoming calls															
Other voice service															
Routing matrix (data services)															
Internet access services															
DTV services															
TDM leased lines national															
TDM leased lines international															
Data transmission end to end national															
Data transmission end to end international															
Data transmission local															
Data transmission backhaul															
Data transmission trunk															

Priority factors		
Voice services - fixed network	%	
Internet access services	%	
DTV services	%	
TDM leased lines national	%	
TDM leased lines international	%	
Data transmission end to end national	%	
Data transmission end to end international	%	
Data transmission local	%	
Data transmission backhaul	%	
Data transmission trunk	%	

Busy Hour to Average Hour traffic ratio		Access Node (AN)	Local Node (LN)	Transit Node (TN)
Voice services	%			
Internet access services	%			
DTV services	%			
TDM leased lines national	%			
TDM leased lines international	%			
Data transmission end to end national	%			
Data transmission end to end international	%			
Data transmission local	%			
Data transmission backhaul	%			
Data transmission trunk	%			

VoIP assumptions		
VoIP codec		G.711 (64 Kbp
IP header	bytes	20,00
UDP header	bytes	8,00
RTP header	bytes	12,00
Ethernet header	bytes	18,00
Codec bit rate	Kbit/s	64,00
Voice Payload Size	bytes	160,00
Packets per second	packets	50,00
VoIP channel bit rate	Kbit/s	0,00

Voice services parameters		
Percentage of unsuccessful calls to total calls	%	
Successful call - average lenght	minutes	0,00
Call set-up duration for successful calls	minutes	
Call set-up duration for unsuccessful calls	minutes	
Call duration	minutes	
Equivalent voice channels - POTS	voice channels	1
Equivalent voice channels ISDN-BRA	voice channels	2
Equivalent voice channels ISDN-PRA	voice channels	30

Internet access services statistics			
Subscribers			
Internet access services - ADSL 2 Mbit/s w ith voice	subscribers	2	0
Internet access services - ADSL 2 Mbit/s w ithout voice	subscribers	2	0
Internet access services - ADSL 4 Mbit/s w ith voice	subscribers	4	0
Internet access services - ADSL 4 Mbit/s w ithout voice	subscribers	4	0
Internet access services - ADSL 8 Mbit/s w ith voice	subscribers	8	0
Internet access services - ADSL 8 Mbit/s w ithout voice	subscribers	8	0
Internet access services - ADSL 10 Mbit/s w ith voice	subscribers	10	0
Internet access services - ADSL 10 Mbit/s w ithout voice	subscribers	10	0
Internet access services - ADSL 16 Mbit/s w ith voice	subscribers	16	0
Internet access services - ADSL 16 Mbit/s w ithout voice	subscribers	16	0
Internet access services - VDSL 20 Mbit/s w ith voice	subscribers	20	0
Internet access services - VDSL 20 Mbit/s w ithout voice	subscribers	20	0
Internet access services - VDSL 30 Mbit/s w ith voice	subscribers	30	0
Internet access services - VDSL 30 Mbit/s w ithout voice	subscribers	30	0
Internet access services - VDSL 40 Mbit/s w ith voice	subscribers	40	0
Internet access services - VDSL 40 Mbit/s w ithout voice	subscribers	40	0
Internet access services - VDSL 50 Mbit/s w ith voice	subscribers	50	0
Internet access services - VDSL 50 Mbit/s w ithout voice	subscribers	50	0
Internet access services - VDSL 60 Mbit/s w ith voice	subscribers	60	0
Internet access services - VDSL 60 Mbit/s w ithout voice	subscribers	60	0
Internet access services - SHDSL 2 Mbit/s w ith voice	subscribers	2	0
Internet access services - SHDSL 2 Mbit/s w ithout voice	subscribers	2	0
Internet access services - SHDSL 4 Mbit/s w ith voice	subscribers	4	0
Internet access services - SHDSL 4 Mbit/s w ithout voice	subscribers	4	0
Internet access services - SHDSL 8 Mbit/s w ith voice	subscribers	8	0
Internet access services - SHDSL 8 Mbit/s w ithout voice	subscribers	8	0
Internet access services - SHDSL 10 Mbit/s w ith voice	subscribers	10	0
Internet access services - SHDSL 10 Mbit/s w ithout voice	subscribers	10	0
Internet access services - SHDSL 16 Mbit/s w ith voice	subscribers	16	0
Internet access services - SHDSL 16 Mbit/s w ithout voice	subscribers	16	0
Internet access services - GPON 50 Mbit/s w ithout voice	subscribers	50	0
Internet access services - GPON 50 Mbit/s w ith voice	subscribers	50	0
Internet access services - GPON 75 Mbit/s w ithout voice	subscribers	75	0
Internet access services - GPON 75 Mbit/s w ith voice	subscribers	75	0
Internet access services - GPON 100 Mbit/s w ithout voice	subscribers	100	0
Internet access services - GPON 100 Mbit/s w ith voice	subscribers	100	0
Internet access services - P2P 50 Mbit/s w ithout voice	subscribers	50	0
Internet access services - P2P 50 Mbit/s w ith voice	subscribers	50	0
Internet access services - P2P 75 Mbit/s w ithout voice	subscribers	75	0
Internet access services - P2P 75 Mbit/s w ith voice	subscribers	75	0
Internet access services - P2P 100 Mbit/s w ithout voice	subscribers	100	0
Internet access services - P2P 100 Mbit/s w ith voice	subscribers	100	0
DTV services	subscribers		0

Average throughputs		
Internet access services - ADSL 2 Mbit/s with voice	Kbit/s	0,00
Internet access services - ADSL 2 Mbit/s without voice	Kbit/s	0,00
Internet access services - ADSL 4 Mbit/s with voice	Kbit/s	0,00
Internet access services - ADSL 4 Mbit/s without voice	Kbit/s	0,00
Internet access services - ADSL 8 Mbit/s with voice	Kbit/s	0,00
Internet access services - ADSL 8 Mbit/s without voice	Kbit/s	0,00
Internet access services - ADSL 10 Mbit/s with voice	Kbit/s	0,00
Internet access services - ADSL 10 Mbit/s without voice	Kbit/s	0,00
Internet access services - ADSL 16 Mbit/s with voice	Kbit/s	0,00
Internet access services - ADSL 16 Mbit/s without voice	Kbit/s	0,00
Internet access services - VDSL 20 Mbit/s with voice	Kbit/s	0,00
Internet access services - VDSL 20 Mbit/s without voice	Kbit/s	0,00
Internet access services - VDSL 30 Mbit/s with voice	Kbit/s	0,00
Internet access services - VDSL 30 Mbit/s without voice	Kbit/s	0,00
Internet access services - VDSL 40 Mbit/s with voice	Kbit/s	0,00
Internet access services - VDSL 40 Mbit/s without voice	Kbit/s	0,00
Internet access services - VDSL 50 Mbit/s with voice	Kbit/s	0,00
Internet access services - VDSL 50 Mbit/s without voice	Kbit/s	0,00
Internet access services - VDSL 60 Mbit/s with voice	Kbit/s	0,00
Internet access services - VDSL 60 Mbit/s without voice	Kbit/s	0,00
Internet access services - SHDSL 2 Mbit/s with voice	Kbit/s	0,00
Internet access services - SHDSL 2 Mbit/s without voice	Kbit/s	0,00
Internet access services - SHDSL 4 Mbit/s with voice	Kbit/s	0,00
Internet access services - SHDSL 4 Mbit/s without voice	Kbit/s	0,00
Internet access services - SHDSL 8 Mbit/s with voice	Kbit/s	0,00
Internet access services - SHDSL 8 Mbit/s without voice	Kbit/s	0,00
Internet access services - SHDSL 10 Mbit/s with voice	Kbit/s	0,00
Internet access services - SHDSL 10 Mbit/s without voice	Kbit/s	0,00
Internet access services - SHDSL 16 Mbit/s with voice	Kbit/s	0,00
Internet access services - SHDSL 16 Mbit/s without voice	Kbit/s	0,00
Internet access services - GPON 50 Mbit/s without voice	Kbit/s	0,00
Internet access services - GPON 50 Mbit/s with voice	Kbit/s	0,00
Internet access services - GPON 75 Mbit/s without voice	Kbit/s	0,00
Internet access services - GPON 75 Mbit/s with voice	Kbit/s	0,00
Internet access services - GPON 100 Mbit/s without voice	Kbit/s	0,00
Internet access services - GPON 100 Mbit/s with voice	Kbit/s	0,00
Internet access services - P2P 50 Mbit/s without voice	Kbit/s	0,00
Internet access services - P2P 50 Mbit/s with voice	Kbit/s	0,00
Internet access services - P2P 75 Mbit/s without voice	Kbit/s	0,00
Internet access services - P2P 75 Mbit/s with voice	Kbit/s	0,00
Internet access services - P2P 100 Mbit/s without voice	Kbit/s	0,00
Internet access services - P2P 100 Mbit/s with voice	Kbit/s	0,00
DTV services	Kbit/s	0,00

Data - Points of interconnection (POI)		
The total bandwidth of the data at POI		
MSAN level	%	
Ethernet level	%	
IP level	%	

Parameters of POI interfaces		
Capacity of STM-1	E1	
Capacity of STM-4	E1	

Voice - Points of interconnection (POI)		
Points of interconnection - Local Nodes		
Ports volume		
E1 interfaces	ports	
STM-1 interfaces	ports	
STM-4 interfaces	ports	
Equivalent E1 ports volume		
E1 interfaces	E1	0
STM-1 interfaces	E1	0
STM-4 interfaces	E1	0
Distribution - E1 ports		
E1 interfaces	%	#DIV/0!
STM-1 interfaces	%	#DIV/0!
STM-4 interfaces	%	#DIV/0!
Points of interconnection - Transit Nodes		
E1 interfaces	ports	
STM-1 interfaces	ports	
STM-4 interfaces	ports	
Equivalent E1 ports volume		
E1 interfaces	E1	0
STM-1 interfaces	E1	0
STM-4 interfaces	E1	0
Distribution - E1 ports		
E1 interfaces	%	#DIV/0!
STM-1 interfaces	%	#DIV/0!
STM-4 interfaces	%	#DIV/0!

Leased lines average throughputs			
Subscribers			
TDM leased lines national (both ends in Georgia)			
TDM leased lines up to 2Mbit/s	subscribers	2	0
TDM leased lines 34 Mbit/s	subscribers	34	0
TDM leased lines STM-1	subscribers	155	0
TDM leased lines STM-4	subscribers	625	0
TDM leased lines international (one end in Georgia)			
TDM leased lines up to 2Mbit/s	subscribers	2	0
TDM leased lines 34 Mbit/s	subscribers	34	0
TDM leased lines STM-1	subscribers	155	0
TDM leased lines STM-4	subscribers	625	0
Average throughputs			
TDM leased lines national (both ends in Georgia)			
TDM leased lines up to 2Mbit/s	Kbit/s		0,00
TDM leased lines 34 Mbit/s	Kbit/s		0,00
TDM leased lines STM-1	Kbit/s		0,00
TDM leased lines STM-4	Kbit/s		0,00
TDM leased lines international (one end in Georgia)			
TDM leased lines up to 2Mbit/s	Kbit/s		0,00
TDM leased lines 34 Mbit/s	Kbit/s		0,00
TDM leased lines STM-1	Kbit/s		0,00
TDM leased lines STM-4	Kbit/s		0,00

Data transmission services average throughputs			
Subscribers			
Data transmission end to end national (both ends in Georgia)			
Data transmission 2 Mbit/s	subscribers	2	0,0
Data transmission 10 Mbit/s	subscribers	10	0,0
Data transmission 100 Mbit/s	subscribers	100	0,0
Data transmission 200 Mbit/s	subscribers	200	0,0
Data transmission 500 Mbit/s	subscribers	500	0,0
Data transmission 1 Gbit/s	subscribers	1000	0,0
Data transmission 2 Gbit/s	subscribers	2000	0,0
Data transmission 5 Gbit/s	subscribers	5000	0,0
Data transmission 10 Gbit/s	subscribers	10000	0,0
Data transmission end to end international (one end in Georgia)			
Data transmission 2 Mbit/s	subscribers	2	0,00
Data transmission 10 Mbit/s	subscribers	10	0,00
Data transmission 100 Mbit/s	subscribers	100	0,00
Data transmission 200 Mbit/s	subscribers	200	0,00
Data transmission 500 Mbit/s	subscribers	500	0,00
Data transmission 1 Gbit/s	subscribers	1000	0,00
Data transmission 2 Gbit/s	subscribers	2000	0,00
Data transmission 5 Gbit/s	subscribers	5000	0,00
Data transmission 10 Gbit/s	subscribers	10000	0,00
Data transmission local (only access network - from subscriber premises to AN)			
Data transmission 2 Mbit/s	subscribers	2	0,0000
Data transmission 10 Mbit/s	subscribers	10	0,0000
Data transmission 100 Mbit/s	subscribers	100	0,0000
Data transmission 200 Mbit/s	subscribers	200	0,0000
Data transmission 500 Mbit/s	subscribers	500	0,0000
Data transmission 1 Gbit/s	subscribers	1000	0,0000
Data transmission 2 Gbit/s	subscribers	2000	0,0000
Data transmission 5 Gbit/s	subscribers	5000	0,0000
Data transmission 10 Gbit/s	subscribers	10000	0,0000
Data transmission backhaul (from AN to LN)			
Data transmission 2 Mbit/s	subscribers	2	0,0000
Data transmission 10 Mbit/s	subscribers	10	0,0000
Data transmission 100 Mbit/s	subscribers	100	0,0000
Data transmission 200 Mbit/s	subscribers	200	0,0000
Data transmission 500 Mbit/s	subscribers	500	0,0000
Data transmission 1 Gbit/s	subscribers	1000	0,0000
Data transmission 2 Gbit/s	subscribers	2000	0,0000
Data transmission 5 Gbit/s	subscribers	5000	0,0000
Data transmission 10 Gbit/s	subscribers	10000	0,0000
Data transmission trunk (from LN to TN and between TN)			
Data transmission 2 Mbit/s	subscribers	2	0
Data transmission 10 Mbit/s	subscribers	10	0
Data transmission 100 Mbit/s	subscribers	100	0
Data transmission 200 Mbit/s	subscribers	200	0
Data transmission 500 Mbit/s	subscribers	500	0
Data transmission 1 Gbit/s	subscribers	1000	0
Data transmission 2 Gbit/s	subscribers	2000	0
Data transmission 5 Gbit/s	subscribers	5000	0
Data transmission 10 Gbit/s	subscribers	10000	0

Data transmission services average throughputs		
Average throughputs		
Data transmission end to end national (both ends in Georgia)		
Data transmission 2 Mbit/s	Kbit/s	0,00
Data transmission 10 Mbit/s	Kbit/s	0,00
Data transmission 100 Mbit/s	Kbit/s	0,00
Data transmission 200 Mbit/s	Kbit/s	0,00
Data transmission 500 Mbit/s	Kbit/s	0,00
Data transmission 1 Gbit/s	Kbit/s	0,00
Data transmission 2 Gbit/s	Kbit/s	0,00
Data transmission 5 Gbit/s	Kbit/s	0,00
Data transmission 10 Gbit/s	Kbit/s	0,00
Data transmission end to end international (one end in Georgia)		
Data transmission 2 Mbit/s	Kbit/s	0,00
Data transmission 10 Mbit/s	Kbit/s	0,00
Data transmission 100 Mbit/s	Kbit/s	0,00
Data transmission 200 Mbit/s	Kbit/s	0,00
Data transmission 500 Mbit/s	Kbit/s	0,00
Data transmission 1 Gbit/s	Kbit/s	0,00
Data transmission 2 Gbit/s	Kbit/s	0,00
Data transmission 5 Gbit/s	Kbit/s	0,00
Data transmission 10 Gbit/s	Kbit/s	0,00
Data transmission local (only access network - from subscriber premises to AN)		
Data transmission 2 Mbit/s	Kbit/s	0,00
Data transmission 10 Mbit/s	Kbit/s	0,00
Data transmission 100 Mbit/s	Kbit/s	0,00
Data transmission 200 Mbit/s	Kbit/s	0,00
Data transmission 500 Mbit/s	Kbit/s	0,00
Data transmission 1 Gbit/s	Kbit/s	0,00
Data transmission 2 Gbit/s	Kbit/s	0,00
Data transmission 5 Gbit/s	Kbit/s	0,00
Data transmission 10 Gbit/s	Kbit/s	0,00
Data transmission backhaul (from AN to LN)		
Data transmission 2 Mbit/s	Kbit/s	0,00
Data transmission 10 Mbit/s	Kbit/s	0,00
Data transmission 100 Mbit/s	Kbit/s	0,00
Data transmission 200 Mbit/s	Kbit/s	0,00
Data transmission 500 Mbit/s	Kbit/s	0,00
Data transmission 1 Gbit/s	Kbit/s	0,00
Data transmission 2 Gbit/s	Kbit/s	0,00
Data transmission 5 Gbit/s	Kbit/s	0,00
Data transmission 10 Gbit/s	Kbit/s	0,00
Data transmission trunk (from LN to TN and between TN)		
Data transmission 2 Mbit/s	Kbit/s	0,00
Data transmission 10 Mbit/s	Kbit/s	0,00
Data transmission 100 Mbit/s	Kbit/s	0,00
Data transmission 200 Mbit/s	Kbit/s	0,00
Data transmission 500 Mbit/s	Kbit/s	0,00
Data transmission 1 Gbit/s	Kbit/s	0,00
Data transmission 2 Gbit/s	Kbit/s	0,00
Data transmission 5 Gbit/s	Kbit/s	0,00
Data transmission 10 Gbit/s	Kbit/s	0,00

			BTS	BSC	MSC/MGW	BTS-BSC	BSC-MSC	MSC-MSC	MSC-IC
Routing matrix (voice services) - CDMA									
On-net calls			2,00	2,00	1,00	2,00	2,00	0,00	0,00
Interconnection calls – outgoing on transit level			1,00	1,00	1,00	1,00	1,00	0,00	1,00
Interconnection calls – incoming on transit level			1,00	1,00	1,00	1,00	1,00	0,00	1,00
Routing matrix (data services) - CDMA									
Internet access services			1,00	1,00	1,00	1,00	1,00	0,00	0,00
Voice services parameters									
Call set-up duration for successful calls	minutes	0,00							
Call set-up duration for unsuccessful calls	minutes	0,00							
Call duration	minutes	0,00							
Percentage of unsuccessful calls to total calls	%	0%							
Busy Hour to Average Hour traffic ratio - Voice services		0%							
Busy Hour to Average Hour traffic ratio - Internet access services		0%							
Data conversion factors									
CDMA 1xRTT Bit rate [kbit/s]		153,00							
EVDO Bit rate [kbit/s]		3 072,00							
CDMA 1xRTT channel elements		1,00							
EVDO channel elements		1,00							
CDMA data traffic in CDMA network		18%							
EVDO data traffic in CDMA network		82%							
Voice call bitrate in [kbps]		9,60							

Headroom allowance - Structure

Network element type	Unit	Design utilisation factor at planning stage	Planning horizon	Network demand group
MDF	%			
ODF	%			
MSAN - subscriber card - data services	%			
MSAN - subscriber card - voice services	%			
MSAN - voice processing elements	%			
MSAN - trunking cards	%			
OLT - subscriber card - data services	%			
OLT - trunking cards	%			
Ethernet switch - trunking cards	%			
Ethernet switch - switching cards	%			
IP router - trunking cards	%			
IP router - switching cards	%			
Media Gateway (MGW) - switching cards	%			
Media Gateway (MGW) - trunking cards	%			
IMS - voice processing elements	%			
IMS - subscriber serving elements	%			
Softswitch	%			
Billing hardware and software	%			
AAA server	%			
BRAS	%			
BTS - Macrocell equipment	%			
BTS - Microcell equipment	%			
BSC	%			
MSC Server	%			
MGW trunk port	%			
MGW processor	%			
Ethernet radiolink 20 Mb/s microwave link	%			
HLR	%			

Headroom allowance - Inputs

Network element type	Unit	Design utilisation factor at planning stage	Planning horizon	Network demand group
MDF	%			Subscribers - voice services
ODF	%			Subscribers - Internet access services
MSAN - subscriber card - data services	%			Subscribers - Internet access services
MSAN - subscriber card - voice services	%			Subscribers - voice services
MSAN - voice processing elements	%			Voice traffic
MSAN - trunking cards	%			Voice and data traffic
OLT - subscriber card - data services	%			Subscribers - Internet access services
OLT - trunking cards	%			Voice and data traffic
Ethernet switch - trunking cards	%			Voice and data traffic
Ethernet switch - switching cards	%			Voice and data traffic
IP router - trunking cards	%			Voice and data traffic
IP router - switching cards	%			Voice and data traffic
Media Gateway (MGW) - switching cards	%			Voice traffic
Media Gateway (MGW) - trunking cards	%			Voice traffic
IMS - voice processing elements	%			Voice traffic
IMS - subscriber serving elements	%			Subscribers - voice services
Softswitch	%			Voice traffic
Billing hardware and software	%			Voice traffic
AAA server	%			Subscribers - Internet access services
BRAS	%			Subscribers - Internet access services
BTS - Macrocell equipment	%			Voice and data traffic
BTS - Microcell equipment	%			Voice and data traffic
BSC	%			Voice and data traffic
MSC Server	%			Voice and data traffic
MGW trunk port	%			Voice and data traffic
MGW processor	%			Voice and data traffic
Ethernet radiolink 20 Mb/s microwave link	%			Voice and data traffic
HLR	%			Voice and data traffic

Network statistics CDMA – Structure/Inputs

Data Type	Unit	Value
Coverage parameters		
Total area covered	km2	49 142
Proportion of urban area	%	0,58%
Proportion of suburban area	%	0,82%
Proportion of rural area	%	98,60%
CDMA coverage		
urban area	%	100%
suburban area	%	100%
rural area	%	100%
EVDO presence in CDMA network		
urban area	1/0	1
suburban area	1/0	1
rural area	1/0	1
CDMA traffic		
Total CDMA traffic		
Voice and video traffic	Erl	**0**
Packet data traffic	BH MB	**0**
UL / DL Ratio	%	**0%**
Geographical CDMA traffic mapping		**100%**
urban area		8%
suburban area		14%
rural area		78%
Proportion of urban CDMA voice traffic serviced by different cell types		**100%**
Proportion of urban traffic serviced by macrocells		100%
Proportion of urban traffic serviced by microcells		0%
Proportion of urban traffic serviced by picocells		0%
Proportion of suburban CDMA voice traffic serviced by different cell types		**100%**
Proportion of suburban traffic serviced by macrocells		100%
Proportion of suburban traffic serviced by microcells		0%
Proportion of suburban traffic serviced by picocells		0%
Proportion of urban CDMA data traffic serviced by different cell types		**100%**
Proportion of urban traffic serviced by macrocells		100%
Proportion of urban traffic serviced by microcells		0%
Proportion of urban traffic serviced by picocells		0%
Proportion of suburban CDMA data traffic serviced by different cell types		**100%**
Proportion of suburban traffic serviced by macrocells		100%
Proportion of suburban traffic serviced by microcells		0%
Proportion of suburban traffic serviced by picocells		0%

CDMA cell parameters			
Cell range			
Macroc Macrocell - urban area	km	5,00	5,00
Macroc Macrocell - suburban area	km	10,00	10,00
Macroc Macrocell - rural area	km	20,00	20,00
BTS - voice traffic capacity			
Sector capacity			
Macrocell - urban area	Erl	0,00	0,00
Macrocell - suburban area	Erl	0,00	0,00
Macrocell - rural area	Erl	0,00	0,00
Microcell	Erl	0,00	0,00
Picocell	Erl	0,00	0,00
BTS - data traffic capacity			
Sector capacity			
Macrocell - urban area	kbps	19,20	19,20
Macrocell - suburban area	kbps	19,20	19,20
Macrocell - rural area	kbps	19,20	19,20
Microcell	kbps	19,20	19,20
Picocell	kbps	19,20	19,20
Sector capacity - EVDO			
Macrocell - urban area	kbps	3 100,00	
Macrocell - suburban area	kbps	3 100,00	
Macrocell - rural area	kbps	3 100,00	
Microcell	kbps	3 100,00	
Picocell	kbps	3 100,00	

CDMA sites configuration	
Macrocell - urban area	**100%**
Omni sectored	3%
2 sectors	16%
3 sectors	81%
Macrocells - suburban area	**100%**
Omni sectored	0%
2 sectors	19%
3 sectors	81%
Macrocell: Macrocells - rural area	**100%**
Omni sectored	3%
2 sectors	36%
3 sectors	61%
Average number of cells per site	
Microcells	2
Picocells	2

Transmission	
% of stand-alone ETH radiolink sites in aggregation network	5,57%
as a ratio of stand-alone ETH radiolink sites in the aggregation network to total number of sites in a network	
% of stand-alone ETH radiolink sites in core network	0,00%
as a ratio of stand-alone ETH radiolink sites in the core network to total number of sites in a network	
BTS/BTS-BSC/RNC logical layer	
Ethernet radiolink 20 Mb/s microwave link	16,60%
Ethernet radiolink 100 Mb/s microwave link	55,20%
Ethernet radiolink 150 Mb/s microwave link	18,70%
Ethernet radiolink 200 Mb/s microwave link	9,50%
average number of sections per BTS / Node B link (ETH radiolinks)	2,98

Network Statistics - structure

Data Type	Unit	Value
Parameters of 2Mbit/s links		
Capacity of 2Mbit/s line in Erlangs	Erl	21
MDF, ODF specification		
MDF		
MDF - Type 1	ports	
MDF - Type 2	ports	
MDF - Type 3	ports	
MDF - Type 4	ports	
MDF - Type 5	ports	
ODF		
ODF - Type 1	ports	
ODF - Type 2	ports	
ODF - Type 3	ports	
ODF - Type 4	ports	
ODF - Type 5	ports	

MSAN specification

		Subscriber cards	Trunking card	Voice processing capacity	Switching capacity
Chassis					
Chassis - Type 1	slots				
Chassis - Type 2	slots				
Chassis - Type 3	slots				
Chassis - Type 4	slots				
Chassis - Type 5	slots				
Subscriber cards					
Subscriber cards - Type 1 - ADSL	ports				
Subscriber cards - Type 2 - SHDSL	ports				
Subscriber cards - Type 3 - VDSL	ports				
Subscriber cards - Type 4 - POTS	ports				
Subscriber cards - Type 5 - ISDN - BRA	ports				
Trunking card					
Trunking card - Type 1	GE ports				
Optical module - SFP/Xenpack					
Type 1 - LR - (Long Range)	GE ports				

OLT

		Subscriber cards	Trunking card
Chassis			
Chassis - Type 1	slots		
Subscriber cards			
Subscriber cards - Type 1 - GPON	ports		
Split ratio	subscribers per GPON port		
Trunking card			
Trunking card - Type 1	GE ports		
Optical module - Xenpack			
Optical module - Trunking card	GE		
Optical module - PON	GE		

Access Ethernet switches specification

Chassis		
Chassis - Type 1	Subscriber cards	
Chassis - Type 1	Trunking card	
Subscriber cards		
Subscriber cards - Type 1 - P2P	GE ports	
Trunking card		
Trunking card - Type 1	GE ports	
Optical module		
Optical module - Trunking card	GE	
Optical module - Subscriber cards	GE	

Rings statistics

Ring throughput (backhaul)	Gbit/s	
Operational allowance	%	
Ring throughput (ETH-IP)	Gbit/s	
Operational allowance	%	

Ethernet Switches specification		
Chassis		
Chassis - Type 1	slots	
Chassis - Type 1	Switching cards	
Chassis - Type 2	slots	
Chassis - Type 2	Switching cards	
Chassis - Type 3	slots	
Chassis - Type 3	Switching cards	
Switching cards		
Switching cards - Type 1	Gbit/s	
Trunking cards - GE		
Trunking cards - GE - Type 1	SFP slots	
Trunking cards - GE - Type 2	SFP slots	
Trunking cards - 10GE		
Trunking cards - 10GE - Type 3	XFP slots	
Trunking cards - 10GE - Type 4	Xenpack slots	
Optical module - SFP/Xenpack		
Type 1 - SR - (Short Range)	GE	
Type 2 - LR (Long Range)	GE	
Optical module - XFP		
Type 1 - SR - (Short Range)	10 GE	
Type 2 - LR (Long Range)	10 GE	
Optical module - Xenpack		
Type 1 - SR - (Short Range)	10 GE	
Type 2 - LR (Long Range)	10 GE	

IP Routers specification - Local Node (LN)		
Chassis		
Chassis - Type 1	slots	
Chassis - Type 1	Switching cards	
Chassis - Type 2	slots	
Chassis - Type 2	Switching cards	
Chassis - Type 3	slots	
Chassis - Type 3	Switching cards	
Switching cards		
Switching cards - Type 1	Gbit/s	
Trunking cards - GE		
Trunking cards - GE - Type 1	SFP slots	
Trunking cards - GE - Type 2	SFP slots	
Trunking cards - 10GE		
Trunking cards - 10GE - Type 3	XFP slots	
Trunking cards - 10GE - Type 4	Xenpack slots	
Optical module - SFP/Xenpack		
Type 1 - SR - (Short Range)	GE	
Type 2 - LR (Long Range)	GE	
Optical module - XFP		
Type 1 - SR - (Short Range)	10 GE	
Type 2 - LR (Long Range)	10 GE	
Optical module - Xenpack		
Type 1 - SR - (Short Range)	10 GE	
Type 2 - LR (Long Range)	10 GE	

IP Routers specification - Transit Node (TN)		
Chassis		
Chassis - Type 1	slots	
Chassis - Type 1	Switching cards	
Chassis - Type 2	slots	
Chassis - Type 2	Switching cards	
Switching cards		
Switching cards - Chassis - Type 1	Gbit/s	
Switching cards - Chassis - Type 2	Gbit/s	
Trunking cards - 10GE		
Trunking cards - 10GE - Chassis - Type 1	Xenpack slots	
Trunking cards - 10GE - Chassis - Type 2	Xenpack slots	
Optical module - Xenpack		
Type 1 - SR - (Short Range)	10 GE	
Type 2 - LR (Long Range)	10 GE	

DWDM specification		
Chassis		
Chassis - Type 1	slots	
Chassis - Type 2	slots	
Trunking cards - 10GE		
Trunking cards - 10GE - Type 1	ports	
Trunking cards - 10GE - Type 2	ports	
Trunking cards - 100GE		
Trunking cards - 100GE - Type 3	ports	
Trunking cards - 100GE - Type 4	ports	
Usage of DWDM		
AN - LN	Yes/No	
LN - TN	Yes/No	
TN - TN	Yes/No	

MGW specification (IBCF function)		
Chassis		
Chassis - Type 1	slots	
Chassis - Type 2	slots	
Chassis - Type 1	Gbit/s	
Chassis - Type 2	Gbit/s	
Switching cards		
Switching cards - Type 1	ERL	
Trunking cards - GE		
Trunking cards - GE - Type 1	SFP slots	
Trunking cards - E1/STM		
Trunking card - Type 1	E1	
Trunking card - Type 2	E1	
Trunking card - Type 3	STM-1	
Trunking card - Type 4	STM-4	
Optical module - SFP/Xenpack		
Type 1 - SR - (Short Range)	GE	

Soft switch		
Main unit / rack		
Main unit / rack - Type 1	Expansion unit	
Expansion unit		
Expansion unit - Type 1	BHCA	

IMS specification		
IMS - Main unit / rack	IMS - Service frame	
IMS - Service frame	Service card	
IMS - Service frame - Type 1		
IMS - Service card - Type 1 - CSC (iCG9815 UPBA)		
IMS - Service card - Type 2 - UGC (UGV3200 UPBA)	ERL	
IMS - Service card - Type 3 - ATS (ATS9900 UPBA)	subscribers	
IMS - Service card - Type 4 - CSCF / MRCF (CSC3300 UPBA)	subscribers	
IMS - Service card - Type 4 - CSCF / MRCF (CSC3300 UPBA)	BHCA	
IMS - Service card - Type 5 - MRFP1	ERL	
IMS - Service card - Type 6 - MRFP2	ERL	
IMS - Service frame - Type 2 - HSS9820		
IMS - Service card - Type 1 - HSS control	subscribers	
IMS - Service card - Type 2 - HSS USCDB	subscribers	
IMS - Service card - Type 2 - HSS DISKAP	subscribers	

AAA server		
AAA server	subscribers	

BRAS		
BRAS	subscribers	

MSS		
MSS: basic unit and softw are	BHCA	
MSS: processor extension	BHCA	

HLR		
HLR: base unit	BHCA	
HLR: base unit	subscribers	
HLR: base unit	subscribers	

Length of fiber cables		
AN - LN Urban	kilometer	
AN - LN Suburban	kilometer	
AN - LN Rural	kilometer	
LN - TN Urban	kilometer	
LN - TN Suburban	kilometer	
LN - TN Rural	kilometer	
TN - TN Urban	kilometer	
TN - TN Suburban	kilometer	
TN - TN Rural	kilometer	

Trench sharing		
% of total length which is in a trench shared with access network cables		
AN - LN Urban	%	
AN - LN Suburban	%	
AN - LN Rural	%	
LN - TN Urban	%	
LN - TN Suburban	%	
LN - TN Rural	%	
TN - TN Urban	%	
TN - TN Suburban	%	
TN - TN Rural	%	

Nonlinearity factor		
Urban	%	
Suburban	%	
Rural	%	

Average number of fibres in cable		Nominal
AN - LN	fibres	
LN - TN	fibres	
TN - TN	fibres	

Access network in urban geotype		
Number of access lines		
Copper access lines	lines	
Fiber GPON access lines	lines	
Average number of GPON access lines per one port in OLT	lines	32,00
Fiber P2P access lines	lines	
Trenches		
Length of trenches	km	
Copper cables		
Length of copper cables - Type 1	km	
Length of copper cables - Type 2	km	
Length of copper cables - Type 3	km	
Length of copper cables - Type 4	km	
Length of copper cables - Type 5	km	
Length of copper cables - Type 6	km	
Length of copper cables - Type 7	km	
Length of copper cables - Type 8	km	
Length of copper cables - Type 9	km	
Length of copper cables - Type 10	km	
Copper cabinets		
Number of copper cabinets - Type 1	pieces	
Number of copper cabinets - Type 2	pieces	
Number of copper cabinets - Type 3	pieces	
Number of copper cabinets - Type 4	pieces	
Number of copper cabinets - Type 5	pieces	
Copper distribution points		
Number of copper distribution points - Type 1	pieces	
Number of copper distribution points - Type 2	pieces	
Number of copper distribution points - Type 3	pieces	
Number of copper distribution points - Type 4	pieces	
Number of copper distribution points - Type 5	pieces	
Fiber cables		
Length of Fiber cables – 12 fibers	km	
Length of Fiber cables – 24 fibers	km	
Length of Fiber cables – 48 fibers	km	
Length of Fiber cables – 72 fibers	km	
Length of Fiber cables – 96 fibers	km	
Length of Fiber cables – 144 fibers	km	
Fiber cabinets		
Number of fiber cabinets - Type 1	pieces	
Number of fiber cabinets - Type 2	pieces	
Number of fiber cabinets - Type 3	pieces	
Number of fiber cabinets - Type 4	pieces	
Number of fiber cabinets - Type 5	pieces	
Fiber distribution points		
Number of fiber distribution points - Type 1	pieces	
Number of fiber distribution points - Type 2	pieces	
Number of fiber distribution points - Type 3	pieces	
Number of fiber distribution points - Type 4	pieces	
Number of fiber distribution points - Type 5	pieces	
Other access network equipment		
Number of other access network equipment - Type 1	pieces	
Number of other access network equipment - Type 2	pieces	
Number of other access network equipment - Type 3	pieces	
Number of other access network equipment - Type 4	pieces	
Number of other access network equipment - Type 5	pieces	

Access network in rural geotype

Number of access lines		
Copper access lines	lines	
Fiber GPON access lines	lines	
Average number of GPON access lines per one port in OLT	lines	32,00
Fiber P2P access lines	lines	
Trenches		
Length of trenches	km	
Copper cables		
Length of copper cables - Type 1	km	
Length of copper cables - Type 2	km	
Length of copper cables - Type 3	km	
Length of copper cables - Type 4	km	
Length of copper cables - Type 5	km	
Length of copper cables - Type 6	km	
Length of copper cables - Type 7	km	
Length of copper cables - Type 8	km	
Length of copper cables - Type 9	km	
Length of copper cables - Type 10	km	
Copper cabinets		
Number of copper cabinets - Type 1	pieces	
Number of copper cabinets - Type 2	pieces	
Number of copper cabinets - Type 3	pieces	
Number of copper cabinets - Type 4	pieces	
Number of copper cabinets - Type 5	pieces	
Copper distribution points		
Number of copper distribution points - Type 1	pieces	
Number of copper distribution points - Type 2	pieces	
Number of copper distribution points - Type 3	pieces	
Number of copper distribution points - Type 4	pieces	
Number of copper distribution points - Type 5	pieces	
Fiber cables		
Length of Fiber cables – 12 fibers	km	
Length of Fiber cables – 24 fibers	km	
Length of Fiber cables – 48 fibers	km	
Length of Fiber cables – 72 fibers	km	
Length of Fiber cables – 96 fibers	km	
Length of Fiber cables – 144 fibers	km	
Fiber cabinets		
Number of fiber cabinets - Type 1	pieces	
Number of fiber cabinets - Type 2	pieces	
Number of fiber cabinets - Type 3	pieces	
Number of fiber cabinets - Type 4	pieces	
Number of fiber cabinets - Type 5	pieces	
Fiber distribution points		
Number of fiber distribution points - Type 1	pieces	
Number of fiber distribution points - Type 2	pieces	
Number of fiber distribution points - Type 3	pieces	
Number of fiber distribution points - Type 4	pieces	
Number of fiber distribution points - Type 5	pieces	
Other access network equipment		
Number of other access network equipment - Type 1	pieces	
Number of other access network equipment - Type 2	pieces	
Number of other access network equipment - Type 3	pieces	
Number of other access network equipment - Type 4	pieces	
Number of other access network equipment - Type 5	pieces	

Types of ducts

Urban		
Aerial		
Trench	%	
Primary duct - 1 hole	%	
Primary duct - 2 holes	%	
Primary duct - 6 holes	%	
Primary duct - 12 holes	%	
Primary duct - 24 holes	%	
Primary duct - 48 and more holes	%	
		100%
Suburban		
Aerial		
Trench	%	
Primary duct - 1 hole	%	
Primary duct - 2 holes	%	
Primary duct - 6 holes	%	
Primary duct - 12 holes	%	
Primary duct - 24 holes	%	
Primary duct - 48 and more holes	%	
		100%
Rural		
Aerial		
Trench	%	
Primary duct - 1 hole	%	
Primary duct - 2 holes	%	
Primary duct - 6 holes	%	
Primary duct - 12 holes	%	
Primary duct - 24 holes	%	
Primary duct - 48 and more holes	%	
		100%

Urban geotype

Density factors		
Manholes density	units/km	
Joints density	units/km	
Ground reconstruction statistics		
Passages under obstacles	%	
Ground reconstruction	%	
Ground reconstruction types		
Grass reconstruction	%	
Sidewalk reconstruction	%	
Asphalt pavement reconstruction	%	
Concrete pavement reconstruction	%	
No reconstruction	%	
Passages under obstacles		
Passage under road (up to 15m)	%	
Passage under road (above 15m)	%	
Passage under tramway track	%	
Passage under railway tracks	%	
Passage under rivers and channel	%	
Passage under other obstacles	%	

Rural geotype		
Density factors		
Manholes density	units/km	
Joints density	units/km	
Ground reconstruction statistics		
Passages under obstacles	%	
Ground reconstruction	%	
Ground reconstruction types		
Grass reconstruction	%	
Sidew alk reconstruction	%	
Asphalt pavement reconstruction	%	
Concrete pavement reconstruction	%	
No reconstruction	%	
Passages under obstacles		
Passage under road (up to 15m)	%	
Passage under road (above 15m)	%	
Passage under tramw ay track	%	
Passage under railw ay tracks	%	
Passage under rivers and channel	%	
Passage under other obstacles	%	
Volumes of ground reconstruction		
Average trench width		
Grass	meters	
Sidew alk reconstruction	meters	
Asphalt pavement	meters	
Concrete pavement	meters	
Average passage under obstacles width		
Passage under road (up to 15m)	meters	7,0
Passage under road (above 15m)	meters	20,0
Passage under tramw ay track	meters	5,0
Passage under railw ay tracks	meters	20,0
Passage under rivers and channel	meters	21,0
Passage under other obstacles	meters	21,0
Additional w orks		
Consent of the landowners		
Density of parcels - Urban	units/km	
Density of parcels - Suburban	units/km	
Density of parcels - Rural	units/km	

HCC Data – Structure

Ref.	HCC name	Unit	Unit price (GEL)	Unit price total (GEL)	Useful lifetime (years)	Price change ratio (%)	Time to build an asset (years)	Net book value (NBV) and gross book value (GBV) ratio (%)
	WACC	14,95%						
Infrastructure								
	Trench	km		0,00				
	Primary duct - 1 hole	km		0,00				
	Primary duct - 2 holes	km		0,00				
	Primary duct - 6 holes	km		0,00				
	Primary duct - 12 holes	km		0,00				
	Primary duct - 24 holes	km		0,00				
	Primary duct - 48 and more holes	km		0,00				
	Secondary duct – HDPE tube laid in the primary duct	km		0,00				
	Secondary duct – HDPE tube laid in the trench	km		0,00				
	Manholes	pieces		0,00				
Ground reconstruction								
	Grass reconstruction	m2		0,00				
	Sidew alk reconstruction	m2		0,00				
	Asphalt pavement reconstruction	m2		0,00				
	Concrete pavement reconstruction	m2		0,00				
Passages under obstacles								
	Passage under road (up to 15m)	pieces		0,00				
	Passage under road (above 15m)	pieces		0,00				
	Passage under tramw ay track	pieces		0,00				
	Passage under railw ay tracks	pieces		0,00				
	Passage under rivers and channel	pieces		0,00				
	Passage under other obstacles	pieces		0,00				
Additional w orks								
	Project w orks	km		0,00				
	Consent of the landow ners	pieces		0,00				
	Geodetic service	km		0,00				
Copper cables								
	Copper cables - Type 1	km		0,00				
	Copper cables - Type 2	km		0,00				
	Copper cables - Type 3	km		0,00				
	Copper cables - Type 4	km		0,00				
	Copper cables - Type 5	km		0,00				
	Copper cables - Type 6	km		0,00				
	Copper cables - Type 7	km		0,00				
	Copper cables - Type 8	km		0,00				
	Copper cables - Type 9	km		0,00				
	Copper cables - Type 10	km		0,00				
Joints for copper cables								
	Joint for copper cables - Type 1	pieces		0,00				
	Joint for copper cables - Type 2	pieces		0,00				
	Joint for copper cables - Type 3	pieces		0,00				
	Joint for copper cables - Type 4	pieces		0,00				
	Joint for copper cables - Type 5	pieces		0,00				
	Joint for copper cables - Type 6	pieces		0,00				
	Joint for copper cables - Type 7	pieces		0,00				
	Joint for copper cables - Type 8	pieces		0,00				
	Joint for copper cables - Type 9	pieces		0,00				
	Joint for copper cables - Type 10	pieces		0,00				
Copper cabinets								
	Copper cabinets - Type 1	pieces		0,00				
	Copper cabinets - Type 2	pieces		0,00				
	Copper cabinets - Type 3	pieces		0,00				
	Copper cabinets - Type 4	pieces		0,00				
	Copper cabinets - Type 5	pieces		0,00				
Copper distribution points								
	Copper distribution points - Type 1	pieces		0,00				
	Copper distribution points - Type 2	pieces		0,00				
	Copper distribution points - Type 3	pieces		0,00				
	Copper distribution points - Type 4	pieces		0,00				
	Copper distribution points - Type 5	pieces		0,00				
Fiber cable								
	Fiber cable – 12 fibers	km		0,00				
	Fiber cable – 24 fibers	km		0,00				
	Fiber cable – 48 fibers	km		0,00				
	Fiber cable – 72 fibers	km		0,00				
	Fiber cable – 96 fibers	km		0,00				
	Fiber cable – 144 fibers	km		0,00				

Ref.	HCC name	Unit	Unit price (GEL)	Unit price total (GEL)	Useful lifetime (years)	Price change ratio (%)	Time to build an asset (years)	Net book value (NBV) and gross book value (GBV) ratio (%)
Joints for fiber cables								
	Joint for 12 fibers	pieces		0,00				
	Joint for 24 fibers	pieces		0,00				
	Joint for 48 fibers	pieces		0,00				
	Joint for 72 fibers	pieces		0,00				
	Joint for 96 fibers	pieces		0,00				
	Joint for 144 fibers	pieces		0,00				
Fiber cabinets								
	Fiber cabinets - Type 1	pieces		0,00				
	Fiber cabinets - Type 2	pieces		0,00				
	Fiber cabinets - Type 3	pieces		0,00				
	Fiber cabinets - Type 4	pieces		0,00				
	Fiber cabinets - Type 5	pieces		0,00				
Fiber distribution points								
	Fiber distribution points - Type 1	pieces		0,00				
	Fiber distribution points - Type 2	pieces		0,00				
	Fiber distribution points - Type 3	pieces		0,00				
	Fiber distribution points - Type 4	pieces		0,00				
	Fiber distribution points - Type 5	pieces		0,00				
Other access network equipment								
	Other access netw ork equipment - Type 1	km		0,00				
	Other access netw ork equipment - Type 2	km		0,00				
	Other access netw ork equipment - Type 3	km		0,00				
	Other access netw ork equipment - Type 4	km		0,00				
	Other access netw ork equipment - Type 5	km		0,00				
MDF								
	MDF - Type 1	pieces		0,00				
	MDF - Type 2	pieces		0,00				
	MDF - Type 3	pieces		0,00				
	MDF - Type 4	pieces		0,00				
	MDF - Type 5	pieces		0,00				
ODF								
	ODF - Type 1	pieces		0,00				
	ODF - Type 2	pieces		0,00				
	ODF - Type 3	pieces		0,00				
	ODF - Type 4	pieces		0,00				
	ODF - Type 5	pieces		0,00				
MSAN								
	Chassis - Type 1	pieces		0,00				
	Chassis - Type 2	pieces		0,00				
	Chassis - Type 3	pieces		0,00				
	Chassis - Type 4	pieces		0,00				
	Chassis - Type 5	pieces		0,00				
	Subscriber cards - Type 1 - ADSL	pieces		0,00				
	Subscriber cards - Type 2 - SHDSL	pieces		0,00				
	Subscriber cards - Type 3 - VDSL	pieces		0,00				
	Subscriber cards - Type 4 - POTS	pieces		0,00				
	Subscriber cards - Type 5 - ISDN - BRA	pieces		0,00				
	Trunking card - Type 1	pieces		0,00				
	Optical module - Trunking card	pieces		0,00				
OLT								
	Chassis - Type 1	pieces		0,00				
	Subscriber cards - Type 1 - GPON	pieces		0,00				
	Trunking card - Type 1	pieces		0,00				
	Optical module - 10GE Type 1	pieces		0,00				
	Optical module - PON	pieces		0,00				
	ONT	pieces		0,00				

Ref.	HCC name	Unit	Unit price (GEL)	Unit price total (GEL)	Useful lifetime (years)	Price change ratio (%)	Time to build an asset (years)	Net book value (NBV) and gross book value (GBV) ratio (%)
Joints for fiber cables								
	Joint for 12 fibers	pieces		0,00				
	Joint for 24 fibers	pieces		0,00				
	Joint for 48 fibers	pieces		0,00				
	Joint for 72 fibers	pieces		0,00				
	Joint for 96 fibers	pieces		0,00				
I. Access Ethernet switches specification								
1	Chassis - Type 1	pieces		0,00				
2	Subscriber cards - Type 1 - P2P	pieces		0,00				
3	Trunking cards - GE - Type 1	pieces		0,00				
4	Optical module - Subscriber cards	pieces		0,00				
5	Optical module - Trunking card	pieces		0,00				
Edge Ethernet Switch								
	Chassis - Type 1	pieces		0,00				
	Chassis - Type 2	pieces		0,00				
	Chassis - Type 3	pieces		0,00				
	Switching cards - Type 1	pieces		0,00				
	Trunking cards - GE - Type 1	pieces		0,00				
	Trunking cards - GE - Type 2	pieces		0,00				
	Trunking cards - 10GE - Type 3	pieces		0,00				
	Trunking cards - 10GE - Type 4	pieces		0,00				
	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	pieces		0,00				
	Optical module - XFP - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - XFP - Type 2 - LR (Long Range)	pieces		0,00				
	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces		0,00				
Core Ethernet Switch								
	Chassis - Type 1 (Catalyst 6504)	pieces		0,00				
	Chassis - Type 2 (Catalyst 6506)	pieces		0,00				
	Chassis - Type 3 (Catalyst 6509)	pieces		0,00				
	Switching cards - Type 1	pieces		0,00				
	Trunking cards - GE - Type 1	pieces		0,00				
	Trunking cards - GE - Type 2	pieces		0,00				
	Trunking cards - 10GE - Type 3	pieces		0,00				
	Trunking cards - 10GE - Type 4	pieces		0,00				
	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	pieces		0,00				
	Optical module - XFP - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - XFP - Type 2 - LR (Long Range)	pieces		0,00				
	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces		0,00				
Local Node - IP router								
	Chassis - Type 1 (Cisco 7604)	pieces		0,00				
	Chassis - Type 2 (Cisco 7606)	pieces		0,00				
	Chassis - Type 3 (Cisco 7609)	pieces		0,00				
	Switching cards - Type 1	pieces		0,00				
	Trunking cards - GE - Type 1	pieces		0,00				
	Trunking cards - GE - Type 2	pieces		0,00				
	Trunking cards - 10GE - Type 3	pieces		0,00				
	Trunking cards - 10GE - Type 4	pieces		0,00				
	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	pieces		0,00				
	Optical module - XFP - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - XFP - Type 2 - LR (Long Range)	pieces		0,00				
	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces		0,00				

Ref.	HCC name	Unit	Unit price (GEL)	Unit price total (GEL)	Useful lifetime (years)	Price change ratio (%)	Time to build an asset (years)	Net book value (NBV) and gross book value (GBV) ratio (%)
Joints for fiber cables								
	Joint for 12 fibers	pieces		0,00				
	Joint for 24 fibers	pieces		0,00				
	Joint for 48 fibers	pieces		0,00				
	Joint for 72 fibers	pieces		0,00				
	Joint for 96 fibers	pieces		0,00				
I. Access Ethernet switches specification								
1	Chassis - Type 1	pieces		0,00				
2	Subscriber cards - Type 1 - P2P	pieces		0,00				
3	Trunking cards - GE - Type 1	pieces		0,00				
4	Optical module - Subscriber cards	pieces		0,00				
5	Optical module - Trunking card	pieces		0,00				
Transit Node - IP router								
	Chassis - Type 1	pieces		0,00				
	Chassis - Type 2	pieces		0,00				
	Switching cards - Chassis - Type 1	pieces		0,00				
	Switching cards - Chassis - Type 2	pieces		0,00				
	Trunking cards - 10GE - Chassis - Type 1 (Cisco 12406)	pieces		0,00				
	Trunking cards - 10GE - Chassis - Type 2 (CRS-16/S)	pieces		0,00				
	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces		0,00				
DWDM								
	Chassis - Type 1	pieces		0,00				
	Chassis - Type 2	pieces		0,00				
	Trunking cards - 10GE - Type 1	pieces		0,00				
	Trunking cards - 10GE - Type 2	pieces		0,00				
	Trunking cards - 100GE - Type 3	pieces		0,00				
	Trunking cards - 100GE - Type 4	pieces		0,00				
MGW								
	Chassis - Type 1	pieces		0,00				
	Chassis - Type 2	pieces		0,00				
	Switching cards - Type 1	pieces		0,00				
	Trunking cards - GE - Type 1	pieces		0,00				
	Trunking card - Type 1	pieces		0,00				
	Trunking card - Type 2	pieces		0,00				
	Trunking card - Type 3	pieces		0,00				
	Trunking card - Type 4	pieces		0,00				
	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)	pieces		0,00				
IMS								
	IMS - Main unit / rack	pieces		0,00				
	IMS - Service frame	pieces		0,00				
	IMS - Service card - Type 1 - CSC (iCG9815 UPBA)	pieces		0,00				
	IMS - Service card - Type 2 - UGC (UGV3200 UPBA)	pieces		0,00				
	IMS - Service card - Type 3 - ATS (ATS9900 UPBA)	pieces		0,00				
	IMS - Service card - Type 4 - CSCF / MRCF (CSC3300 UPBA)	pieces		0,00				
	IMS - Service card - Type 5 - MRFP1	pieces		0,00				
	IMS - Service card - Type 6 - MRFP2	pieces		0,00				
	IMS - Service card - Type 1 - HSS control	pieces		0,00				
	IMS - Service card - Type 2 - HSS USCDB	pieces		0,00				
	IMS - Service card - Type 2 - HSS DISKAP	pieces		0,00				
	Licenses - Type 1 - CSC (iCG9815 UPBA)	pieces		0,00				
	Licenses - Type 2 - UGC (UGV3200 UPBA)	pieces		0,00				
	Licenses - Type 3 - ATS (ATS9900 UPBA)	pieces		0,00				
	Licenses - Type 4 - CSCF / MRCF (CSC3300 UPBA)	pieces		0,00				
	Licenses - Type 5 - MRFP1	pieces		0,00				
	Licenses - Type 6 - MRFP2	pieces		0,00				
	Licenses - HSS9820	pieces		0,00				
Soft switch								
	Main unit / rack - Type 1	pieces		0,00				
	Expansion unit - Type 1	pieces		0,00				
AAA server								
	AAA server	pieces		0,00				
BRAS								
	BRAS	pieces		0,00				
Billing System								
	Billing System - Voice services	pieces		0,00				
Site								
	Macrocell: tower and site preparation	pieces		0,00				
	Microcell: site preparation	pieces		0,00				
	Picocell: site preparation	pieces		0,00				
	Stand-alone transmission radiolink: tower and site preparation	pieces		0,00				
BTS								
	Macrocell: equipment (omni sector)	pieces		0,00				
	Macrocell: equipment (2 sector)	pieces		0,00				
	Macrocell: equipment (3 sector)	pieces		0,00				
	Microcell	pieces		0,00				
	Picocell	pieces		0,00				
Ethernet Radiolink								
	Ethernet radiolink 20 Mb/s microwave link	pieces		0,00				
	Ethernet radiolink 100 Mb/s microwave link	pieces		0,00				
	Ethernet radiolink 150 Mb/s microwave link	pieces		0,00				
	Ethernet radiolink 200 Mb/s microwave link	pieces		0,00				
BSC/RNC								
	BSC: base unit	pieces		0,00				
	BSC: expansion units	pieces		0,00				
MSC								
	MSS: basic unit and software	pieces		0,00				
	MSS: processor extension	pieces		0,00				
	MGW: basic unit and software	pieces		0,00				
Other Network								
	HLR: base unit	pieces		0,00				
License and frequency fee								
	Concession right - CDMA (total value)	pieces		0,00				

Mark-ups – Structure

Data Type	Unit	Value
Cost rates on network capital cost (GRC)		
A. Mark-up - Network operation, maintenance and planning expenses		
Fibre cables and ducts	%	
Access Nodes	%	
Transmission network	%	
Switching network	%	
Site infrastructure	%	
BSS intrastructure	%	
Transmission	%	
MSC/MGW and other network	%	
B. Mark-up - NMS		
Access Nodes	%	
Transmission network	%	
Switching network	%	
BSS intrastructure	%	
Transmission	%	
MSC/MGW and other network	%	
Cost rates on network operational cost (OPEX)		
C. Mark-up - Administration and support activities operational costs		
Total network operational cost	%	
D. Mark-up - Administration and support activities capital costs		
Total network infrastructure	%	

Service Matrix – Structure

Service type	Network Components														
	Access Node (AN)	Local Node (LN)	Transit Node (TN)	Transmission - AN - LN	Transmission - LN - LN	Transmission - LN - TN	Transmission - LN - POI	Transmission - TN - TN	Transmission - TN - POI	MGW	IMS	Softswitch	Billing system	AAA server	BRAS
On-net calls															
Interconnection calls – outgoing on local level															
Interconnection calls – outgoing on transit level															
Interconnection calls – incoming on local level															
Interconnection calls – incoming on transit level															
Interconnection calls – transit on local level															
Interconnection calls – international outgoing calls															
Interconnection calls – international incoming calls															
Other voice service															
Internet access services															
DTV services															
TDM leased lines national															
TDM leased lines international															
Data transmission end to end national															
Data transmission end to end international															
Data transmission local															
Data transmission backhaul															
Data transmission trunk															

3. Calculations Sheets

Demand – Structure

			Volume		Access Node (AN)	Local Node (LN)	Transit Node (TN)	Transmission - AN - LN	Transmission - LN - LN	Transmission - LN - TN	Transmission - LN - POI	Transmission - TN - TN	Transmission - TN - POI	MGW	IMS	Softswitch	Billing system	AAA server	BRAS
	Routing matrix (voice services)																		
			Annual voice traffic [minutes]																
121	On-net calls	minutes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
122	Interconnection calls – outgoing on local level	minutes	0	1	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
123	Interconnection calls – outgoing on transit level	minutes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
124	Interconnection calls – incoming on local level	minutes	0	1	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
125	Interconnection calls – incoming on transit level	minutes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
126	Interconnection calls – transit on local level	minutes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
127	Interconnection calls – international outgoing calls	minutes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
128	Interconnection calls – international incoming calls	minutes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
129	Other voice service	minutes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Total weighted service volumes	minutes	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0																
	Average utilization of network component				0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Average throughput per port																		
	Busy Hour to Average Hour traffic ratio	%			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Volume of voice lines	subscribers			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Average throughput per port	[BHT - mERL]			0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	BHCA				#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Volume of voice lines	subscribers			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BHCA per port	BHCA			0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

			Volume		Access Node (AN)	Local Node (LN)	Transit Node (TN)	Transmission - AN - LN	Transmission - LN - LN	Transmission - LN - TN	Transmission - LN - POI	Transmission - TN - TN	Transmission - TN - POI	MGW	IMS	Softswitch	Billing system	AAA server	BRAS
	Routing matrix (data services)																		
			Annual data traffic [Gbytes]																
133	Annual traffic - Internet access services	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
134	Annual traffic - DTV services	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Total weighted service volumes	Gbytes	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Average utilization of network component				0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
135	Annual traffic - TDM leased lines national	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
136	Annual traffic - TDM leased lines international	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Total weighted service volumes	Gbytes	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Average utilization of network component				0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
137	Annual traffic - Data transmission end to end national	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
138	Annual traffic - Data transmission end to end international	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
139	Annual traffic - Data transmission local	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
140	Annual traffic - Data transmission backhaul	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
141	Annual traffic - Data transmission trunk	Gbytes	0		0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Total weighted service volumes	Gbytes	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Average utilization of network component				0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

	CDMA				
	CDMA Data Conversion				
	CDMA Data kbit/min per channel element		9 180,00		
	CDMA Data MB/min per channel element		1,15		
	1 CDMA MB to minute conversion factor		0,87		
	EVDO Conversion				
	EVDO kbit/min per channel element		184 320,00		
	EVDO MB/min per channel element		23,04		
	1 EVDO MB to minute conversion factor		0,04		
	CDMA Conversion				
	CDMA kbit/min per channel element		153 588,01		
	CDMA MB/min per channel element		19,20		
	1 CDMA MB to minute conversion factor		0,05		
	Unbilled air-time				
	Unsuccessful calls per 1 successful call		0,00		
	Waiting time for succesful calls (per 1 min. of calls)		#DIV/0!		
	Waiting time for unsuccesful calls (per 1 min. of calls)		#DIV/0!		
	Waiting time per 1 minute of successful call		#DIV/0!		
	Number of SIM cards (at year end)				
10	Number of SIM cards (at year end)	subscribers	0	1	
	Voice traffic volumes				
145	Year total on-net minutes	minutes	0	1	
146	Year total off-net minutes	minutes	0	1	
147	Year total incoming minutes	minutes	0	0	
	Packet data traffic volumes				
149	Year total up-link (CDMA-data)	Gbytes	0	1	
149	Year total dow n-link (CDMA-data)	Gbytes	0		

Weighted service volumes

		BTS	BSC	MSC/MGW	BTS-BSC	BSC-MSC	MSC-MSC	MSC-IC
Voice traffic volumes								
On-net calls	minutes	0	0	0	0	0	0	0
Interconnection calls – outgoing on transit level	minutes	0	0	0	0	0	0	0
Interconnection calls – incoming on transit level	minutes	0	0	0	0	0	0	0
Packet data traffic volumes								
Year total up-link (CDMA-data)	Gbytes	0	0	0	0	0	0	0
Year total down-link (CDMA-data)	Gbytes	0	0	0	0	0	0	0
Voice traffic volumes								
On-net calls	call attemps	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – outgoing on transit level	call attemps	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – incoming on transit level	call attemps	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Weighted service volumes in equivalent minutes

		BTS	BSC	MSC/MGW	BTS-BSC	BSC-MSC	MSC-MSC	MSC-IC
Voice traffic volumes								
On-net calls	minutes	0	0	0	0	0	0	0
Interconnection calls – outgoing on transit level	minutes	0	0	0	0	0	0	0
Interconnection calls – incoming on transit level	minutes	0	0	0	0	0	0	0
Packet data traffic volumes								
Year total up-link (CDMA-data)	Gbytes	0	0	0	0	0	0	0
Year total down-link (CDMA-data)	Gbytes	0	0	0	0	0	0	0
Voice traffic volumes								
On-net calls	call attemps	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – outgoing on transit level	call attemps	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – incoming on transit level	call attemps	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Busy Hour Traffic

		BTS	BSC	MSC/MGW	BTS-BSC	BSC-MSC	MSC-MSC	MSC-IC
Voice traffic volumes								
On-net calls	BH Erl	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – outgoing on transit level	BH Erl	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – incoming on transit level	BH Erl	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Packet data traffic volumes								
Year total up-link (CDMA-data)	BH Erl	0	0	0	0	0	0	0
Year total down-link (CDMA-data)	BH Erl	0	0	0	0	0	0	0
Packet data traffic volumes								
Year total up-link (CDMA-data)	BH Mbytes	0	0	0	0	0	0	0
Year total down-link (CDMA-data)	BH Mbytes	0	0	0	0	0	0	0
Voice traffic volumes								
On-net calls	BHCA	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – outgoing on transit level	BHCA	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Interconnection calls – incoming on transit level	BHCA	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Demand – Calculation

		Volume
Routing matrix (voice services)		
		Annual voice traffic [minutes]
On-net calls	minutes	168 216 578
Interconnection calls – outgoing on local level	minutes	27 809 617
Interconnection calls – outgoing on transit level	minutes	18 097 522
Interconnection calls – incoming on local level	minutes	14 839 911
Interconnection calls – incoming on transit level	minutes	41 169 272
Interconnection calls – transit on local level	minutes	6 813 178
Interconnection calls – international outgoing calls	minutes	1 650 812
Interconnection calls – international incoming calls	minutes	7 571 917
Other voice service	minutes	0
Total weighted service volumes	minutes	**286 168 808**

Routing matrix (data services)		
		Annual data traffic [Gbytes]
Annual traffic - Internet access services	Gbytes	481 311 157
Annual traffic - DTV services	Gbytes	105 626 850
Total weighted service volumes	Gbytes	**586 938 007**
Annual traffic - TDM leased lines national	Gbytes	31
Annual traffic - TDM leased lines international	Gbytes	35
Total weighted service volumes	Gbytes	**66**
Annual traffic - Data transmission end to end national	Gbytes	3 676 488
Annual traffic - Data transmission end to end international	Gbytes	11 076 987
Annual traffic - Data transmission local	Gbytes	4 411 893
Annual traffic - Data transmission backhaul	Gbytes	1 782
Annual traffic - Data transmission trunk	Gbytes	13 949 865
Total weighted service volumes	Gbytes	**33 117 016**

Projection – Structure

Demand group	Current time	Year						
		2017	2018	2019	2020	2021	2022	2023
Traffic Projection	0	0	1	2	3	4	5	6
Subscribers - voice services		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Subscribers - Internet access services		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Voice traffic		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Voice and data traffic		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Subscribers - voice services	0	0	0	0	0	0	0	0
Subscribers - Internet access services	0	0	0	0	0	0	0	0
Voice traffic	0	0	0	0	0	0	0	0
Voice and data traffic	0	0	0	0	0	0	0	0

Service demand growth								
		0	1	2	3	4		
		0,00	0,04	0,08	0,25	0,50	1,00	2,00
		Current time	2 weeks ahead	1 month ahead	3 months ahead	6 months ahead	1 year ahead	2 years ahead
Subscribers - voice services	2	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Subscribers - Internet access services	3	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Voice traffic	4	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Voice and data traffic	5	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Service demand growth								
		0	1	2	3	4		
		0,00	0,04	0,08	0,25	0,50	1,00	2,00
		Current time	2 weeks ahead	1 month ahead	3 months ahead	6 months ahead	1 year ahead	2 years ahead
Subscribers - voice services	2	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Subscribers - Internet access services	3	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Voice traffic	4	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Voice and data traffic	5	1,00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Headroom allowance

Network element type	Headroom allowance	Operational allowance
MDF	100%	0%
ODF	100%	0%
MSAN - subscriber card - data services	100%	0%
MSAN - subscriber card - voice services	100%	0%
MSAN - voice processing elements	100%	0%
MSAN - trunking cards	100%	0%
OLT - subscriber card - data services	100%	0%
OLT - trunking cards	100%	0%
Ethernet switch - trunking cards	100%	0%
Ethernet switch - switching cards	100%	0%
IP router - trunking cards	100%	0%
IP router - switching cards	100%	0%
Media Gateway (MGW) - switching cards	100%	0%
Media Gateway (MGW) - trunking cards	100%	0%
IMS - voice processing elements	100%	0%
IMS - subscriber serving elements	100%	0%
Softswitch	100%	0%
Billing hardware and software	100%	0%
AAA server	100%	0%
BRAS	100%	0%
BTS - Macrocell equipment	100%	0%
BTS - Microcell equipment	100%	0%
BSC	100%	0%
MSC Server	100%	0%
MGW trunk port	100%	0%
MGW processor	100%	0%
Ethernet radiolink 20 Mb/s microwave link	100%	0%
HLR	100%	0%

Projection – Calculations

Demand group	Current time	Year						
		2017	2018	2019	2020	2021	2022	2023
Traffic Projection	1	0	1	2	3	4	5	6
Subscribers - voice services		1,10	1,00	0,90	0,81	0,73	0,66	0,59
Subscribers - Internet access services		0,49	1,00	1,10	1,22	1,35	1,49	1,64
Voice traffic		1,68	1,00	0,77	0,61	0,49	0,39	0,31
Voice and data traffic		1,15	1,00	1,44	2,06	2,97	4,29	6,20
Subscribers - voice services	139 142	152 759	139 142	125 528	113 269	102 228	91 928	82 667
Subscribers - Internet access services	246 095	121 185	246 095	271 807	300 154	331 401	366 096	404 423
Voice traffic	286 168 808	480 718 785	286 168 808	219 099 296	175 438 893	140 600 685	112 025 424	89 257 713
Voice and data traffic	620 162 183	714 868 530	620 162 183	890 153 588	1 279 542 019	1 841 414 346	2 660 292 495	3 843 348 376

Service demand grow th								
		0	1	2	3	4		
		0,00	0,04	0,08	0,25	0,50	1,00	2,00
		Current time	2 w eeks ahead	1 month ahead	3 months ahead	6 months ahead	1 year ahead	2 years ahead
Subscribers - voice services	2	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Subscribers - Internet access services	3	1,00	1,00	1,01	1,03	1,05	1,10	1,21
Voice traffic	4	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Voice and data traffic	5	1,00	1,02	1,04	1,11	1,22	1,44	1,87

Access Network Design – Structure

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number	POTS	ISDN-BRA	ISDN-PRA	Internet access services - ADSL 2 Mbit/s with voice	Internet access services - ADSL 2 Mbit/s without voice	Internet access services - ADSL 4 Mbit/s with voice	Internet access services - ADSL 4 Mbit/s without voice	Internet access services - ADSL 8 Mbit/s with voice	Internet access services - ADSL 8 Mbit/s without voice	Internet access services - ADSL 10 Mbit/s with voice	Internet access services - ADSL 10 Mbit/s without voice	Internet access services - ADSL 16 Mbit/s with voice	Internet access services - ADSL 16 Mbit/s without voice	Internet access services - VDSL 20 Mbit/s with voice	Internet access services - VDSL 20 Mbit/s without voice	Internet access services - VDSL 30 Mbit/s with voice	Internet access services - VDSL 30 Mbit/s without voice	Internet access services - VDSL 40 Mbit/s with voice	Internet access services - VDSL 40 Mbit/s without voice	Internet access services - VDSL 50 Mbit/s with voice	Internet access services - VDSL 50 Mbit/s without voice	Internet access services - VDSL 60 Mbit/s with voice	Internet access services - VDSL 60 Mbit/s without voice

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number	Services volume																						
					Internet access services - SHDSL 2 Mbit/s with voice	Internet access services - SHDSL 2 Mbit/s without voice	Internet access services - SHDSL 4 Mbit/s with voice	Internet access services - SHDSL 4 Mbit/s without voice	Internet access services - SHDSL 8 Mbit/s with voice	Internet access services - SHDSL 8 Mbit/s without voice	Internet access services - SHDSL 10 Mbit/s with voice	Internet access services - SHDSL 10 Mbit/s without voice	Internet access services - SHDSL 16 Mbit/s with voice	Internet access services - SHDSL 16 Mbit/s without voice	Internet access services - GPON 50 Mbit/s without voice	Internet access services - GPON 50 Mbit/s with voice	Internet access services - GPON 75 Mbit/s without voice	Internet access services - GPON 75 Mbit/s with voice	Internet access services - GPON 100 Mbit/s without voice	Internet access services - GPON 100 Mbit/s with voice	Internet access services - P2P 50 Mbit/s without voice	Internet access services - P2P 50 Mbit/s with voice	Internet access services - P2P 75 Mbit/s without voice	Internet access services - P2P 75 Mbit/s with voice	Internet access services - P2P 100 Mbit/s without voice	Internet access services - P2P 100 Mbit/s with voice	Digital television	Total lines

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number	Leased lines volume																																		
					TDM leased lines national				TDM leased lines international				Data transmission end to end national									Data transmission end to end international									Data transmission local								
					TDM leased lines up to 2Mbit/s	TDM leased lines 34 Mbit/s	TDM leased lines STM-1	TDM leased lines STM-4	TDM leased lines up to 2Mbit/s	TDM leased lines 34 Mbit/s	TDM leased lines STM-1	TDM leased lines STM-4	Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s	Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s	Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number				MDF					MDF					Subscriber cards							
					Number of copper lines	Number of fiber P2P lines	Number of fiber GPON lines	Type 1	Type 2	Type 3	Type 4	Type 5	Type 1	Type 2	Type 3	Type 4	Type 5	Subscriber cards - Type 1 - ADSL	Subscriber cards - Type 2 - SHDSL	Subscriber cards - Type 3 - VDSL	Subscriber cards - Type 4 - POTS	Subscriber cards - Type 5 - ISDN - BRA	Voice BHCA	Voice Mbit/s	Data Mbit/s

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number	MSAN			MSAN					MSAN					MSAN			ODF					ODF				
					Optical module - SFP/Xenpack	Trunking card	Subscriber cards	Chassis - Type 1	Chassis - Type 2	Chassis - Type 3	Chassis - Type 4	Chassis - Type 5	Chassis - Type 1	Chassis - Type 2	Chassis - Type 3	Chassis - Type 4	Chassis - Type 5	Chassis	Optical module - SFP/Xenpack	Trunking card	Type 1	Type 2	Type 3	Type 4	Type 5	Type 1	Type 2	Type 3	Type 4	Type 5

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number	Voice	Data	OLT dimensioning					Voice	Data	Access Ethernet Switch dimensioning					Gbit/s
					Mbit/s	Mbit/s	Chassis - Type 1	Subscriber cards - Type 1 - GPON	Trunking card - Type 1	Optical module - 10GE Type 1	Optical module - PON	Mbit/s	Mbit/s	Chassis - Type 1	Subscriber cards - Type 1 - P2P	Trunking card - Type 1	Optical module - Trunking card	Optical module - Subscriber cards	

Number	Access Node (AN) name	Geotype (urban, suburban, rural)	Numbering Zone (NZ) number	Transit Zone (TZ) number	DWDM in AN				DWDM in AN				DWDM in AN		DWDM in AN	
					Trunking card - 10GE - Type 1	Trunking card - 10GE - Type 2	Trunking card - 100GE - Type 3	Trunking card - 100GE - Type 4	Trunking card - 10GE - Type 1	Trunking card - 10GE - Type 2	Trunking card - 100GE - Type 3	Trunking card - 100GE - Type 4	Chassis - Type 1	Chassis - Type 2	Chassis - Type 1	Chassis - Type 2

Core Node Design – Structure

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	Services																							
				POTS	ISDN-BRA	ISDN-PRA	Internet access services - ADSL 2 Mbit/s with voice	Internet access services - ADSL 2 Mbit/s without voice	Internet access services - ADSL 4 Mbit/s with voice	Internet access services - ADSL 4 Mbit/s without voice	Internet access services - ADSL 8 Mbit/s with voice	Internet access services - ADSL 8 Mbit/s without voice	Internet access services - ADSL 10 Mbit/s with voice	Internet access services - ADSL 10 Mbit/s without voice	Internet access services - ADSL 16 Mbit/s with voice	Internet access services - ADSL 16 Mbit/s without voice	Internet access services - VDSL 20 Mbit/s with voice	Internet access services - VDSL 20 Mbit/s without voice	Internet access services - VDSL 30 Mbit/s with voice	Internet access services - VDSL 30 Mbit/s without voice	Internet access services - VDSL 40 Mbit/s with voice	Internet access services - VDSL 40 Mbit/s without voice	Internet access services - VDSL 50 Mbit/s with voice	Internet access services - VDSL 50 Mbit/s without voice	Internet access services - VDSL 60 Mbit/s with voice	Internet access services - VDSL 60 Mbit/s without voice

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location																							
				Internet access services - SHDSL 2 Mbit/s with voice	Internet access services - SHDSL 2 Mbit/s without voice	Internet access services - SHDSL 4 Mbit/s with voice	Internet access services - SHDSL 4 Mbit/s without voice	Internet access services - SHDSL 8 Mbit/s with voice	Internet access services - SHDSL 8 Mbit/s without voice	Internet access services - SHDSL 10 Mbit/s with voice	Internet access services - SHDSL 10 Mbit/s without voice	Internet access services - SHDSL 16 Mbit/s with voice	Internet access services - SHDSL 16 Mbit/s without voice	Internet access services - GPON 50 Mbit/s with voice	Internet access services - GPON 50 Mbit/s without voice	Internet access services - GPON 75 Mbit/s with voice	Internet access services - GPON 75 Mbit/s without voice	Internet access services - GPON 100 Mbit/s with voice	Internet access services - GPON 100 Mbit/s without voice	Internet access services - P2P 50 Mbit/s with voice	Internet access services - P2P 50 Mbit/s without voice	Internet access services - P2P 75 Mbit/s with voice	Internet access services - P2P 75 Mbit/s without voice	Internet access services - P2P 100 Mbit/s with voice	Internet access services - P2P 100 Mbit/s without voice	Digital television

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	TDM leased lines national				TDM leased lines international				Data transmission end to end national								Data transmission end to end international							
				TDM leased lines up to 2Mbit/s	TDM leased lines 34 Mbit/s	TDM leased lines STM-1	TDM leased lines STM-4	TDM leased lines up to 2Mbit/s	TDM leased lines 34 Mbit/s	TDM leased lines STM-1	TDM leased lines STM-4	Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s	Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	Data transmission backhaul									Data transmission trunk								Traffic aggregated and switched by Edge Ethernet Switches [Gbit/s]			
				Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s	Data transmission 2 Mbit/s	Data transmission 10 Mbit/s	Data transmission 100 Mbit/s	Data transmission 200 Mbit/s	Data transmission 500 Mbit/s	Data transmission 1 Gbit/s	Data transmission 2 Gbit/s	Data transmission 5 Gbit/s	Data transmission 10 Gbit/s	MSAN - ETH	Tx - ETH edge	ETH edge - IP local	IP local - IP core

Edge Ethernet Switches dimensioning - Backhaul transmission

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	Backhaul transmission dimensioning				ETH switches - minimal (topology)	Access Nodes - ETH	ETH - ETH	Throughput (Gbit/s)	GE	10GE	10GE	10GE	10GE	10GE	1GE	1GE	1GE	1GE				
				Throughput generated by MSANs [Gbit/s]	Throughput generated by services [Gbit/s]	Input throughput of Edge Ethernet Switch [Gbit/s]	Number of ETH - out	Services - ETH				Ports GE	Ports 10GE	Trunking cards - 10GE - Type 3	Trunking cards - 10GE - Type 4	Optical module - SR	Optical module - LR	Trunking cards - GE - Type 1	Trunking cards - GE - Type 2	Optical module - SR	Optical module - LR	Switching cards	Chassis 1	Chassis 2	Chassis 3

Edge Ethernet Switches dimensioning - Aggregation of traffic from backhaul

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	ETH switches - minimal (topology)	ETH - ETH	ETH - IP	Throughput (Gbit/s)	GE	10GE	10GE	10GE	10GE	10GE	1GE	1GE	1GE	1GE			
								Ports GE	Ports 10GE	Trunking cards - 10GE - Type 3	Trunking cards - 10GE - Type 4	Optical module - SR	Optical module - LR	Trunking cards - GE - Type 1	Trunking cards - GE - Type 2	Optical module - SR	Optical module - LR	Switching cards	Chassis 1	Chassis 2	Chassis 3

Local Nodes (LN) dimensioning

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	Gbit/s	ports	ERL	Gbit/s	GE	E1	Gbit/s	Gbit/s	GE	ERL	Gbit/s	Gbit/s	ERL	Gbit/s	Gbit/s	Gbit/s	Gbit/s	1GE	1GE	10GE	10GE	1GE	1GE	10GE	10GE	Switching cards	Chassis 1	Chassis 2	Chassis 3
				ETH - LE	ETH - LE	LN - MGW	LN - MGW	LN-MGW	MGW - POI	LN - peering	LN - peering	LN - peering	LN - LN	LN - LN	LN - LN	LN - TN	LN - TN	LN - LN - out	LN - TN - out	LN - TN - in	Optical module - SR	Optical module - LR	Optical module - SR	Optical module - LR	Trunking cards - GE - Type 1	Trunking cards - GE - Type 2	Trunking cards - 10GE - Type 3	Trunking cards - 10GE - Type 4				

MGW dimensioning

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	GE	1GE	E1	E1	STM-1	STM-4	
				Optical module - SR	1GE - 2p	Switching cards - Type 1	Trunking card - Type 1	Trunking card - Type 2	Trunking card - Type 3	Trunking card - Type 4	Chassis - Type 1	Chassis - Type 2

Core Ethernet Switches dimensioning

10GE	10GE	10GE	10GE	10GE			
Average throughput of Local Node [Gbit/s]	Ports 10GE	Trunking card - Type 3	Trunking card - Type 4	Optical module - SR	Optical module - LR	Switching cards	Chassis 1	Chassis 2	Chassis 3

MGW dimensioning

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	lines	ERL	Gbit/s	GE	E1	Gbit/s	Gbit/s	Gbit/s	Gbit/s	10GE	Gbit/s	Gbit/s	10GE	10GE	10GE	10GE					GE	1GE	E1	E1	STM-1	STM-4		
				Voice	TN - MGW	TN - MGW	TN - MGW	MGW - POI	TN - peering	TN - peering	TN - peering	TN - peering	TN - peering	TN - TN	TN - TN	TN-TN	Optical module - SR	Optical module - LR	Trunking cards - 10GE - Chassis - Type 1	Trunking cards - 10GE - Chassis - Type 2	Switching cards - Chassis - Type 1	Switching cards - Chassis - Type 2	Chassis 1	Chassis 2	Optical module - SR	1GE - 2p	Switching cards - Type 1	Trunking card - Type 1	Trunking card - Type 2	Trunking card - Type 3	Trunking card - Type 4	Chassis - Type 1	Chassis - Type 2

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	DWDM in LN										DWDM in TN									
				Gbit/s	DWDM in LN				DWDM in LN				DWDM in LN		DWDM in LN		Gbit/s	DWDM in TN				DWDM in TN				DWDM in TN		DWDM in TN	
					Trunking card - 10GE - Type 1	Trunking card - 10GE - Type 2	Trunking card - 100GE - Type 3	Trunking card - 100GE - Type 4	Trunking card - 10GE - Type 1	Trunking card - 10GE - Type 2	Trunking card - 100GE - Type 3	Trunking card - 100GE - Type 4	Chassis - Type 1	Chassis - Type 2	Chassis - Type 1	Chassis - Type 2		Trunking card - 10GE - Type 1	Trunking card - 10GE - Type 2	Trunking card - 100GE - Type 3	Trunking card - 100GE - Type 4	Trunking card - 10GE - Type 1	Trunking card - 10GE - Type 2	Trunking card - 100GE - Type 3	Trunking card - 100GE - Type 4	Chassis - Type 1	Chassis - Type 2	Chassis - Type 1	Chassis - Type 2

Edge Ethernet Switches dimensioning - Backhaul transmission

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	Chassis - Type 1	Chassis - Type 2	Chassis - Type 3	Switching cards - Type 1	Trunking cards - GE - Type 1	Trunking cards - GE - Type 2	Trunking cards - 10GE - Type 3	Trunking cards - 10GE - Type 4	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	Optical module - XFP - Type 1 - SR - (Short Range)	Optical module - XFP - Type 2 - LR (Long Range)	Optical module - Xenpack - Type 1 - SR - (Short Range)	Optical module - Xenpack - Type 2 - LR (Long Range)

Core Ethernet Switches dimensioning

Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	Chassis - Type 1 (Catalyst 6504)	Chassis - Type 2 (Catalyst 6506)	Chassis - Type 3 (Catalyst 6509)	Switching cards - Type 1	Trunking cards - GE - Type 1	Trunking cards - GE - Type 2	Trunking cards - 10GE - Type 3	Trunking cards - 10GE - Type 4	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	Optical module - XFP - Type 1 - SR - (Short Range)	Optical module - XFP - Type 2 - LR (Long Range)	Optical module - Xenpack - Type 1 - SR - (Short Range)	Optical module - Xenpack - Type 2 - LR (Long Range)

Local Nodes (LN) dimensioning

Chassis - Type 1 (Cisco 7604)	Chassis - Type 2 (Cisco 7606)	Chassis - Type 3 (Cisco 7609)	Switching cards - Type 1	Trunking cards - GE - Type 1	Trunking cards - GE - Type 2	Trunking cards - 10GE - Type 3	Trunking cards - 10GE - Type 4	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	Optical module - XFP - Type 1 - SR - (Short Range)	Optical module - XFP - Type 2 - LR (Long Range)	Optical module - Xenpack - Type 1 - SR - (Short Range)	Optical module - Xenpack - Type 2 - LR (Long Range)

				Transit Nodes dimensioning								DWDM						MGW								
Numbering Zone (NZ) number	Transit Zone (TZ) number	cess Node (A	Transit Node (TN) location	Chassis - Type 1	Chassis - Type 2	Switching cards - Chassis - Type 1	Switching cards - Chassis - Type 2	Trunking cards - 10GE - Chassis - Type 1 (Cisco 12406)	Trunking cards - 10GE - Chassis - Type 2 (CRS-16/S)	Optical module - Xenpack - Type 1 - SR - (Short Range)	Optical module - Xenpack - Type 2 - LR (Long Range)	Chassis - Type 1	Chassis - Type 2	Trunking cards - 10GE - Type 1	Trunking cards - 10GE - Type 2	Trunking cards - 100GE - Type 3	Trunking cards - 100GE - Type 4	Chassis - Type 1	Chassis - Type 2	Switching cards - Type 1	Trunking cards - GE - Type 1	Trunking card - Type 1	Trunking card - Type 2	Trunking card - Type 3	Trunking card - Type 4	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range)

Other Elements Design – Structure

IMS specification		
Volume of BHE		
BHCA		
Subscribers		
IMS - Main unit / rack		
IMS - Service frame		
IMS - Service frame - Type 1		
IMS - Service card - Type 1 - CSC (iCG9815 UPBA)		
IMS - Service card - Type 2 - UGC (UGV3200 UPBA)	ERL	
IMS - Service card - Type 3 - ATS (ATS9900 UPBA)	subscribers	
IMS - Service card - Type 4 - CSCF / MRCF (CSC3300 UPBA)	subscribers	
IMS - Service card - Type 5 - MRFP1	ERL	
IMS - Service card - Type 6 - MRFP2	ERL	
IMS - Service frame - Type 2 - HSS9820		
IMS - Service card - Type 1 - HSS control		
IMS - Service card - Type 2 - HSS USCDB		
IMS - Service card - Type 2 - HSS DISKAP		
Soft switch		
Main unit / rack - Type 1		
Expansion unit - Type 1		
Internet subscribers		
AAA server		
BRAS		

Ducts and fiber cables – structure

Lp.	Cost category type		AN - LN Urban	AN - LN Suburban	AN - LN Rural	LN - TN Urban	LN - TN Suburban	LN - TN Rural	TN - TN Urban	TN - TN Suburban	TN - TN Rural	TOTAL
	Length	km										
	Nonlinearity factor	%										
	Physical length	km										
	Fibre number	fibres										
Cable calculation												
A. Infrastructure												
	Trench	km										
	Primary duct - 1 hole	km										
	Primary duct - 2 holes	km										
	Primary duct - 6 holes	km										
	Primary duct - 12 holes	km										
	Primary duct - 24 holes	km										
	Primary duct - 48 and more holes	km										
	Secondary duct – HDPE tube laid in the primary duct	km										
	Secondary duct – HDPE tube laid in the trench	km										
	Manholes	pieces										
B. Ground reconstruction												
	Grass reconstruction	m2										
	Sidewalk reconstruction	m2										
	Asphalt pavement reconstruction	m2										
	Concrete pavement reconstruction	m2										
C. Passages under obstacles												
	Passage under road (up to 15m)	m										
	Passage under road (above 15m)	m										
	Passage under tramway track	m										
	Passage under railway tracks	m										
	Passage under rivers and channel	m										
	Passage under other obstacles	m										
D. Additional works												
	Project works	km										
	Consent of the landowners	pieces										
	Geodetic service	km										
E. Fiber cable												
	Fiber cable – 12 fibers	km										
	Fiber cable – 24 fibers	km										
	Fiber cable – 48 fibers	km										
	Fiber cable – 72 fibers	km										
	Fiber cable – 96 fibers	km										
	Fiber cable – 144 fibers	km										
F. Joints for fiber cables												
	Joint for 12 fibers	pieces										
	Joint for 24 fibers	pieces										
	Joint for 48 fibers	pieces										
	Joint for 72 fibers	pieces										
	Joint for 96 fibers	pieces										
	Joint for 144 fibers	pieces										
	Section measurement	pieces										

Lp.	Cost category type		AN - LN Urban	AN - LN Suburban	AN - LN Rural	LN - TN Urban	LN - TN Suburban	LN - TN Rural	TN - TN Urban	TN - TN Suburban	TN - TN Rural	TOTAL
Ducts and fiber cables statistics												
A. Infrastructure												
	Trench	%										
	Primary duct - 1 hole	%										
	Primary duct - 2 holes	%										
	Primary duct - 6 holes	%										
	Primary duct - 12 holes	%										
	Primary duct - 24 holes	%										
	Primary duct - 48 and more holes	%										
	Secondary duct – HDPE tube laid in the primary duct	%										
	Secondary duct – HDPE tube laid in the trench	%										
	Manholes	%										
B. Ground reconstruction												
	Grass reconstruction	%										
	Sidewalk reconstruction	%										
	Asphalt pavement reconstruction	%										
	Concrete pavement reconstruction	%										
C. Passages under obstacles												
	Passage under road (up to 15m)	%										
	Passage under road (above 15m)	%										
	Passage under tramway track	%										
	Passage under railway tracks	%										
	Passage under rivers and channel	%										
	Passage under other obstacles	%										
D. Additional works												
	Project works	%										
	Consent of the landowners	%										
	Geodetic service	%										
E. Fiber cable												
	Fiber cable – 12 fibers	%										
	Fiber cable – 24 fibers	%										
	Fiber cable – 48 fibers	%										
	Fiber cable – 72 fibers	%										
	Fiber cable – 96 fibers	%										
	Fiber cable – 144 fibers	%										
F. Joints for fiber cables												
	Joint for 12 fibers	%										
	Joint for 24 fibers	%										
	Joint for 48 fibers	%										
	Joint for 72 fibers	%										
	Joint for 96 fibers	%										
	Joint for 144 fibers	%										
	Section measurement	%										

Revaluation – structure

Ref.	HCC name	Unit	Volume	Unit price total (GEL)	GRC value (GEL)	Annualized cost (GEL)					
						Annuity method	Modified annuity method	Tilted annuity method	Modified tilted annuity method	Straight-line method	Chosen method
Infrastructure											
0	Trench	km									
0	Primary duct - 1 hole	km									
0	Primary duct - 2 holes	km									
0	Primary duct - 6 holes	km									
0	Primary duct - 12 holes	km									
0	Primary duct - 24 holes	km									
0	Primary duct - 48 and more holes	km									
0	Secondary duct – HDPE tube laid in the primary duct	km									
0	Secondary duct – HDPE tube laid in the trench	km									
0	Manholes	pieces									
Ground reconstruction											
0	Grass reconstruction	m2									
0	Sidewalk reconstruction	m2									
0	Asphalt pavement reconstruction	m2									
0	Concrete pavement reconstruction	m2									
Passages under obstacles											
0	Passage under road (up to 15m)	pieces									
0	Passage under road (above 15m)	pieces									
0	Passage under tramway track	pieces									
0	Passage under railway tracks	pieces									
0	Passage under rivers and channel	pieces									
0	Passage under other obstacles	pieces									
Additional works											
0	Project works	km									
0	Consent of the landowners	pieces									
0	Geodetic service	km									
Copper cables											
0	Copper cables - Type 1	km									
0	Copper cables - Type 2	km									
0	Copper cables - Type 3	km									
0	Copper cables - Type 4	km									
0	Copper cables - Type 5	km									
0	Copper cables - Type 6	km									
0	Copper cables - Type 7	km									
0	Copper cables - Type 8	km									
0	Copper cables - Type 9	km									
0	Copper cables - Type 10	km									
Joints for copper cables											
0	Joint for copper cables - Type 1	pieces									
0	Joint for copper cables - Type 2	pieces									
0	Joint for copper cables - Type 3	pieces									
0	Joint for copper cables - Type 4	pieces									
0	Joint for copper cables - Type 5	pieces									
0	Joint for copper cables - Type 6	pieces									
0	Joint for copper cables - Type 7	pieces									
0	Joint for copper cables - Type 8	pieces									
0	Joint for copper cables - Type 9	pieces									
0	Joint for copper cables - Type 10	pieces									

Ref.	HCC name	Unit	Volume	Unit price total (GEL)	GRC value (GEL)	Annualized cost (GEL)					
						Annuity method	Modified annuity method	Tilted annuity method	Modified tilted annuity method	Straight-line method	Chosen method
Copper cabinets											
0	Copper cabinets - Type 1	pieces									
0	Copper cabinets - Type 2	pieces									
0	Copper cabinets - Type 3	pieces									
0	Copper cabinets - Type 4	pieces									
0	Copper cabinets - Type 5	pieces									
Copper distribution points											
0	Copper distribution points - Type 1	pieces									
0	Copper distribution points - Type 2	pieces									
0	Copper distribution points - Type 3	pieces									
0	Copper distribution points - Type 4	pieces									
0	Copper distribution points - Type 5	pieces									
Fiber cable											
0	Fiber cable – 12 fibers	km									
0	Fiber cable – 24 fibers	km									
0	Fiber cable – 48 fibers	km									
0	Fiber cable – 72 fibers	km									
0	Fiber cable – 96 fibers	km									
0	Fiber cable – 144 fibers	km									
Joints for fiber cables											
0	Joint for 12 fibers	pieces									
0	Joint for 24 fibers	pieces									
0	Joint for 48 fibers	pieces									
0	Joint for 72 fibers	pieces									
0	Joint for 96 fibers	pieces									
0	Joint for 144 fibers	pieces									
Fiber cabinets											
0	Fiber cabinets - Type 1	pieces									
0	Fiber cabinets - Type 2	pieces									
0	Fiber cabinets - Type 3	pieces									
0	Fiber cabinets - Type 4	pieces									
0	Fiber cabinets - Type 5	pieces									
Fiber distribution points											
0	Fiber distribution points - Type 1	pieces									
0	Fiber distribution points - Type 2	pieces									
0	Fiber distribution points - Type 3	pieces									
0	Fiber distribution points - Type 4	pieces									
0	Fiber distribution points - Type 5	pieces									
Other access network equipment											
0	Other access network equipment - Type 1	km									
0	Other access network equipment - Type 2	km									
0	Other access network equipment - Type 3	km									
0	Other access network equipment - Type 4	km									
0	Other access network equipment - Type 5	km									
MDF											
0	MDF - Type 1	pieces									
0	MDF - Type 2	pieces									
0	MDF - Type 3	pieces									
0	MDF - Type 4	pieces									
0	MDF - Type 5	pieces									
ODF											
0	ODF - Type 1	pieces									
0	ODF - Type 2	pieces									
0	ODF - Type 3	pieces									
0	ODF - Type 4	pieces									
0	ODF - Type 5	pieces									
MSAN											
0	Chassis - Type 1	pieces									
0	Chassis - Type 2	pieces									
0	Chassis - Type 3	pieces									
0	Chassis - Type 4	pieces									
0	Chassis - Type 5	pieces									
0	Subscriber cards - Type 1 - ADSL	pieces									
0	Subscriber cards - Type 2 - SHDSL	pieces									
0	Subscriber cards - Type 3 - VDSL	pieces									
0	Subscriber cards - Type 4 - POTS	pieces									
0	Subscriber cards - Type 5 - ISDN - BRA	pieces									
0	Trunking card - Type 1	pieces									
0	Optical module - Trunking card	pieces									
OLT											
0	Chassis - Type 1	pieces									
0	Subscriber cards - Type 1 - GPON	pieces									
0	Trunking card - Type 1	pieces									
0	Optical module - 10GE Type 1	pieces									
0	Optical module - PON	pieces									
0	ONT	pieces									

Ref.	HCC name	Unit	Volume	Unit price total (GEL)	GRC value (GEL)	Annualized cost (GEL)					
						Annuity method	Modified annuity method	Tilted annuity method	Modified tilted annuity method	Straight-line method	Chosen method
I. Access Ethernet switches specification											
1	Chassis - Type 1	pieces									
2	Subscriber cards - Type 1 - P2P	pieces									
3	Trunking cards - GE - Type 1	pieces									
4	Optical module - Subscriber cards	pieces									
5	Optical module - Trunking card	pieces									
Edge Ethernet Switch											
0	Chassis - Type 1	pieces									
0	Chassis - Type 2	pieces									
0	Chassis - Type 3	pieces									
0	Switching cards - Type 1	pieces									
0	Trunking cards - GE - Type 1	pieces									
0	Trunking cards - GE - Type 2	pieces									
0	Trunking cards - 10GE - Type 3	pieces									
0	Trunking cards - 10GE - Type 4	pieces									
0	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range	pieces									
0	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	pieces									
0	Optical module - XFP - Type 1 - SR - (Short Range)	pieces									
0	Optical module - XFP - Type 2 - LR (Long Range)	pieces									
0	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces									
0	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces									
Core Ethernet Switch											
0	Chassis - Type 1 (Catalyst 6504)	pieces									
0	Chassis - Type 2 (Catalyst 6506)	pieces									
0	Chassis - Type 3 (Catalyst 6509)	pieces									
0	Switching cards - Type 1	pieces									
0	Trunking cards - GE - Type 1	pieces									
0	Trunking cards - GE - Type 2	pieces									
0	Trunking cards - 10GE - Type 3	pieces									
0	Trunking cards - 10GE - Type 4	pieces									
0	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range	pieces									
0	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	pieces									
0	Optical module - XFP - Type 1 - SR - (Short Range)	pieces									
0	Optical module - XFP - Type 2 - LR (Long Range)	pieces									
0	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces									
0	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces									
Local Node - IP router											
0	Chassis - Type 1 (Cisco 7604)	pieces									
0	Chassis - Type 2 (Cisco 7606)	pieces									
0	Chassis - Type 3 (Cisco 7609)	pieces									
0	Switching cards - Type 1	pieces									
0	Trunking cards - GE - Type 1	pieces									
0	Trunking cards - GE - Type 2	pieces									
0	Trunking cards - 10GE - Type 3	pieces									
0	Trunking cards - 10GE - Type 4	pieces									
0	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range	pieces									
0	Optical module - SFP/Xenpack - Type 2 - LR (Long Range)	pieces									
0	Optical module - XFP - Type 1 - SR - (Short Range)	pieces									
0	Optical module - XFP - Type 2 - LR (Long Range)	pieces									
0	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces									
0	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces									
Transit Node - IP router											
0	Chassis - Type 1	pieces									
0	Chassis - Type 2	pieces									
0	Switching cards - Chassis - Type 1	pieces									
0	Switching cards - Chassis - Type 2	pieces									
0	Trunking cards - 10GE - Chassis - Type 1 (Cisco 12406)	pieces									
0	Trunking cards - 10GE - Chassis - Type 2 (CRS-16/S)	pieces									
0	Optical module - Xenpack - Type 1 - SR - (Short Range)	pieces									
0	Optical module - Xenpack - Type 2 - LR (Long Range)	pieces									

Ref.	HCC name	Unit	Volume	Unit price total (GEL)	GRC value (GEL)	Annualized cost (GEL)					
						Annuity method	Modified annuity method	Tilted annuity method	Modified tilted annuity method	Straight-line method	Chosen method
DWDM											
0	Chassis - Type 1	pieces									
0	Chassis - Type 2	pieces									
0	Trunking cards - 10GE - Type 1	pieces									
0	Trunking cards - 10GE - Type 2	pieces									
0	Trunking cards - 100GE - Type 3	pieces									
0	Trunking cards - 100GE - Type 4	pieces									
MGW											
0	Chassis - Type 1	pieces									
0	Chassis - Type 2	pieces									
0	Switching cards - Type 1	pieces									
0	Trunking cards - GE - Type 1	pieces									
0	Trunking card - Type 1	pieces									
0	Trunking card - Type 2	pieces									
0	Trunking card - Type 3	pieces									
0	Trunking card - Type 4	pieces									
0	Optical module - SFP/Xenpack - Type 1 - SR - (Short Range	pieces									
IMS											
0	IMS - Main unit / rack	pieces									
0	IMS - Service frame	pieces									
0	IMS - Service card - Type 1 - CSC (iCG9815 UPBA)	pieces									
0	IMS - Service card - Type 2 - UGC (UGV3200 UPBA)	pieces									
0	IMS - Service card - Type 3 - ATS (ATS9900 UPBA)	pieces									
0	IMS - Service card - Type 4 - CSCF / MRCF (CSC3300 UPBA)	pieces									
0	IMS - Service card - Type 5 - MRFP1	pieces									
0	IMS - Service card - Type 6 - MRFP2	pieces									
0	IMS - Service card - Type 1 - HSS control	pieces									
0	IMS - Service card - Type 2 - HSS USCDB	pieces									
0	IMS - Service card - Type 2 - HSS DISKAP	pieces									
0	Licenses - Type 1 - CSC (iCG9815 UPBA)	pieces									
0	Licenses - Type 2 - UGC (UGV3200 UPBA)	pieces									
0	Licenses - Type 3 - ATS (ATS9900 UPBA)	pieces									
0	Licenses - Type 4 - CSCF / MRCF (CSC3300 UPBA)	pieces									
0	Licenses - Type 5 - MRFP1	pieces									
0	Licenses - Type 6 - MRFP2	pieces									
0	Licenses - HSS9820	pieces									
Soft switch											
0	Main unit / rack - Type 1	pieces									
0	Expansion unit - Type 1	pieces									
AAA server											
0	AAA server	pieces									
BRAS											
0	BRAS	pieces									
Billing System											
0	Billing System - Voice services	pieces									
Site											
0	Macrocell: tower and site preparation	pieces									
0	Microcell: site preparation	pieces									
0	Picocell: site preparation	pieces									
0	Stand-alone transmission radiolink: tower and site prepa	pieces									
BTS											
0	Macrocell: equipment (omni sector)	pieces									
0	Macrocell: equipment (2 sector)	pieces									
0	Macrocell: equipment (3 sector)	pieces									
0	Microcell	pieces									
0	Picocell	pieces									
Ethernet Radiolink											
0	Ethernet radiolink 20 Mb/s microwave link	pieces									
0	Ethernet radiolink 100 Mb/s microwave link	pieces									
0	Ethernet radiolink 150 Mb/s microwave link	pieces									
0	Ethernet radiolink 200 Mb/s microwave link	pieces									
BSC/RNC											
0	BSC: base unit	pieces									
0	BSC: expansion units	pieces									
MSC											
0	MSS: basic unit and software	pieces									
0	MSS: processor extension	pieces									
0	MGW: basic unit and software	pieces									
Other Network											
0	HLR: base unit	pieces									
License and frequency fee											
0	Concession right - CDMA (total value)	pieces									

Mark-ups – Structure

Ref.	HCC name	GRC value (GEL)	Annualized cost (GEL)	Cost rates			Yearly cost (GEL)
				Markup A.	Markup C.	Markup D.	
Infrastructure							
0	Trench						
0	Primary duct - 1 hole						
0	Primary duct - 2 holes						
0	Primary duct - 6 holes						
0	Primary duct - 12 holes						
0	Primary duct - 24 holes						
0	Primary duct - 48 and more holes						
0	Secondary duct – HDPE tube laid in the primary duct						
0	Secondary duct – HDPE tube laid in the trench						
0	Manholes						
Ground reconstruction							
0	Grass reconstruction						
0	Sidew alk reconstruction						
0	Asphalt pavement reconstruction						
0	Concrete pavement reconstruction						
Passages under obstacles							
0	Passage under road (up to 15m)						
0	Passage under road (above 15m)						
0	Passage under tramw ay track						
▪ ▪ ▪ ▪							
0	Ethernet radiolink 100 Mb/s microw ave link						
0	Ethernet radiolink 150 Mb/s microw ave link						
0	Ethernet radiolink 200 Mb/s microw ave link						
BSC/RNC							
0	BSC: base unit						
0	BSC: expansion units						
MSC							
0	MSS: basic unit and softw are						
0	MSS: processor extension						
0	MGW: basic unit and softw are						
Other Netw ork							
0	HLR: base unit						
License and frequency fee							
0	Concession right - CDMA (total value)						

HCC – NC – structure

Ref.	HCC name	Yearly cost (GEL)		Allocation on network components														
				Access Node (AN)	Local Node (LN)	Transit Node (TN)	Transmission - AN - LN	Transmission - LN - LN	Transmission - LN - TN	Transmission - LN - POI	Transmission - TN - TN	Transmission - TN - POI	MGW	IMS	Softswitch	Billing system	AAA server	BRAS
Copper cables																		
0	Copper cables - Type 1	0																
0	Copper cables - Type 2	0																
0	Copper cables - Type 3	0																
0	Copper cables - Type 4	0																
0	Copper cables - Type 5	0																
0	Copper cables - Type 6	0																
0	Copper cables - Type 7	0																
0	Copper cables - Type 8	0																
0	Copper cables - Type 9	0																
0	Copper cables - Type 10	0																
Copper cabinets		0																
0	Copper cabinets - Type 1	0																
0	Copper cabinets - Type 2	0																
0	Copper cabinets - Type 3	0																
0	Copper cabinets - Type 4	0																
0	Copper cabinets - Type 5	0																
Copper distribution points		0																
0	Copper distribution points - Type 1	0																
0	Copper distribution points - Type 2	0																
0	Copper distribution points - Type 3	0																
0	Copper distribution points - Type 4	0																
0	Copper distribution points - Type 5	0																
Fiber cable		0																
0	Fiber cable – 12 fibers	0																
0	Fiber cable – 24 fibers	0																
0	Fiber cable – 48 fibers	0																
0	Fiber cable – 72 fibers	0																
0	Fiber cable – 96 fibers	0																
0	Fiber cable – 144 fibers	0																
Joints for fiber cables		0																
0	Joint for 12 fibers	0																
0	Joint for 24 fibers	0																
0	Joint for 48 fibers	0																
0	Joint for 72 fibers	0																
0	Joint for 96 fibers	0																
0	Joint for 144 fibers	0																
	▪▪▪▪▪																	
0	BRAS	0																
Billing System		0																
0	Billing System - Voice services	0																
Site		0																
0	Macrocell: tower and site preparation	0																
0	Microcell: site preparation	0																
0	Picocell: site preparation	0																
0	Stand-alone transmission radiolink: tower and site preparation	0																
BTS		0																
0	Macrocell: equipment (omni sector)	0																
0	Macrocell: equipment (2 sector)	0																
0	Macrocell: equipment (3 sector)	0																
0	Microcell	0																
0	Picocell	0																
Ethernet Radiolink		0																
0	Ethernet radiolink 20 Mb/s microwave link	0																
0	Ethernet radiolink 100 Mb/s microwave link	0																
0	Ethernet radiolink 150 Mb/s microwave link	0																
0	Ethernet radiolink 200 Mb/s microwave link	0																
BSC/RNC		0																
0	BSC: base unit	0																
0	BSC: expansion units	0																
MSC		0																
0	MSS: basic unit and software	0																
0	MSS: processor extension	0																
0	MGW: basic unit and software	0																
Other Network		0																
0	HLR: base unit	0																
License and frequency fee		0																
0	Concession right - CDMA (total value)	0																
	Total Network Component cost (GEL)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HCC – NC – Calculation

Ref.	HCC name	Yearly cost (GEL)
	Infrastructure costs	21 315 093
	Fiber cables + fiber equipment	27 705 315
	Netw ork Equipment	52 200 131
	Total Costs	101 220 538

Ref.	HCC name	Yearly cost (GEL)	Allocation on network components											
			Access Node (AN)	Local Node (LN)	Transit Node (TN)	Transmission - AN - LN	Transmission - LN - TN	Transmission - TN - TN	MGW	IMS	Softsw itch	Billing system	AAA server	BRAS
	Total Netw ork Component cost (GEL)	101 220 538,39	43 163 151	5 003 330	268 522	38 931 909	8 562 650	1 887 166	469 082	604 625	5 823	2 245 109	72 837	6 333

Access Lines – Structure

Access network per line		Urban copper line	Urban fiber P2P line	Urban fiber GPON line	Rural copper line	Rural fiber P2P line	Rural fiber GPON line	Average copper line	Average fiber P2P line	Average fiber GPON line
Number of lines										
Length per line										
A. Infrastructure										
Trench	km									
Primary duct - 1 hole	km									
....										
B. Ground reconstruction										
Grass reconstruction	m2									
....										
C. Passages under obstacles										
Passage under road (up to 15m)	m									
....										
D. Additional works										
Copper cables										
Copper cables - Type 1	km									
Copper cables - Type 2	km									
....										
Joints for copper cables										
Joint for copper cables - Type 1	pieces									
Joint for copper cables - Type 2	pieces									
....										
Copper cabinets										
Copper cabinets - Type 1	pieces									
....										
Copper distribution points										
Copper distribution points - Type 1	pieces									
....										
Fiber cables										
Fiber cable – 12 fibers	km									
Fiber cable – 24 fibers	km									
....										
Joints for fiber cables										
Joint for 12 fibers	pieces									
Joint for 24 fibers	pieces									
....										
Fiber cabinets										
Fiber cabinets - Type 1	pieces									
Fiber cabinets - Type 2	pieces									
....										
Fiber distribution points										
Fiber distribution points - Type 1	pieces									
....										
Other access network equipment										
Other access netw ork equipment - Type 1	pieces									
....										

Ref.	HCC name	Unit	Volume	Unit price total (GEL)	GRC value (GEL)	Annualized cost (GEL)						
						Annuity method	Modified annuity method	Tilted annuity method	Modified tilted annuity method	Straight-line method	Chosen method	Total unit cost including mark-ups
Infrastructure												
	Trench	km	1	0	0							
	Primary duct - 1 hole	km	1	0	0							
	....											
	....											
Fiber cabinets												
	Fiber cabinets - Type 1	pieces	1	0	0							
	Fiber cabinets - Type 2	pieces	1	0	0							
	Fiber cabinets - Type 3	pieces	1	0	0							
	Fiber cabinets - Type 4	pieces	1	0	0							
	Fiber cabinets - Type 5	pieces	1	0	0							
Fiber distribution points												
	Fiber distribution points - Type 1	pieces	1	0	0							
	Fiber distribution points - Type 2	pieces	1	0	0							
	Fiber distribution points - Type 3	pieces	1	0	0							
	Fiber distribution points - Type 4	pieces	1	0	0							
	Fiber distribution points - Type 5	pieces	1	0	0							
Other access network equipment												
	Other access network equipment - Type 1	km	1	0	0							
	Other access network equipment - Type 2	km	1	0	0							
	Other access network equipment - Type 3	km	1	0	0							
	Other access network equipment - Type 4	km	1	0	0							
	Other access network equipment - Type 5	km	1	0	0							

	HCC Average cost per line per 1 km	Average copper line	Average fiber P2P line	Average fiber GPON line
Infrastructure				
0	Trench			
0	Primary duct - 1 hole			
0	Primary duct - 2 holes			
0	Primary duct - 6 holes			
0	Primary duct - 12 holes			
0	Primary duct - 24 holes			
0	Primary duct - 48 and more holes			
0	Secondary duct – HDPE tube laid in the primary duct			
0	Secondary duct – HDPE tube laid in the trench			
0	Manholes			
Ground reconstruction				
0	Grass reconstruction			
0	Sidew alk reconstruction			
0	Asphalt pavement reconstruction			
	.....			
	.....			
MSAN				
0	Chassis - Type 1			
0	Chassis - Type 2			
0	Chassis - Type 3			
0	Chassis - Type 4			
0	Chassis - Type 5			
0	Subscriber cards - Type 1 - ADSL			
0	Subscriber cards - Type 2 - SHDSL			
0	Subscriber cards - Type 3 - VDSL			
0	Subscriber cards - Type 4 - POTS			
0	Subscriber cards - Type 5 - ISDN - BRA			
0	Trunking card - Type 1			
0	Optical module - Trunking card			
OLT				
0	Chassis - Type 1			
0	Subscriber cards - Type 1 - GPON			
0	Trunking card - Type 1			
0	Optical module - 10GE Type 1			
0	Optical module - PON			
0	ONT			
I. Access Ethernet sw itches specification				
1	Chassis - Type 1			
2	Subscriber cards - Type 1 - P2P			
3	Trunking cards - GE - Type 1			
4	Optical module - Subscriber cards			
5	Optical module - Trunking card			

4. Results

4.1. Service costs

Intro | C12 | Services cost

Service type					Total Network Component costs (GEL)														
	Cost type	Volume	Service unit cost (LARI)	Service unit cost (EUR)	Access Node (AN)	Local Node (LN)	Transit Node (TN)	Transmission - AN - LN	Transmission - LN - LN	Transmission - LN - TN	Transmission - LN - POI	Transmission - TN - TN	Transmission - TN - POI	MGW	IMS	Softswitch	Billing system	AAA server	BRAS
Average unit costs																			
Internet access services	Gbytes	481 311 157	**0,1653**	**0,0549**	34 313 003,9	3 797 360,1	252 420,1	30 907 308,2	0,0	6 645 661,4	0,0	1 780 957,5	0,0	0,0	0,0	4 774,3	1 784 903,7	57 916,8	6 100,2
DTV services	Gbytes	105 626 850	**0,1610**	**0,0535**	7 530 210,9	833 355,3	0,0	6 782 808,9	0,0	1 458 433,4	0,0	0,0	0,0	0,0	0,0	1 047,7	391 708,7	12 710,2	0,0
TDM leased lines national	Gbytes	31	**0,3185**	**0,1059**	4,5	0,5	0,0	4,0	0,0	0,9	0,0	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0
TDM leased lines international	Gbytes	35	**0,2392**	**0,0795**	2,5	0,3	0,0	4,5	0,0	1,0	0,0	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Data transmission end to end national	Gbytes	3 676 488	**0,0902**	**0,0300**	0,0	29 006,1	2 142,3	236 085,0	0,0	50 762,8	0,0	13 603,8	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Data transmission end to end international	Gbytes	11 076 987	**0,0899**	**0,0299**	0,0	87 393,2	3 227,4	711 306,7	0,0	152 944,5	0,0	40 987,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Data transmission local	Gbytes	4 411 893	**0,1616**	**0,0537**	314 526,9	34 808,1	2 570,9	283 308,9	0,0	60 916,8	0,0	0,0	0,0	0,0	0,0	0,0	16 361,1	530,9	55,9
Data transmission backhaul	Gbytes	1 782	**0,0578**	**0,0192**	42,4	28,1	1,0	0,0	0,0	24,6	0,0	0,0	0,0	0,0	0,0	0,0	6,6	0,2	0,0
Data transmission trunk	Gbytes	13 949 865	**0,1090**	**0,0362**	994 495,5	220 118,2	8 128,8	0,0	0,0	192 611,5	0,0	51 617,6	0,0	0,0	0,0	0,0	51 732,0	1 678,6	176,8

4.2. Rentals

NGA based Services	
Duct sharing Cost of one hole per km per month	**[GEL]**
Primary duct - 2 holes	**387.8**
Dark fibre Average cost of one fiber per km per r	**[GEL]**
Average cost of fiber cable per km per	218.2
Average number of fibers in a fiber ca	14.6
Average cost of one fiber per km	**14.9**

NGN based Services Total cost per line per month	[GEL]
TDM leased lines national (both ends in Georgia)	
TDM leased lines up to 2Mbit/s	50,8
TDM leased lines 34 Mbit/s	51,3
TDM leased lines STM-1	184,1
TDM leased lines STM-4	190,1
TDM leased lines international (one end in Georgia)	
TDM leased lines up to 2Mbit/s	25,4
TDM leased lines 34 Mbit/s	25,5
TDM leased lines STM-1	91,5
TDM leased lines STM-4	92,6
Data transmission trunk (from LN to TN and betw een TN)	
Data transmission 2 Mbit/s	0,8
Data transmission 10 Mbit/s	4,1
Data transmission 100 Mbit/s	41,4
Data transmission 200 Mbit/s	82,8
Data transmission 500 Mbit/s	206,9
Data transmission 1 Gbit/s	413,9
Data transmission 2 Gbit/s	827,8
Data transmission 5 Gbit/s	2 069,4
Data transmission 10 Gbit/s	4 138,8