





SCHEDULE 10

PURCHASE ORDER
SUPPLY OF LOCAL EQUIPMENT AND RELATED SERVICES

HOG09080385

Jakarta, 17 September 2009

To :
PT Nokia Siemens Networks
Gd. Menara Mulia Lt 27
Jl. Gatot Subroto 9 – 11
Jakarta 12930

Attn : President Director

Re : Purchase Order of Supply Local Equipment and Related Service for 3G RU10
Upgrade Year 2009 for Kalimantan Region

Dear Sir,

This Purchase Order (the "Order") serves our confirmation to purchase from you and deliver Equipment and Related Services (the "Equipment and Services") for our requirement as stipulated in the 2G BSS and 3G UTRAN Rollout Agreement No. Ref. 008/BC/PROC-01/LOG/2009 dated on March 13th 2009 (the "Rollout Agreement") with the detail schedule (the "Equipment and Services Delivery Period") as attached.

Total price under this Order shall be **IDR 367,375,694.00** (Said : Three hundred sixty seven million three hundred seventy five thousand six hundred ninety four Indonesian Rupiah) exclude 10% VAT, with the detail schedule as follows:



W.D.

This Order contains the following documents which constitutes as integral part thereof (but not limited to):

- Specifications and Configurations of the Equipment and Related Services
- Quantity of Equipment and Related Services required;
- Detailed Equipment and Related Services Supply schedule (see attached schedule);
- Detailed fees for the Equipment and Related Services;
- Specific Sites for each Equipment and Related Services;
- Any agreed variations to the terms and conditions of the Agreement

For late delivery of Equipment and Services based on the Equipment and Services Delivery Period attached in this Order Telkomsel is entitled to impose a Liquidated Damages and rectification of faulty equipment as stipulated in Article 31 of the Rollout Agreement.

The completion of the Equipment and Services will be vindicated by the issuance of Final BAST by Telkomsel.

All terms and conditions not set forth herein in shall refer to the Rollout Agreement and furthermore this Order is valid issuance of invoice for the above-mentioned deliverables.

Sincerely Yours,
On Behalf of Telkomsel,



Andri Wibawanto

Name : Andri Wibawanto
Title : GM BSS Sub System Procurement

W. J.

SCHEDULE 10

**PURCHASE ORDER
SUPPLY OF LOCAL EQUIPMENT AND RELATED SERVICES
HOG09090389**

Jakarta, *17 September 2009*

To :
PT Nokia Siemens Networks
Gd. Menara Mulia Lt 27
Jl. Gatot Subroto 9 – 11
Jakarta 12930

Attn : President Director

Re : Purchase Order of Supply Local Equipment and Related Service for 3G RU10
Upgrade Year 2009 for Sulmaritja Region

Dear Sir,

This Purchase Order (the "Order") serves our confirmation to purchase from you and deliver Equipment and Related Services (the "Equipment and Services") for our requirement as stipulated in the 2G BSS and 3G UTRAN Rollout Agreement No. Ref. 008/BC/PROC-01/LOG/2009 dated on March 13th 2009 (the "Rollout Agreement") with the detail schedule (the "Equipment and Services Delivery Period") as attached.

Total price under this Order shall be **IDR 293,900,772.00** (Said : Two hundred ninety three million nine hundred thousand seven hundred seventy two Indonesian Rupiah) exclude 10% VAT, with the detail schedule as follows:



This Order contains the following documents which constitutes as integral part thereof (but not limited to):

- Specifications and Configurations of the Equipment and Related Services
- Quantity of Equipment and Related Services required;
- Detailed Equipment and Related Services Supply schedule (see attached schedule);
- Detailed fees for the Equipment and Related Services;
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All terms and conditions not set forth herein in shall refer to the Rollout Agreement and furthermore this Order is valid issuance of invoice for the above-mentioned deliverables.

Sincerely Yours,
On Behalf of Telkomsel,



Name : Andri Wibawanto
Title : GM BSS Sub System Procurement

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LAMPIRAN 3

Tabel Konversi DPMO ke Nilai Sigma Berdasarkan
Motorola's 6-Sigma Process [1]

Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO
0,00	933192,80	0,48	846135,77	0,96	705401,48	1,44	523922,18
0,01	931887,88	0,49	843752,35	0,97	701944,03	1,45	519938,81
0,02	930563,38	0,50	841344,75	0,98	698468,21	1,46	515953,44
0,03	929219,12	0,51	838912,94	0,99	694974,27	1,47	511966,47
0,04	927854,96	0,52	836456,94	1,00	691462,46	1,48	507978,31
0,05	926470,74	0,53	833976,75	1,01	687933,05	1,49	503989,36
0,06	925066,30	0,54	831472,39	1,02	684386,30	1,50	500000,00
0,07	923641,49	0,55	828943,87	1,03	680822,49	1,51	496010,64
0,08	922196,16	0,56	826391,22	1,04	677241,89	1,52	492021,69
0,09	920730,16	0,57	823814,46	1,05	673644,78	1,53	488033,53
0,10	919243,34	0,58	821213,62	1,06	670031,45	1,54	484046,56
0,11	917735,56	0,59	818588,75	1,07	666402,18	1,55	480061,19
0,12	916206,68	0,60	815939,87	1,08	662757,27	1,56	476077,82
0,13	914656,55	0,61	813267,06	1,09	659097,03	1,57	472096,83
0,14	913085,04	0,62	810570,35	1,10	655421,74	1,58	468118,63
0,15	911492,01	0,63	807849,80	1,11	651731,73	1,59	464143,61
0,16	909877,33	0,64	805105,48	1,12	648027,29	1,60	460172,16
0,17	908240,86	0,65	802337,46	1,13	644308,75	1,61	456204,69
0,18	906582,49	0,66	799545,81	1,14	640576,43	1,62	452241,57
0,19	904902,08	0,67	796730,61	1,15	636830,65	1,63	448283,21
0,20	903199,52	0,68	793891,95	1,16	633071,74	1,64	444330,00
0,21	901474,67	0,69	791029,91	1,17	629300,02	1,65	440382,31
0,22	899727,43	0,70	788144,60	1,18	625515,83	1,66	436440,54
0,23	897957,68	0,71	785236,12	1,19	621719,52	1,67	432505,07
0,24	896165,32	0,72	782304,56	1,20	617911,42	1,68	428576,28
0,25	894350,23	0,73	779350,05	1,21	614091,88	1,69	424654,57
0,26	892512,30	0,74	776372,71	1,22	610261,25	1,70	420740,29
0,27	890651,45	0,75	773372,65	1,23	606419,87	1,71	416833,84
0,28	888767,56	0,76	770350,00	1,24	602568,11	1,72	412935,58
0,29	886860,55	0,77	767304,91	1,25	598706,33	1,73	409045,88
0,30	884930,33	0,78	764237,50	1,26	594834,87	1,74	405165,13
0,31	882976,80	0,79	761147,93	1,27	590954,12	1,75	401293,67
0,32	880999,89	0,80	758036,35	1,28	587064,42	1,76	397431,89
0,33	878999,52	0,81	754902,91	1,29	583166,16	1,77	393580,13
0,34	876975,60	0,82	751747,77	1,30	579259,71	1,78	389738,75
0,35	874928,06	0,83	748571,10	1,31	575345,43	1,79	385908,12
0,36	872856,85	0,84	745373,09	1,32	571423,72	1,80	382088,58
0,37	870761,89	0,85	742153,89	1,33	567494,93	1,81	378280,48
0,38	868643,12	0,86	738913,70	1,34	563559,46	1,82	374484,17
0,39	866500,49	0,87	735652,71	1,35	559617,69	1,83	370699,98
0,40	864333,94	0,88	732371,11	1,36	555670,00	1,84	366928,26
0,41	862143,43	0,89	729069,10	1,37	551716,79	1,85	363169,35
0,42	859928,91	0,90	725746,88	1,38	547758,43	1,86	359423,57
0,43	857690,35	0,91	722404,68	1,39	543795,31	1,87	355691,25
0,44	855427,70	0,92	719042,69	1,40	539827,84	1,88	351972,71
0,45	853140,94	0,93	715661,15	1,41	535856,39	1,89	348268,27
0,46	850830,05	0,94	712260,28	1,42	531881,37	1,90	344578,26
0,47	848495,00	0,95	708840,31	1,43	527903,17	1,91	340902,97

Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO
1,92	337242,73	2,44	173608,78	2,96	72145,04	3,48	23851,76
1,93	333597,82	2,45	171056,13	2,97	70780,88	3,49	23295,47
1,94	329968,55	2,46	168527,61	2,98	69436,62	3,50	22750,13
1,95	326355,22	2,47	166023,25	2,99	68112,12	3,51	22215,59
1,96	322758,11	2,48	163543,06	3,00	66807,20	3,52	21691,69
1,97	319177,51	2,49	161087,06	3,01	65521,71	3,53	21178,27
1,98	315613,70	2,50	158655,25	3,02	64255,49	3,54	20675,16
1,99	312066,95	2,51	156247,65	3,03	63008,36	3,55	20182,22
2,00	308537,54	2,52	153864,23	3,04	61780,18	3,56	19699,27
2,01	305025,73	2,53	151505,00	3,05	60570,76	3,57	19226,17
2,02	301531,79	2,54	149169,95	3,06	59379,94	3,58	18762,77
2,03	298055,97	2,55	146859,06	3,07	58207,56	3,59	18308,90
2,04	294598,52	2,56	144572,30	3,08	57053,43	3,60	17864,42
2,05	291159,69	2,57	142309,65	3,09	55917,40	3,61	17429,18
2,06	287739,72	2,58	140071,09	3,10	54799,29	3,62	17003,02
2,07	284338,85	2,59	137856,57	3,11	53698,93	3,63	16585,81
2,08	280957,31	2,60	135666,06	3,12	52616,14	3,64	16177,38
2,09	277595,32	2,61	133499,51	3,13	51550,75	3,65	15777,61
2,10	274253,12	2,62	131356,88	3,14	50502,58	3,66	15386,33
2,11	270930,90	2,63	129238,11	3,15	49471,47	3,67	15003,42
2,12	267628,89	2,64	127143,15	3,16	48457,23	3,68	14628,73
2,13	264347,29	2,65	125071,94	3,17	47459,68	3,69	14262,12
2,14	261086,30	2,66	123024,40	3,18	46478,66	3,70	13903,45
2,15	257846,11	2,67	121000,48	3,19	45513,98	3,71	13552,58
2,16	254626,91	2,68	119000,11	3,20	44565,46	3,72	13209,38
2,17	251428,90	2,69	117023,20	3,21	43632,94	3,73	12873,72
2,18	248252,23	2,70	115069,67	3,22	42716,22	3,74	12545,46
2,19	245097,09	2,71	113139,45	3,23	41815,14	3,75	12224,47
2,20	241963,65	2,72	111232,44	3,24	40929,51	3,76	11910,63
2,21	238852,07	2,73	109348,55	3,25	40059,16	3,77	11603,79
2,22	235762,50	2,74	107487,70	3,26	39203,90	3,78	11303,84
2,23	232695,09	2,75	105649,77	3,27	38363,57	3,79	11010,66
2,24	229650,00	2,76	103834,68	3,28	37537,98	3,80	10724,11
2,25	226627,35	2,77	102042,32	3,29	36726,96	3,81	10444,08
2,26	223627,29	2,78	100272,57	3,30	35930,32	3,82	10170,44
2,27	220649,95	2,79	98525,33	3,31	35147,89	3,83	9903,08
2,28	217695,44	2,80	96800,48	3,32	34379,50	3,84	9641,87
2,29	214763,88	2,81	95097,92	3,33	33624,97	3,85	9386,71
2,30	211855,40	2,82	93417,51	3,34	32884,12	3,86	9137,47
2,31	208970,09	2,83	91759,14	3,35	32156,77	3,87	8894,04
2,32	206108,05	2,84	90122,67	3,36	31442,76	3,88	8656,32
2,33	203269,39	2,85	88507,99	3,37	30741,91	3,89	8424,19
2,34	200454,19	2,86	86914,96	3,38	30054,04	3,90	8197,54
2,35	197662,54	2,87	85343,45	3,39	29378,98	3,91	7976,26
2,36	194894,52	2,88	83793,32	3,40	28716,56	3,92	7760,25
2,37	192150,20	2,89	82264,44	3,41	28066,61	3,93	7549,41
2,38	189429,65	2,90	80756,66	3,42	27428,95	3,94	7343,63
2,39	186732,94	2,91	79269,84	3,43	26803,42	3,95	7142,81
2,40	184060,13	2,92	77803,84	3,44	26189,84	3,96	6946,85
2,41	181411,25	2,93	76358,51	3,45	25588,06	3,97	6755,65
2,42	178786,38	2,94	74933,70	3,46	24997,90	3,98	6569,12
2,43	176185,54	2,95	73529,26	3,47	24419,19	3,99	6387,15

Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO	Nilai Sigma	DPMO
4,00	6209,67	4,53	1222,77	5,06	185,43	5,59	21,57
4,01	6036,56	4,54	1182,89	5,07	178,49	5,60	20,66
4,02	5867,74	4,55	1144,21	5,08	171,80	5,61	19,78
4,03	5703,13	4,56	1106,68	5,09	165,34	5,62	18,94
4,04	5542,62	4,57	1070,29	5,10	159,11	5,63	18,14
4,05	5386,15	4,58	1035,00	5,11	153,10	5,64	17,37
4,06	5233,61	4,59	1000,78	5,12	147,30	5,65	16,62
4,07	5084,93	4,60	967,60	5,13	141,71	5,66	15,91
4,08	4940,02	4,61	935,44	5,14	136,32	5,67	15,23
4,09	4798,80	4,62	904,26	5,15	131,12	5,68	14,58
4,10	4661,19	4,63	874,03	5,16	126,11	5,69	13,95
4,11	4527,11	4,64	844,74	5,17	121,28	5,70	13,35
4,12	4396,49	4,65	816,35	5,18	116,62	5,71	12,77
4,13	4269,24	4,66	788,85	5,19	112,13	5,72	12,22
4,14	4145,30	4,67	762,19	5,20	107,80	5,73	11,68
4,15	4024,59	4,68	736,38	5,21	103,63	5,74	11,18
4,16	3907,03	4,69	711,36	5,22	99,61	5,75	10,69
4,17	3792,56	4,70	687,14	5,23	95,74	5,76	10,22
4,18	3681,11	4,71	663,67	5,24	92,01	5,77	9,77
4,19	3572,60	4,72	640,95	5,25	88,42	5,78	9,34
4,20	3466,97	4,73	618,95	5,26	84,96	5,79	8,93
4,21	3364,16	4,74	597,65	5,27	81,62	5,80	8,54
4,22	3264,10	4,75	577,03	5,28	78,41	5,81	8,16
4,23	3166,72	4,76	557,06	5,29	75,32	5,82	7,80
4,24	3071,96	4,77	537,74	5,30	72,35	5,83	7,46
4,25	2979,76	4,78	519,04	5,31	69,48	5,84	7,12
4,26	2890,07	4,79	500,94	5,32	66,73	5,85	6,81
4,27	2802,81	4,80	483,42	5,33	64,07	5,86	6,50
4,28	2717,94	4,81	466,48	5,34	61,52	5,87	6,21
4,29	2635,40	4,82	450,09	5,35	59,06	5,88	5,93
4,30	2555,13	4,83	434,23	5,36	56,69	5,89	5,67
4,31	2477,07	4,84	418,89	5,37	54,42	5,90	5,41
4,32	2401,18	4,85	404,06	5,38	52,23	5,91	5,17
4,33	2327,40	4,86	389,71	5,39	50,12	5,92	4,94
4,34	2255,68	4,87	375,84	5,40	48,10	5,93	4,71
4,35	2185,96	4,88	362,43	5,41	46,15	5,94	4,50
4,36	2118,21	4,89	349,46	5,42	44,27	5,95	4,29
4,37	2052,36	4,90	336,93	5,43	42,47	5,96	4,10
4,38	1988,38	4,91	324,81	5,44	40,74	5,97	3,91
4,39	1926,21	4,92	313,11	5,45	39,08	5,98	3,73
4,40	1865,81	4,93	301,79	5,46	37,47	5,99	3,56
4,41	1807,14	4,94	290,86	5,47	35,94	6,00	3,40
4,42	1750,16	4,95	280,29	5,48	34,46		
4,43	1694,81	4,96	270,09	5,49	33,04		
4,44	1641,06	4,97	260,23	5,50	31,67		
4,45	1588,87	4,98	250,71	5,51	30,36		
4,46	1538,20	4,99	241,51	5,52	29,10		
4,47	1489,00	5,00	232,63	5,53	27,89		
4,48	1441,24	5,01	224,05	5,54	26,73		
4,49	1394,89	5,02	215,77	5,55	25,61		
4,50	1349,90	5,03	207,78	5,56	24,54		
4,51	1306,24	5,04	200,06	5,57	23,51		
4,52	1263,87	5,05	192,62	5,58	22,52		

LAMPIRAN 4

Perhitungan Benefit Modernisasi Topologi IuB

Data – data berikut, diambil dari *Techno-Economic Modelling* Nokia Siemens Networks [24]

IuB Over Head Factor	CS/ATM	CS/IP	PS/ATM	PS/IP	RNC CS Grooming	RNC PS Grooming
	1,1	2,8	1,5	1,1	2,5	2,5

Transport Interface CAPEX

Licence Activation (EUR)/Site	Full Leased Line	Hybrid Backhaul	Dual IuB	Full IP
	0	968	445	720

OPEX Leased Line

	OPEX EUR/yr	Mbps	Fill Rate	Used Mbps	Cost per Mbps
E1	6525	2	80%	1,6	3907,50
STM-1	130560	155	90%	139,5	935,91
Ethernet 30M	20868	30	90%	27	772,89
Ethernet 1000M	106344	1000	90%	900	118,16

$$\text{Cost OPEX per Mbps} = \frac{\text{OPEX EUR/ yr}}{\text{Used Mbps}}$$

RNC Interfaces

	# IF/Card	Mbps/IF	Fill Rate	Available	Cost/Card	Cost/Mbps
STM-1 IF	4	155	90%	558	2.906	5,21
GE IF	2	1000	90%	1800	6.375	3,54
E1 IF	16	2	80%	25,6	2.276	88,91

$$\text{Cost RNC Interfaces per Mbps} = \frac{\text{Cost per Card}}{\text{Available}}$$

Other Cost

	CAPEX (EUR)	OPEX (EUR)	Capacity
Multiserver Router	30000	6000	1000

BTS Upgrade to IP (hybrid), capex/ BTS : EUR 1500

Data – data *Network Profile* berikut, berdasarkan pada data *planing* Modernisasi IuB pada PT. Telkomsel. Selanjutnya, untuk pertumbuhan *traffic* berdasarkan pada asumsi *feature roadmap 3G RAN* dan teknologi yang digunakan.

		2009	2010E	2011E	2012E
Number of Sites	#	150	300	450	600
Troughput Cells per	Mbps	3,6	21	42	84

Site					
Troughput CS Peak Capacity per Site	Mbps	1,0	1,3	1,6	1,9
Troughput PS Peak Capacity per Site	Mbps	10,8	40	50	90

Perhitungan umum yang berlaku untuk kesemua topologi IuB dapat dihitung sebagai berikut:

Number of Cell Troghput = Troughput Cells per Site x Number of Sites

Addition Cells for Licence Activation = Number of Sites_{n+1} - Number of Sites_n

PS Load per Site = Troughput PS Peak Capacity per Site

IuPS Load (RNC PS Groomed) = $\frac{\text{PS Load per Site} \times \text{Number of Sites}}{\text{RNC PS Grooming}}$

New IuPS Load (AdditionalRNC PS Groomed) = IuPS Load (RNC PS Groomed)_{n+1} - IuPS Load (RNC PS Groomed)_n

Sehingga diperoleh hasil perhitungan sesuai dengan tabel di bawah ini:

		2009	2010E	2011E	2012E
Number of Cells Troughput	Mbps	540	6300	18900	50400
Addition Site for Licence Activation	#	150	150	150	150
PS Load per Site	Mbps	10,8	40	50	90
IuPS Load (RNC PS Groomed)	Mbps	648	4800	9000	21600
New IuPS Load (AdditionalRNC PS Groomed)	Mbps	0	4152	4848	16752

Proses perhitungan berikutnya, akan di bagi – bagi sesuai dengan topologi masing – masing *IuB*.

A. Full Leased Line E1 Used

CS Iub Load on LL per Site = IuB Over Head Factor (CS/ATM) x Troughput CS Peak Capacity per Site

PS Iub Load on LL per Site = IuB Over Head Factor (PS/ATM) x Troughput PS Peak Capacity per Site

Total Load on LL per Site per Site = CS Iub Load on LL per Site + PS Iub Load on LL per Site

LL Required per Site (E1 required) = $\frac{\text{Total Load on LL per Site}}{1E1}$

Annual Network LL OPEX = LL Required per Site (E1 required) x Number of Sites x OPEX Leased Line E1

New RNC E1 interfaces = $((\text{Total Load on LL per Site} \times \text{Number of Sites})_{n+1} - (\text{Total Load on LL per Site} \times \text{Number of Sites})_n) \times \text{RNC Interfaces E1 Cost per Mbps}$

New Iu-PS Capacity CAPEX = New IuPS Load (Additional RNC PS Groomed) x RNC Interfaces STM-1 Cost per Mbps

Annual Iu-PS OPEX = IuPS Load (RNC PS Groomed) x OPEX Leased Line STM-1 Cost per Mbps

Iub Transport HW = New RNC E1 interfaces

Iu-PS HW = New Iu-PS Capacity CAPEX

Annual CAPEX = Iub Transport HW + Iu-PS HW

Annual OPEX = Annual Network LL OPEX + Annual Iu-PS OPEX

Annual CAPEX + OPEX = Annual OPEX + Annual CAPEX

Cumulative Cost_n = Cumulative Cost_{n-1} + Cumulative Cost_n

Selanjutnya, hasil perhitungan tersebut dimasukkan ke dalam Tabel Full Leased Line

FULL Leased Line		2009	2010E	2011E	2012E
CS lub Load on LL per Site	Mbps	1,1	1,43	1,76	2,09
PS lub Load on LL per Site	Mbps	16,2	60	75	135
Total Load on LL per Site	Mbps	17,3	61,43	76,76	137,09
LL Required per Site (E1 required)	n	9	31	39	69
Annual Network LL OPEX	EUR x 1000	8.808,75	60.682,50	114.513,75	270.135,00
lub Transport HW					
New RNC E1 interfaces	EUR	0	1.407.800,94	1.432.606,83	4.242.073,92
lu-PS CAPEX & OPEX (annual)					
New lu-PS Capacity CAPEX	EUR	0	21.631,92	25.258,08	87.277,92
Annual lu-PS OPEX	EUR	606.469,68	4.492.368,00	8.423.190,00	20.215.656,00
CAPEX					
lub Transport HW	EUR x 1000	0,00	1.407,80	1.432,61	4.242,07
lu-PS HW	EUR x 1000	0,00	21,63	25,26	87,28
Annual CAPEX	EUR x 1000	0,00	1.429,43	1.457,86	4.329,35
OPEX					
lub Transmission Annual Cost	EUR x 1000	8.808,75	60.682,50	114.513,75	270.135,00
lu-PS Annual Cost	EUR x 1000	606,47	4.492,37	8.423,19	20.215,66
Annual OPEX	EUR x 1000	9.415,22	65.174,87	122.936,94	290.350,66
Cumulative Cost Analysis					
Annual CAPEX + OPEX	EUR x 1000	9.415,22	66.604,30	124.394,80	294.680,01
Cumulative Cost	EUR x 1000	9.415,22	76.019,52	200.414,33	495.094,33

B. Hybrid Backhaul Transport

CS Iub Load on LL per Site	= IuB Over Head Factor (CS/ATM) x Troughput CS Peak Capacity per Site
PS Iub Load on IP per Site	= IuB Over Head Factor (PS/IP) x Troughput PS Peak Capacity per Site
LL Required per Site (E1 required)	= $\frac{\text{CS Iub Load on LL per Site}}{1\text{E1}}$
Annual Network LL OPEX	= LL Required per Site (E1 required) x Number of Sites x OPEX Leased Line E1
Annual Network IP OPEX	= PS Iub Load on IP per Site x Number of Sites x OPEX Leased Line Ethernet
Transport HBH Licence Activation/ Site	= Licence HBH Activation (EUR)/Site x Addition Site for Licence Activation
Upgrading Existing BTS Sites	= BTS Upgrade to IP (hybrid), capex/ BTS x Addition Site for Licence Activation
MultiServer Router at RNC Site Cumulative =	$\frac{\text{PS Iub Load on IP per Site} \times \text{Number of Sites}}{\text{Capacity Multi Server Router}} \times \text{Multi Server CAPEX}$
New RNC E1 interfaces	= ((Total Load on LL per Site x Number of Sites) _{n+1} - (Total Load on LL per Site x Number of Sites) _n) x RNC Interfaces E1 Cost per Mbps
Total Cumulative Iub HW CAPEX	= Transport HBH Licence Activation/ Site + Upgrading Existing BTS Sites + MultiServer Router at RNC Site Cumulative + New RNC E1 interfaces + New RNC GE interfaces
New Iu-PS Capacity CAPEX	= New IuPS Load (Additional RNC PS Groomed) x RNC Interfaces STM-1 Cost per Mbps
Annual Iu-PS OPEX	= IuPS Load (RNC PS Groomed) x OPEX Leased Line STM-1 Cost per Mbps
Annual CAPEX	= Total Cumulative Iub HW CAPEX + New Iu-PS Capacity CAPEX
Annual OPEX	= Annual Network LL OPEX + Annual Network IP OPEX + Annual Iu-PS OPEX
Annual CAPEX + OPEX	= Annual OPEX + Annual CAPEX
Cumulative Cost _n	= Cumulative Cost _{n-1} + Cumulative Cost _n

Selanjutnya, hasil perhitungan tersebut dimasukkan ke dalam Tabel Hybrid Backhaul Transport Leased Line

Hybrid Backhaul Transport		2009	2010E	2011E	2012E
CS lub Load on LL per Site	Mbps	1,1	1,43	1,76	2,09
PS lub Load on IP per Site	Mbps	11,88	44	55	99
LL Required per Site (E1 required)	n	1	1	1	2
IP Connection Required per Site (Eth required)	Mbps	11,88	44	55	99
Annual Network LL OPEX	EUR x 1000	979	1.958	2.936	7.830
Annual Network IP OPEX	EUR x 1000	1.377	10.202	19.129	45.910
Transport HBH Licence Activation/ Site	EUR x 1000	145	145	145	145
lub Transport HW					
Upgrading Existing BTS Sites	EUR x 1000	225	450	675	900
MultiServer Router at RNC Site Cumulative	EUR x 1000	60	420	750	1.800
New RNC E1 interfaces	EUR x 1000	0	23.472	32.274	41.076
New RNC GE interfaces	EUR x 1000	0	40	41	123
Total Cumulative lub HW CAPEX	EUR x 1000	430	24.528	33.885	44.044
lu-PS CAPEX & OPEX (annual)					
New lu-PS Capacity CAPEX	EUR x 1000	0	21,63	25,26	87,28
Annual lu-PS OPEX	EUR x 1000	606,47	4.492,37	8.423,19	20.215,66
CAPEX					
lub Transport HW	EUR x 1000	430	24.528	33.885	44.044
lu-PS HW	EUR x 1000	0	21,63	25,26	87,28
Annual CAPEX	EUR x 1000	430	24.549	33.911	44.132
OPEX					
lub Transmission Annual Cost	EUR x 1000	2.356	12.160	22.065	53.740
lu-PS Annual Cost	EUR x 1000	606,47	4.492,37	8.423,19	20.215,66
Annual OPEX	EUR x 1000	2.963	16.652	30.488	73.955
Cumulative Cost Analysis					
Annual CAPEX + OPEX	EUR x 1000	3.393	41.202	64.399	118.087
Cumulative Cost	EUR x 1000	3.393	44.594	108.993	227.080

C. Dual IuB

CS Iub Load on LL per Site = IuB Over Head Factor (CS/ATM) x Troughput CS Peak Capacity per Site

PS Iub Load on IP per Site = IuB Over Head Factor (PS/IP) x Troughput PS Peak Capacity per Site

LL Required per Site (E1 required) = $\frac{\text{CS Iub Load on LL per Site}}{1E1}$

Annual Network LL OPEX = LL Required per Site (E1 required) x Number of Sites x OPEX Leased Line E1

Annual Network IP OPEX = PS Iub Load on IP per Site x Number of Sites x OPEX Leased Line Ethernet

Transport Dual IuB Licence Activation/ Site = Licence IuB Activation (EUR)/Site x Addition Site for Licence Activation

Upgrading Existing BTS Sites = BTS Upgrade to IP (hybrid), capex/ BTS x Addition Site for Licence Activation

New RNC E1 interfaces = $((\text{Total Load on LL per Site} \times \text{Number of Sites})_{n+1} - (\text{Total Load on LL per Site} \times \text{Number of Sites})_n) \times \text{RNC Interfaces E1 Cost per Mbps}$

New RNC GE interfaces = $((\text{Total PS Iub Load on IP per Site} \times \text{Number of Sites})_{n+1} - (\text{Total PS Iub Load on IP per Site} \times \text{Number of Sites})_n) \times \text{RNC Interfaces Ethernet Cost per Mbps}$

Total Cumulative Iub HW CAPEX = Transport Dual IuB Licence Activation/ Site + Upgrading Existing BTS Sites + New RNC E1 interfaces + New RNC GE interfaces

New Iu-PS Capacity CAPEX = New IuPS Load (Additional RNC PS Groomed) x RNC Interfaces Ethernet Cost per Mbps

Annual Iu-PS OPEX = IuPS Load (RNC PS Groomed) x OPEX Leased Line Ethernet Cost per Mbps

Annual CAPEX = Total Cumulative Iub HW CAPEX + New Iu-PS Capacity CAPEX

Annual OPEX = Annual Network LL OPEX + Annual Network IP OPEX + Annual Iu-PS OPEX

Annual CAPEX + OPEX = Annual OPEX + Annual CAPEX

Cumulative Cost_n = Cumulative Cost_{n-1} + Cumulative Cost_n

Selanjutnya, hasil perhitungan tersebut dimasukkan ke dalam Tabel Dual IuB Transport

Dual luB Transport		2009	2010E	2011E	2012E
CS luB Load on LL per Site	Mbps	1,1	1,43	1,76	2,09
PS luB Load on IP per Site	Mbps	11,88	44	55	99
LL Required per Site (E1 required)	n	1	1	1	2
IP Connection Required per Site (Eth required)	Mbps	11,88	44	55	99
Annual Network LL OPEX	EUR x 1000	979	1.958	2.936	7.830
Annual Network IP OPEX	EUR x 1000	211	1.560	2.924	7.019
Transport Dual luB Licence Activation/ Site	EUR x 1000	67	67	67	67
luB Transport HW					
Upgrading Existing BTS Sites	EUR x 1000	225	450	675	900
New RNC E1 interfaces	EUR x 1000	0	23.472	32.274	41.076
New RNC GE interfaces	EUR x 1000	0	40	41	123
Total Cumulative luB HW CAPEX	EUR x 1000	292	24.029	33.057	42.166
lu-PS CAPEX & OPEX (annual)					
New lu-PS Capacity CAPEX	EUR x 1000	0	14,70	17,16	59,30
Annual lu-PS OPEX	EUR x 1000	76,57	567,17	1.063,44	2.552,26
CAPEX					
luB Transport HW	EUR x 1000	292	24.029	33.057	42.166
lu-PS HW	EUR x 1000	0	14,70	17,16	59,30
Annual CAPEX	EUR x 1000	292	24.044	33.074	42.225
OPEX					
luB Transmission Annual Cost	EUR x 1000	1.189	3.517	5.861	14.849
lu-PS Annual Cost	EUR x 1000	76,57	567,17	1.063,44	2.552,26
Annual OPEX	EUR x 1000	1.266	4.084	6.924	17.401
Cumulative Cost Analysis					
Annual CAPEX + OPEX	EUR x 1000	1.558	28.128	39.998	59.626
Cumulative Cost	EUR x 1000	1.558	29.686	69.684	129.310

D. Full IP

CS Iub Load on IP per Site	= IuB Over Head Factor (CS/IP) x Troughput CS Peak Capacity per Site
PS Iub Load on IP per Site	= IuB Over Head Factor (PS/IP) x Troughput PS Peak Capacity per Site
Annual Network IP OPEX	=(CS Iub Load on IP per Site + PS Iub Load on IP per Site) x Number of Sites x OPEX Leased Line Ethernet
Transport Full IP IuB Licence Activation/ Site	= Licence Full IP IuB Activation (EUR)/Site x Addition Site for Licence Activation
Upgrading Existing BTS Sites	= BTS Upgrade to IP (hybrid), capex/ BTS x Addition Site for Licence Activation
New RNC GE interfaces	= ((Total Iub Load on IP per Site x Number of Sites) _{n+1} - (Total Iub Load on IP per Site x Number of Sites) _n) x RNC Interfaces Ethernet Cost per Mbps
Total Cumulative Iub HW CAPEX	= Transport Full IP IuB Licence Activation/ Site + Upgrading Existing BTS Sites + New RNC GE interfaces
New Iu-PS Capacity CAPEX	= New IuPS Load (Additional RNC PS Groomed) x RNC Interfaces Ethernet Cost per Mbps
Annual Iu-PS OPEX	= IuPS Load (RNC PS Groomed) x OPEX Leased Line Ethernet Cost per Mbps
Annual CAPEX	= Total Cumulative Iub HW CAPEX + New Iu-PS Capacity CAPEX
Annual OPEX	= Annual Network LL OPEX + Annual Network IP OPEX + Annual Iu-PS OPEX
Annual CAPEX + OPEX	= Annual OPEX + Annual CAPEX
Cumulative Cost _n	= Cumulative Cost _{n-1} + Cumulative Cost _n

Selanjutnya, hasil perhitungan tersebut dimasukkan ke dalam Tabel Full IP Transport.

Full IP Transport		2009	2010E	2011E	2012E
CS Iub Load on IP per Site	Mbps	2,8	3,64	4,48	5,32
PS Iub Load on IP per Site	Mbps	11,88	44	55	99
IP Connection Required per Site (Eth required)	Mbps	14,68	47,64	59,48	104,32
Annual Network IP OPEX	EUR x 1000	260	1.689	3.163	7.396
Transport Full IP Licence Activation/ Site	EUR x 1000	108	108	108	108
Iub Transport HW					
Upgrading Existing BTS Sites	EUR x 1000	225	450	675	900

New RNC GE interfaces	EUR x 1000	0	43	44	127
Total Cumulative Iub HW CAPEX	EUR x 1000	333	493	719	1.027
Iu-PS CAPEX & OPEX (annual)					
New Iu-PS Capacity CAPEX	EUR x 1000	0	14,70	17,16	59,30
Annual Iu-PS OPEX	EUR x 1000	76,57	567,17	1.063,44	2.552,26
CAPEX					
Iub Transport HW	EUR x 1000	333	493	719	1.027
Iu-PS HW	EUR x 1000	0	14,70	17,16	59,30
Annual CAPEX	EUR x 1000	333	507	736	1.086
OPEX					
Iub Transmission Annual Cost	EUR x 1000	260	1.689	3.163	7.396
Iu-PS Annual Cost	EUR x 1000	76,57	567,17	1.063,44	2.552,26
Annual OPEX	EUR x 1000	337	2.256	4.226	9.948
Cumulative Cost Analysis					
Annual CAPEX + OPEX	EUR x 1000	670	2.763	4.962	11.034
Cumulative Cost	EUR x 1000	670	3.433	8.396	19.430