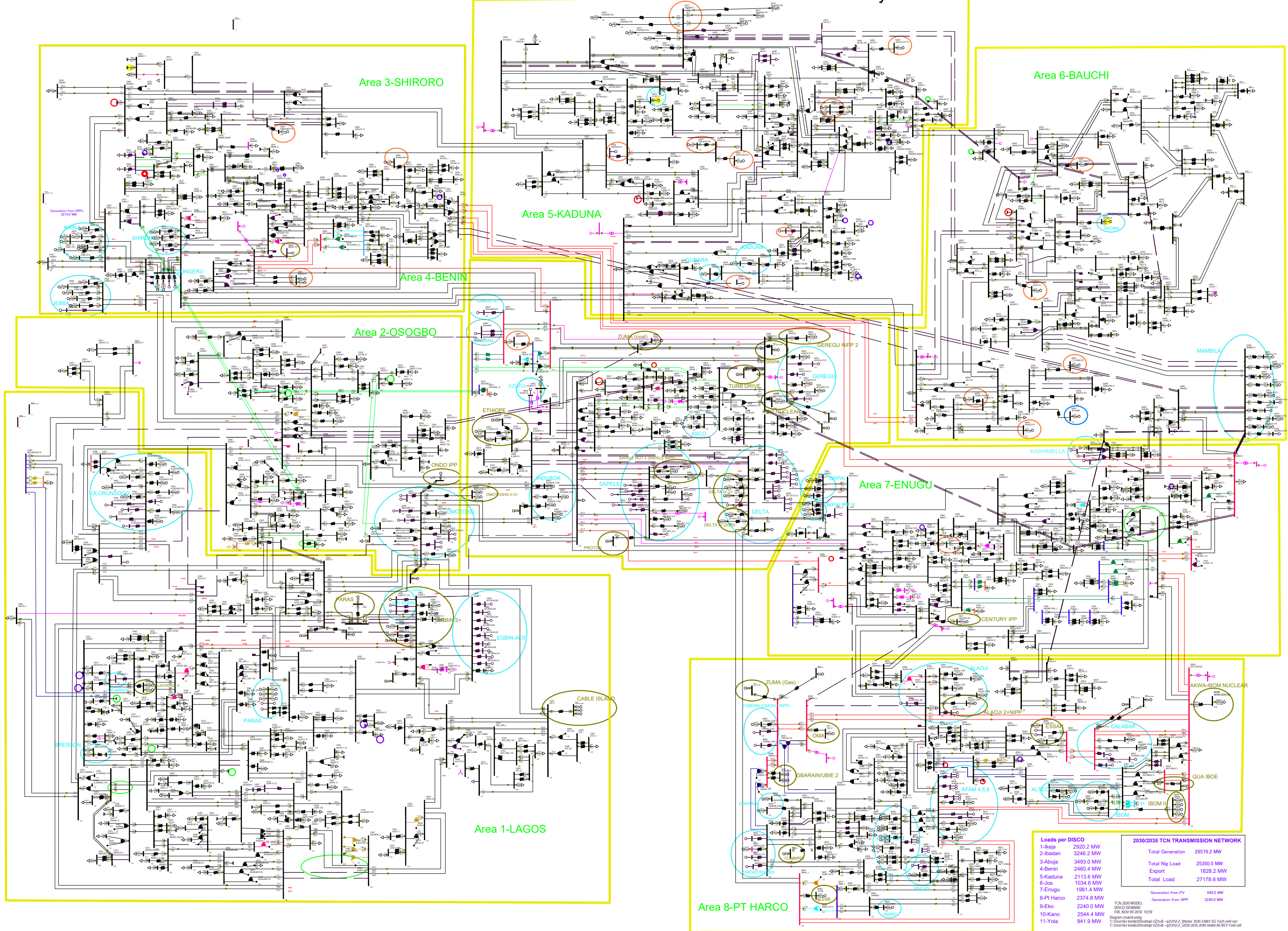


Annex 7.6.2 SLD in PSSE for TCN transmission system-2030

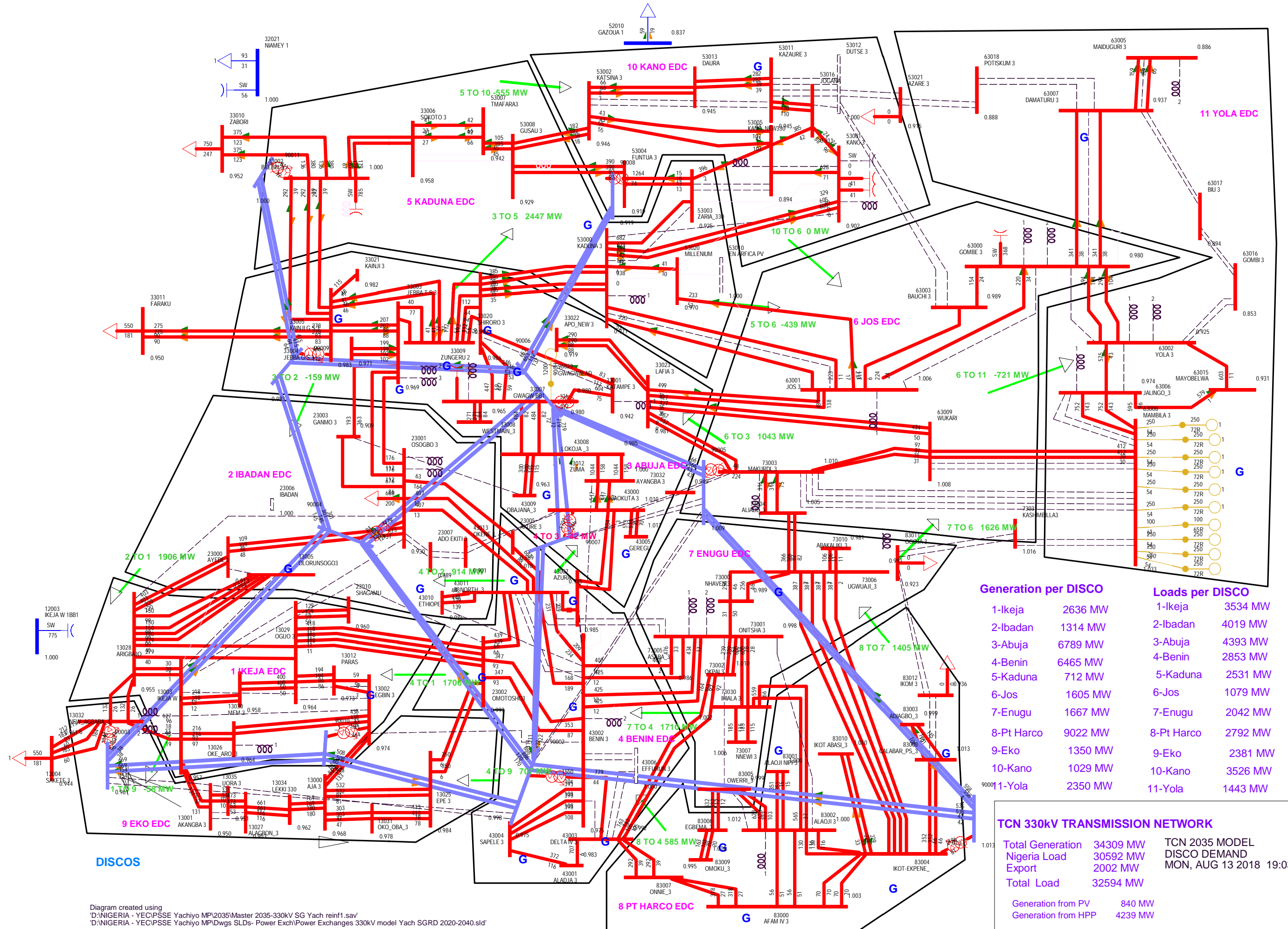


Loads per DISCO		2030/2035 TCN TRANSMISSION NETWORK	
1-Ikeja	2920.2 MW	Total Generation	28579.2 MW
2-Ibadan	3246.2 MW	Total Nig Load	25350.5 MW
3-Abuja	3493.0 MW	Export	1628.2 MW
4-Benin	2460.4 MW	Total Load	27178.6 MW
5-Kaduna	2113.6 MW		
6-Jos	1034.6 MW		
7-Enugu	1981.4 MW		
8-Pt Harco	2374.8 MW	Generation from PV	840.0 MW
9-Eko	2240.0 MW	Generation from HPP	3240.0 MW
10-Kano	2544.4 MW		
11-Yola	941.9 MW		

TCN 2030 MODEL
DISCO DEMAND
FBI, NOV 09 2018 10:59
Diagram created using
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Annex 7.7.1 330 kV transmission - 2035

7.7.1-1

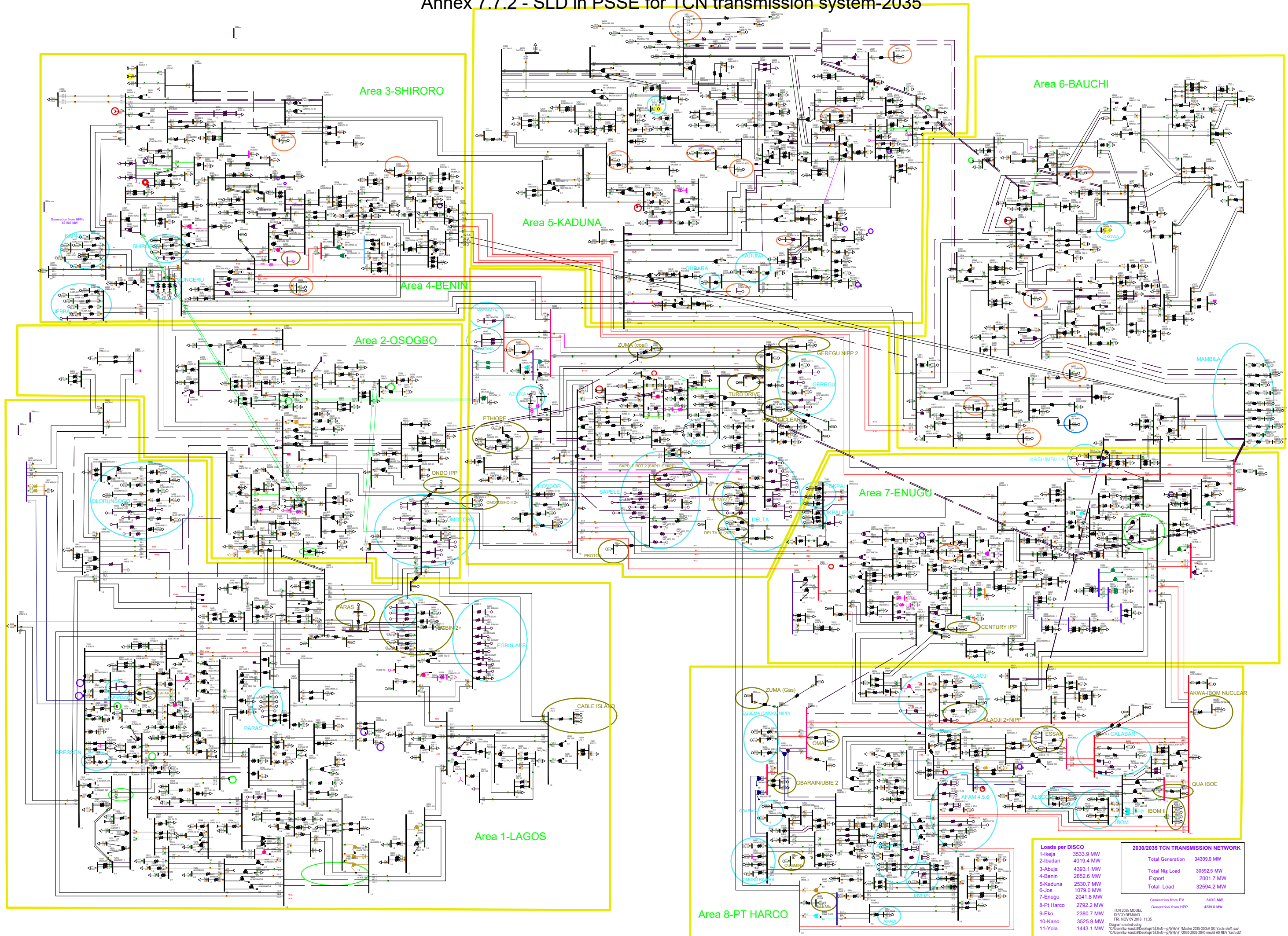


Generation per DISCO		Loads per DISCO	
1-Ikeja	2636 MW	1-Ikeja	3534 MW
2-Ibadan	1314 MW	2-Ibadan	4019 MW
3-Abuja	6789 MW	3-Abuja	4393 MW
4-Benin	6465 MW	4-Benin	2853 MW
5-Kaduna	712 MW	5-Kaduna	2531 MW
6-Jos	1605 MW	6-Jos	1079 MW
7-Enugu	1667 MW	7-Enugu	2042 MW
8-Pt Harco	9022 MW	8-Pt Harco	2792 MW
9-Eko	1350 MW	9-Eko	2381 MW
10-Kano	1029 MW	10-Kano	3526 MW
11-Yola	2350 MW	11-Yola	1443 MW

TCN 330kV TRANSMISSION NETWORK			
Total Generation	34309 MW	TCN 2035 MODEL	
Nigeria Load	30592 MW	DISCO DEMAND	
Export	2002 MW	MON, AUG 13 2018	19:03
Total Load	32594 MW		
Generation from PV	840 MW		
Generation from HPP	4239 MW		

Diagram created using
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Annex 7.7.2 - SLD in PSSE for TCN transmission system-2035

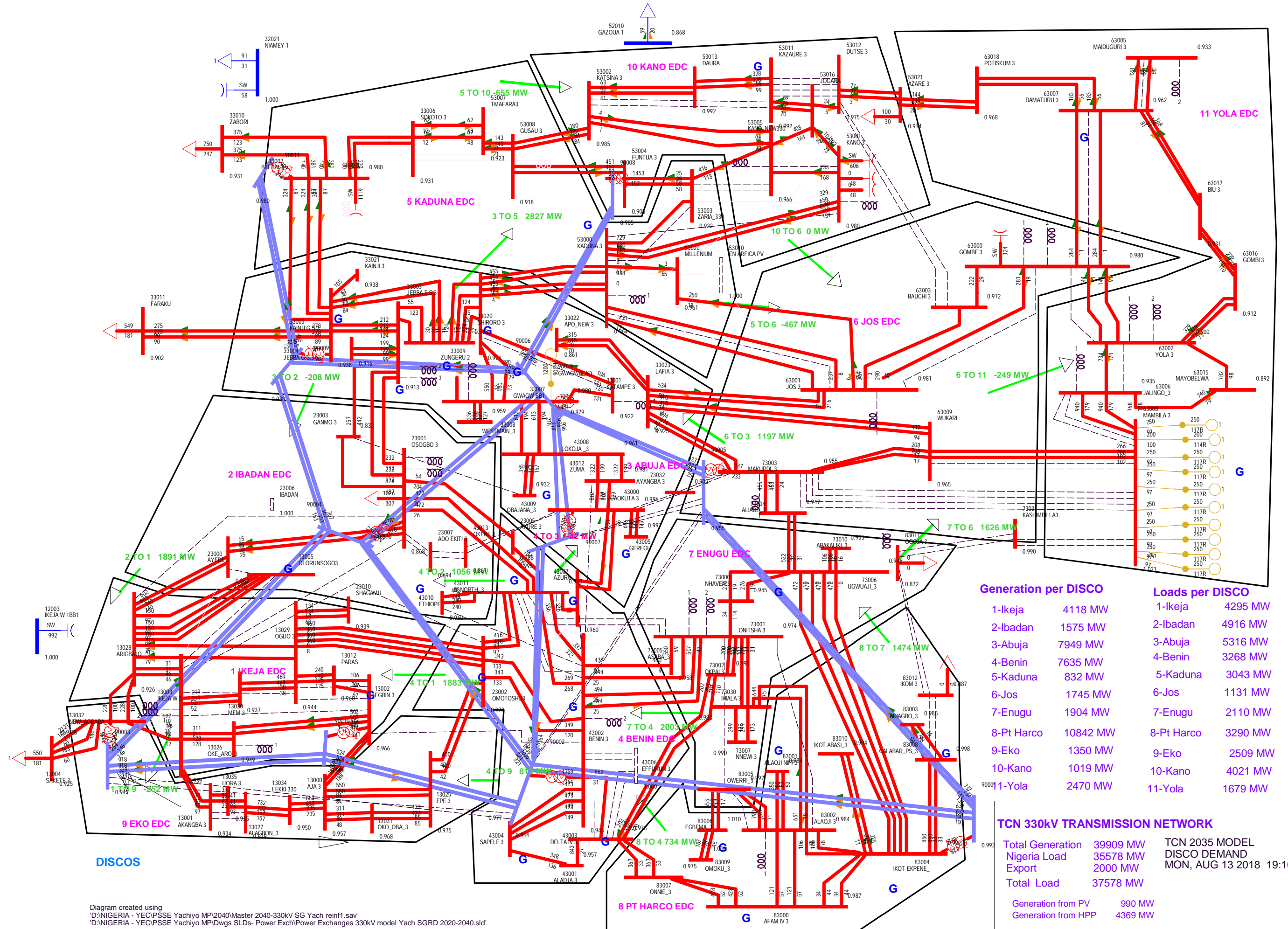


Loads per DISCO		2030/2035 TCN TRANSMISSION NETWORK	
1-Ikeja	3533.9 MW	Total Generation	34309.0 MW
2-Ibadan	4019.4 MW	Total Nig Load	30592.5 MW
3-Abuja	4393.1 MW	Export	2001.7 MW
4-Benin	2852.6 MW	Total Load	32594.2 MW
5-Kaduna	2530.7 MW		
6-Jos	1079.0 MW		
7-Enugu	2041.8 MW	Generation from PV	840.0 MW
8-Pt Harco	2792.2 MW	Generation from HPP	4238.0 MW
9-Eko	2380.7 MW		
10-Kano	3525.9 MW		
11-Yola	1443.1 MW		

TCN 2035 MODEL
DISCO DEMAND
FRI, NOV 09 2018 11:35
Diagram created using
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Annex 7.8.1 330 kV transmission – 2040

7.8.1-1

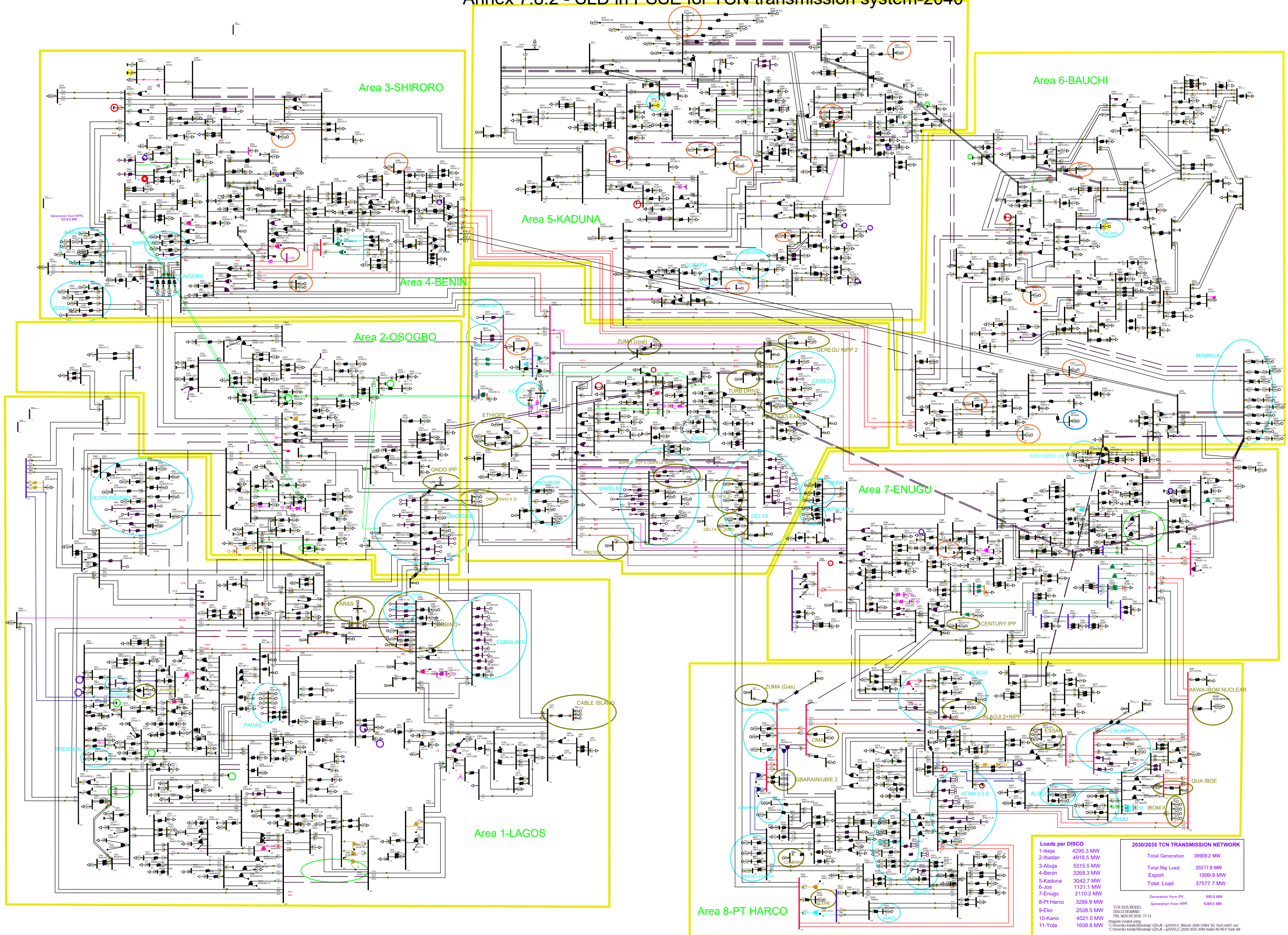


Generation per DISCO		Loads per DISCO	
1-Ikeja	4118 MW	1-Ikeja	4295 MW
2-Ibadan	1575 MW	2-Ibadan	4916 MW
3-Abuja	7949 MW	3-Abuja	5316 MW
4-Benin	7635 MW	4-Benin	3268 MW
5-Kaduna	832 MW	5-Kaduna	3043 MW
6-Jos	1745 MW	6-Jos	1131 MW
7-Enugu	1904 MW	7-Enugu	2110 MW
8-Pt Harco	10842 MW	8-Pt Harco	3290 MW
9-Eko	1350 MW	9-Eko	2509 MW
10-Kano	1019 MW	10-Kano	4021 MW
11-Yola	2470 MW	11-Yola	1679 MW

TCN 330kV TRANSMISSION NETWORK			
Total Generation	39909 MW	TCN 2035 MODEL	
Nigeria Load	35578 MW	DISCO DEMAND	
Export	2000 MW	MON, AUG 13 2018	19:10
Total Load	37578 MW		
Generation from PV	990 MW		
Generation from HPP	4369 MW		

Diagram created using
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Annex 7.8.2 - SLD in PSSE for TCN transmission system-2040



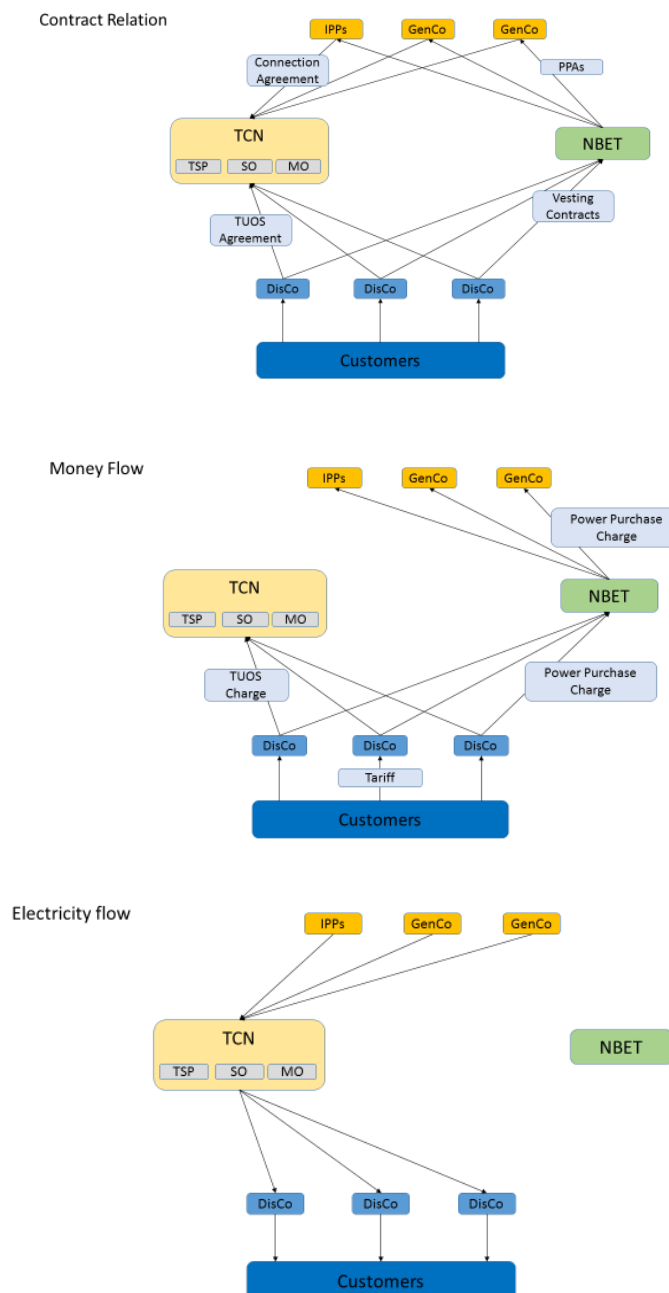
Loads per DISCO		2030/2035 TCN TRANSMISSION NETWORK	
1-Ikeja	4295.3 MW	Total Generation	39909.2 MW
2-Ibadan	4916.5 MW	Total Nig Load	35577.8 MW
3-Abuja	5315.5 MW	Export	1999.9 MW
4-Benin	3288.3 MW	Total Load	37577.7 MW
5-Kaduna	3042.7 MW		
6-Jos	1131.1 MW		
7-Enugu	2110.2 MW	Generation from PV	990.0 MW
8-Pt Harco	3289.9 MW	Generation from HPP	4389.0 MW
9-Eko	2508.5 MW		
10-Kano	4021.0 MW		
11-Yola	1608.8 MW		

TCN 2035 MODEL
 DISCO DEMAND
 FRI, NOV 09 2018 11:33
 Diagram created using
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Annex 9 a Electricity Tariff in Nigeria

(1) Electricity Supply Flow and Tariff Collection Flow

According to the Nigerian Bulk Electricity Trading Plc. (NBET), electricity supply flow is; power generation companies (GenCos) → Transmission Company of Nigeria (TCN) → distribution companies (DisCos) → consumers. However, charge collections are not made in the reverse flow. The flows are consumers → DisCos → TCN, and consumers → DisCos → NBET → GenCos, as shown in the following figure.



Source: JICA Study Team on the basis of the relevant organizations hearing
Figure A9a. 1 Power Supply Flow and Tariff Collection Flow

(2) Tariff for Electricity Generation

Tariffs paid by DisCos pay to GenCos through NBET have different settings by the power generation source and new entrants/successor companies. The tariffs are shown in the following table. The tariff for large hydro is set lower. The tariffs for small hydro and renewable energy are determined at higher level.

Table A9a. 1 Tariff by Type of Power Generation Source

Wholesale Generation Prices for the Successor Gas Power Plants

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	9,563	10,257	12,140	13,172	14,296
Capacity charge (N'000/MW/month)	3,515	3,789	4,084	4,403	4,747
Energy charge (N/MWh)	5,389	5,758	7,290	7,944	8,658

Wholesale Generation Prices for New Entrants Gas Power Plants

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	10,743	11,534	13,520	14,665	15,910
Capacity charge (N'000/MW/month)	4,359	4,701	5,071	5,470	5,902
Energy charge (N/MWh)	5,568	5,951	7,499	8,169	8,902

Wholesale Generation Prices for the New Entrant Coal Plants

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	25,106	27,024	29,097	31,559	34,232
Capacity charge (N'000/MW/month)	13,971	15,103	16,328	17,651	19,083
Energy charge (N/MWh)	11,135	11,921	12,769	13,907	15,150

Wholesale Generation Prices for the Successor Large Hydro Plants

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	4,898	5,290	5,715	6,174	6,671
Wholesale price including HYPADDEC charges	6,368	6,877	7,429	8,026	8,672
HYPADDEC Charges	1,470	1,587	1,714	1,852	2,001
Capacity charge (N'000/MW/month)	4,928	5,317	5,737	6,191	6,681
Energy charge (N/MWh)	1,439	1,560	1,692	1,835	1,991

Wholesale Feed-in Tariff for Small Hydro Plant

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	23,561	25,433	27,456	29,643	32,006

Wholesale Feed-in-Tariff for Land Mounted Wind Power Plant

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	24,543	26,512	28,641	30,943	33,433

Wholesale Feed-in-Tariff Solar Power Plant

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	67,917	73,300	79,116	85,401	92,192

Wholesale Feed-in-Tariff for Biomass Power Plant

	2012	2013	2014	2015	2016
Wholesale contract prices (N/MWh)	27,426	29,623	32,000	34,572	37,357

Source: NERC

(3) Tariff for Use of Transmission System

Transmission tariff paid by DisCos to TCN as the charge for use of the transmission system is shown in the following table. The tariff will be raised until 2020 and be lowered. The tariff for 2018 is NGN 3,913/MWh.

Table A9a. 2 Transmission Use of System Charge of Transmission Company (TCN)

	(NGN/MWh)									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Transmission Service Provider (TSP)	2,975	3,203	3,624	3,709	3,922	3,874	3,657	3,520	3,385	
System Operator (SO)	330	330	211	188	182	172	168	168	167	
Market Operator (MO)	22	20	12	11	11	10	10	10	10	
NERC Independent System Operator (ISO) Charge	5	5	3	3	3	3	3	3	3	
Ancillary Services	51	56	61	67	73	80	87	95	103	
Transmission User of System (TUOS) Charge	3,383	3,613	3,913	3,978	4,190	4,139	3,925	3,796	3,667	

Source: NERC

(4) Tariff for customers

Customer tariffs for electricity users are asset by customer class as shown in the below table.

Table A9a. 3 Customer Class for Electricity Users

Customer Classification	Description	Remarks
1 Residential		
R1	Life-Line (50 kWh)	A consumer who uses his premises exclusively as a residence - house, flat or multi-storeyed house where people reside.
R2	Single and 3-phase	
R3	LV Maximum Demand	
R4	HV Maximum Demand (11/33 KV)	
2 Commercial		
C1	Single and 3-phase	A consumer who uses his premises for any purpose other than exclusively as a residence or as a factory for manufacturing goods.
C2	LV Maximum Demand	
C3	HV Maximum Demand(11/33 KV)	
3 Industrial		
D1	Single and 3-phase	A consumer who uses his premises for manufacturing goods including welding and ironmongery.
D2	LV Maximum Demand	
D3	HV maximum Demand (11/33 KV)	
4 Special		
A1	Single and 3 Phase	Customers such as agriculture (agro-allied enterprises involving processing are excluded), water boards, religious houses, Government and teaching hospitals, Government research institutes and educational establishments.
A2	LV Maximum Demand	
A3	HV Maximum Demand (11/33 KV)	
5 Street Lighting		
S1	Single and 3-phase	

Source: NERC

Based on tariff tables and the records of electricity sales of 11 DisCos, JICA team has calculated weighted average tariff by customer class for all DisCos, as shown in the following table.

Table A9a. 4 Weighted Average Tariff by Customer Class

ENERGY CHARGES ₦/KWH					
TARIFF CODE DETAILS					
		2015	2016	2017	2018
R1		4.00	4.00	4.00	4.00
R2		23.77	21.76	22.18	19.75
R3		37.67	34.53	35.19	31.39
R4		37.67	34.53	35.19	31.39
C1		27.08	24.80	25.25	22.49
C2		35.02	32.09	32.71	29.17
C3		35.02	32.09	32.71	29.17
D1		28.96	26.54	27.09	24.15
D2		36.71	33.64	34.29	30.59
D3		36.71	33.64	34.29	30.59
A1		27.59	25.24	25.72	22.93
A2		27.59	25.24	25.72	22.93
A3		28.27	25.88	26.40	23.51
S1		23.22	21.24	21.69	19.26

Source: Create JICA team based on the NERC document

From the weighted average tariff by custom class, JICA team has further computed weighted average tariff for all users based on share of electricity sales by customer class as shown in the following table.

Table A9a. 5 Average Fee that is Weighted by Customer lass

ENERGY CHARGES ₦/KWH					
Weighted Average Tariff		2015	2016	2017	2018
Total		36.62	33.53	34.18	30.45

Source: Create JICA team based on the NERC document

Distribution use of system charge and balance mechanism are shown in the following table. The charge for use of distribution system is "Nominal tariff", among which "Variable Cost" is retained by each DisCo and "Compensation" is used to maintain balance among DisCos. The charges for distribution system use are different depending by DisCo.

Table A9a. 6 Distribution Use of System Charge and Balance Mechanism

Unit: NGN/MWh

		2012	2013	2014	2015	2016
Abuja	Nominal tariff	7,868	6,434	5,609	5,433	5,620
	Compensation	6,256	5,169	4,487	4,329	4,444
	Variable Cost	1,612	1,265	1,121	1,104	1,176
Benin	Nominal tariff	8,558	6,864	5,884	5,614	5,722
	Compensation	7,358	5,923	5,050	4,793	4,847
	Variable Cost	1,199	941	834	821	875
Enugu	Nominal tariff	8,386	6,778	5,850	5,615	5,755
	Compensation	7,050	5,730	4,921	4,700	4,781
	Variable Cost	1,336	1,048	929	915	974
Ibadan	Nominal tariff	9,881	7,982	6,897	6,626	6,813
	Compensation	7,766	6,322	5,425	5,177	5,269
	Variable Cost	2,116	1,660	1,472	1,449	1,543
Jos	Nominal tariff	9,340	7,614	6,640	6,432	6,654
	Compensation	7,375	6,072	5,273	5,086	5,220
	Variable Cost	1,965	1,542	1,367	1,345	1,433
Kaduna	Nominal tariff	9,657	7,729	6,664	6,387	6,541
	Compensation	8,171	6,563	5,630	5,369	5,457
	Variable Cost	1,486	1,166	1,034	1,018	1,084
Kano	Nominal tariff	7,581	6,214	5,442	5,293	5,492
	Compensation	6,308	5,215	4,557	4,421	4,564
	Variable Cost	1,273	999	886	872	929
Eko	Nominal tariff	8,162	6,795	5,968	5,817	6,050
	Compensation	6,460	5,459	4,783	4,652	4,808
	Variable Cost	1,702	1,336	1,184	1,166	1,242
Ikeja	Nominal tariff	6,243	5,375	4,800	4,750	5,000
	Compensation	4,827	4,264	3,815	3,781	3,968
	Variable Cost	1,416	1,111	985	969	1,033
Port Harcourt	Nominal tariff	8,856	7,165	6,225	6,008	6,186
	Compensation	7,422	6,040	5,228	5,027	5,141
	Variable Cost	1,433	1,125	997	982	1,046
Yola	Nominal tariff	9,883	7,966	6,889	6,622	6,801
	Compensation	8,031	6,513	5,601	5,354	5,450
	Variable Cost	1,852	1,453	1,288	1,268	1,351

Source: NERC

Tariff by Distribution Company (DisCo)

DisCo 1 – Abuja DisCo

Table 1: Fixed Charges - Abuja DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	702	843	1,011	1,213
R3	52,696	63,235	75,882	91,059
R4	136,030	163,236	195,883	235,059
C1	702	843	1,011	1,213
C2	47,772	57,326	68,791	82,549
C3	123,321	147,985	177,582	213,098
D1	1,000	1,200	1,440	1,728
D2	101,113	121,335	145,603	174,723
D3	123,321	147,985	177,582	213,098
A1	702	843	1,011	1,213
A2	43,125	51,750	62,100	74,520
A3	54,375	65,250	78,300	93,960
S1	600	720	864	1,037

Table 2: Energy Charges - Abuja DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	23.32	23.14	21.78	19.78
R3	37.68	37.39	35.19	31.96
R4	37.68	37.39	35.19	31.96
C1	27.59	27.37	25.76	23.40
C2	35.03	34.75	32.71	29.71
C3	35.03	34.75	32.71	29.71
D1	28.26	28.04	26.39	23.97
D2	36.72	36.43	34.28	31.14
D3	36.72	36.43	34.28	31.14
A1	27.05	26.84	25.26	22.95
A2	27.05	26.84	25.26	22.95
A3	27.05	26.84	25.26	22.95
S1	22.33	22.16	20.85	18.94

DisCo 2 – Benin DisCo

Table 3: Fixed Charges - Benin DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	750	900	1,080	1,296
R3	37,527	45,032	54,039	64,847
R4	133,091	159,709	191,651	229,981
C1	1,000	1,200	1,440	1,728
C2	34,020	40,824	48,989	58,787
C3	141,748	170,098	204,117	244,941
D1	1,000	1,200	1,440	1,728
D2	153,413	184,095	220,914	265,097
D3	155,923	187,107	224,529	269,435
A1	1,000	1,200	1,440	1,728
A2	37,813	45,375	54,450	65,340
A3	44,688	53,625	64,350	77,220
S1	1,000	1,200	1,440	1,728

Table 4: Energy Charges - Benin DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	23.80	20.38	20.67	16.77
R3	34.20	29.28	29.71	24.10
R4	34.20	29.28	29.71	24.10
C1	26.72	22.87	23.20	18.83
C2	31.79	27.22	27.61	22.40
C3	31.79	27.22	27.61	22.40
D1	25.65	21.96	22.28	18.08
D2	33.33	28.53	28.94	23.49
D3	33.33	28.53	28.94	23.49
A1	24.56	21.02	21.33	17.31
A2	24.56	21.02	21.33	17.31
A3	24.56	21.02	21.33	17.31
S1	25.30	21.66	21.97	17.83

DisCo 3 – Enugu DisCo

Table 5: Fixed Charges - Enugu DisCo

FIXED CHARGES N/MONTH TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	650	780	936	1,123
R3	24,424	29,308	35,170	42,204
R4	117,416	140,900	169,080	202,896
C1	650	780	936	1,123
C2	22,141	26,569	31,883	38,260
C3	106,446	127,736	153,283	183,940
D1	1,300	1,560	1,872	2,246
D2	104,733	125,679	150,815	180,978
D3	106,446	127,736	153,283	183,940
A1	650	780	936	1,123
A2	37,500	45,000	54,000	64,800
A3	46,935	56,322	67,586	81,103
S1	650	780	936	1,123

Table 6: Energy Charges - Enugu DisCo

ENERGY CHARGES ₦/KWH TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4	4	4	4
R2	32.00	26.73	26.14	22.39
R3	47.89	39.99	39.11	33.50
R4	47.89	39.99	39.11	33.50
C1	35.32	29.49	28.85	24.71
C2	44.51	37.17	36.35	31.14
C3	44.51	37.17	36.35	31.14
D1	35.91	29.99	29.33	25.13
D2	46.66	38.96	38.11	32.65
D3	46.66	38.96	38.11	32.65
A1	39.54	33.02	32.29	27.66
A2	39.54	33.02	32.29	27.66
A3	39.54	33.02	32.29	27.66
S1	30.32	25.32	24.76	21.21

DisCo 4 – Ibadan DisCo

Table 7: Fixed Charges - Ibadan DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	625	750	900	1,080
R3	18,764	22,516	27,019	32,423
R4	117,267	140,720	168,864	202,637
C1	500	600	720	864
C2	17,010	20,412	24,494	29,393
C3	106,311	127,573	153,088	183,705
D1	500	600	720	864
D2	104,600	125,519	150,623	180,748
D3	106,311	127,573	153,088	183,705
A1	500	600	720	864
A2	33,594	40,313	48,375	58,050
A3	46,875	56,250	67,500	81,000
S1	500	600	720	864

Table 8: Energy Charges - Ibadan DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	23.30	21.11	22.80	20.28
R3	37.30	33.79	36.50	32.47
R4	37.30	33.79	36.50	32.47
C1	24.68	22.35	24.15	21.48
C2	34.67	31.41	33.93	30.18
C3	34.67	31.41	33.93	30.18
D1	27.98	25.34	27.38	24.35
D2	36.34	32.93	35.57	31.64
D3	36.34	32.93	35.57	31.64
A1	26.78	24.26	26.21	23.31
A2	26.78	24.26	26.21	23.31
A3	26.78	24.26	26.21	23.31
S1	20.56	18.63	20.12	17.90

DisCo 5 – Jos DisCo

Table 9: Fixed Charges - Jos DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	775	930	1,116	1,339
R3	29,083	34,900	41,880	50,256
R4	181,764	218,117	261,740	314,088
C1	775	930	1,116	1,339
C2	26,366	31,639	37,966	45,560
C3	164,782	197,738	237,286	284,743
D1	1,395	1,674	2,009	2,411
D2	162,129	194,555	233,466	280,159
D3	164,782	197,738	237,286	284,743
A1	1,395	1,674	2,009	2,411
A2	62,969	75,563	90,675	108,810
A3	72,656	87,188	104,625	125,550
S1	1,395	1,674	2,009	2,411

Table 10: Energy Charges - Jos DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	34.09	32.26	33.83	27.70
R3	52.50	49.68	52.10	42.66
R4	52.50	49.68	52.10	42.66
C1	38.14	36.10	37.85	30.99
C2	48.80	46.18	48.42	39.65
C3	48.80	46.18	48.42	39.65
D1	38.14	36.10	37.85	30.99
D2	51.15	48.41	50.76	41.57
D3	51.15	48.41	50.76	41.57
A1	37.69	35.67	37.40	30.63
A2	37.69	35.67	37.40	30.63
A3	37.69	35.67	37.40	30.63
S1	36.32	34.38	36.05	29.52

DisCo 6 – Kaduna DisCo

Table 11: Fixed Charges - Kaduna DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	800	960	1,152	1,382
R3	40,029	48,035	57,641	69,170
R4	250,170	300,204	360,244	432,293
C1	800	960	1,152	1,382
C2	36,288	43,546	52,255	62,706
C3	226,797	272,156	326,587	391,905
D1	1,600	1,920	2,304	2,765
D2	223,146	267,775	321,330	385,596
D3	226,797	272,156	326,587	391,905
A1	800	960	1,152	1,382
A2	74,766	89,719	107,662	129,195
A3	100,000	120,000	144,000	172,800
S1	800	960	1,152	1,382

Table 12: Energy Charges - Kaduna DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	23.94	22.14	24.34	22.94
R3	39.73	36.76	40.40	38.08
R4	39.73	36.76	40.40	38.08
C1	27.25	25.21	27.71	26.12
C2	36.93	34.17	37.55	35.39
C3	36.93	34.17	37.55	35.39
D1	29.80	27.57	30.30	28.56
D2	38.72	35.82	39.36	37.10
D3	38.72	35.82	39.36	37.10
A1	28.53	26.39	29.00	27.34
A2	28.53	26.39	29.00	27.34
A3	28.53	26.39	29.00	27.34
S1	24.17	22.36	24.57	23.16

DisCo 7 – Kano DisCo

Table 13: Fixed Charges - Kano DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	667	800	960	1,152
R3	30,031	36,038	43,245	51,894
R4	156,407	187,689	225,227	270,272
C1	667	800	960	1,152
C2	27,225	32,670	39,204	47,045
C3	141,795	170,154	204,184	245,021
D1	867	1,040	1,248	1,498
D2	139,512	167,414	200,897	241,077
D3	141,795	170,154	204,184	245,021
A1	667	800	960	1,152
A2	62,521	75,025	90,030	108,036
A3	83,361	100,033	120,039	144,047
S1	867	1,040	1,248	1,498

Table 14: Energy Charges - Kano DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	23.65	21.41	23.12	21.67
R3	38.12	34.51	37.26	34.93
R4	38.12	34.51	37.26	34.93
C1	25.80	23.36	25.22	23.65
C2	35.43	32.08	34.63	32.47
C3	35.43	32.08	34.63	32.47
D1	28.59	25.88	27.95	26.20
D2	37.14	33.62	36.31	34.04
D3	37.14	33.62	36.31	34.04
A1	27.37	24.78	26.75	25.08
A2	27.37	24.78	26.75	25.08
A3	27.37	24.78	26.75	25.08
S1	21.01	19.02	20.54	19.26

DisCo 8 – Eko DisCo

Table 15: Fixed Charges - Eko DisCo

FIXED CHARGES ₺/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	750	900	1,080	1,296
R3	31,898	38,278	45,933	55,120
R4	136,655	163,986	196,783	236,140
C1	750	900	1,080	1,296
C2	22,170	26,604	31,924	38,309
C3	118,501	142,202	170,642	204,770
D1	905	1,085	1,302	1,563
D2	116,594	139,912	167,895	201,474
D3	118,501	142,202	170,642	204,770
A1	750	900	1,080	1,296
A2	52,250	62,700	75,240	90,288
A3	58,438	70,125	84,150	100,980
S1	750	900	1,080	1,296

Table 16: Energy Charges - Eko DisCo

ENERGY CHARGES ₺/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	19.12	18.26	17.61	16.61
R3	29.02	27.72	26.72	25.21
R4	29.02	27.72	26.72	25.21
C1	19.39	18.51	17.85	16.84
C2	26.97	25.76	24.83	23.43
C3	26.97	25.76	24.83	23.43
D1	21.76	20.79	20.04	18.91
D2	28.28	27.00	26.03	24.57
D3	28.28	27.00	26.03	24.57
A1	20.83	19.90	19.18	18.10
A2	20.83	19.90	19.18	18.10
A3	20.83	19.90	19.18	18.10
S1	16.00	15.28	14.73	13.90

DisCo 9- Ikeja DisCo

Table 17: Fixed Charges - Ikeja DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	750	900	1,080	1,296
R3	26,269	31,523	37,827	45,393
R4	164,174	197,009	236,410	283,692
C1	750	900	1,080	1,296
C2	23,814	28,577	34,292	41,151
C3	148,835	178,602	214,323	257,188
D1	1,000	1,200	1,440	1,728
D2	195,252	234,303	281,163	337,396
D3	198,447	238,137	285,764	342,917
A1	750	900	1,080	1,296
A2	43,125	51,750	62,100	74,520
A3	65,625	78,750	94,500	113,400
S1	650	780	936	1,123

Table 18: Energy Charges - Ikeja DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	17.02	15.83	14.89	13.69
R3	29.86	27.76	26.11	24.01
R4	29.86	27.76	26.11	24.01
C1	22.64	21.05	19.80	18.21
C2	27.76	25.81	24.27	22.32
C3	27.76	25.81	24.27	22.32
D1	22.40	20.82	19.58	18.01
D2	29.09	27.05	25.44	23.40
D3	29.09	27.05	25.44	23.40
A1	21.44	19.93	18.75	17.24
A2	21.44	19.93	18.75	17.24
A3	21.44	19.93	18.75	17.24
S1	16.46	15.31	14.40	13.24

DisCo 10 – Port Harcourt DisCo

Table 19: Fixed Charges – Port Harcourt DisCo

FIXED CHARGES ₦/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	700	840	1,008	1,210
R3	35,025	42,030	50,436	60,524
R4	164,174	197,009	236,410	283,692
C1	700	840	1,008	1,210
C2	31,752	38,102	45,723	54,867
C3	148,835	178,602	214,323	257,188
D1	980	1,176	1,411	1,693
D2	146,439	175,727	210,873	253,047
D3	148,835	178,602	214,323	257,188
A1	980	1,176	1,411	1,693
A2	65,625	78,750	94,500	113,400
A3	87,500	105,000	126,000	151,200
S1	980	1,176	1,411	1,693

Table 20: Energy Charges – Port Harcourt DisCo

ENERGY CHARGES ₦/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	26.81	24.70	26.60	22.83
R3	44.10	40.64	43.75	37.56
R4	44.10	40.64	43.75	37.56
C1	32.42	29.87	32.16	27.61
C2	40.99	37.78	40.67	34.91
C3	40.99	37.78	40.67	34.91
D1	44.10	40.64	43.75	37.56
D2	42.97	39.60	42.63	36.60
D3	42.97	39.60	42.63	36.60
A1	31.66	29.18	31.41	26.97
A2	31.66	29.18	31.41	26.97
A3	42.22	38.90	41.88	35.95
S1	32.42	29.87	32.16	27.61

DisCo 11 – Yola DisCo

Table 21: Fixed Charges – Yola DisCo

FIXED CHARGES ₺/MONTH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	-	-	-	-
R2	750	900	1,080	1,296
R3	24,205	29,046	34,855	41,826
R4	151,274	181,529	217,835	261,402
C1	750	900	1,080	1,296
C2	21,943	26,331	31,598	37,917
C3	137,141	164,569	197,483	236,980
D1	750	900	1,080	1,296
D2	134,933	161,920	194,304	233,165
D3	137,141	164,569	197,483	236,980
A1	750	900	1,080	1,296
A2	44,688	53,625	64,350	77,220
A3	60,469	72,563	87,075	104,490
S1	750	900	1,080	1,296

Table 22: Energy Charges – Yola DisCo

ENERGY CHARGES ₺/KWH				
TARIFF CODE DETAILS				
	2015	2016	2017	2018
R1	4.00	4.00	4.00	4.00
R2	27.36	24.74	26.99	24.59
R3	41.43	37.46	40.87	37.24
R4	41.43	37.46	40.87	37.24
C1	32.61	29.49	32.17	29.31
C2	38.51	34.82	37.99	34.61
C3	38.51	34.82	37.99	34.61
D1	32.61	29.49	32.17	29.31
D2	40.36	36.50	39.82	36.28
D3	40.36	36.50	39.82	36.28
A1	31.92	28.86	31.49	28.69
A2	31.92	28.86	31.49	28.69
A3	31.92	28.86	31.49	28.69
S1	29.18	26.39	28.79	26.23

出所 : NERC

Annex 9 b Current Status of the Power Sector Companies

As core companies among the power sector companies, overview of the business conditions of the Transmission Company of Nigeria (TCN) and the Nigerian Bulk Electricity Trading PLC (NBET), generation companies (GenCos), distribution companies (DisCos) are described below:

(1) Current Status of TCN

(a) Profit/loss statement

Profit/loss statements of TCN during 2014-2016 are shown in Table A9b. TCN has suffered large operating losses despite increases in revenue as cost of sales and administration cost increase as well. Considering results of the financial analysis of the Master Plan, insufficient revenue can be pointed as the cause of the problem. It is necessary for the transmission sector, as an integral part the power sector, with the distribution and the generation sector, to build-up the system with which sufficient electricity meeting the demand is provided, the electricity charges are properly collected from the customers and the collected charges are appropriately distributed the distribution, the generation and the transmission sector.

Table A9b. 1 Profit/Loss Statement of TCN

(NGN thousand)			
Year	2016	2015	2014
Revenue	83,554,144	72,792,084	50,365,852
Cost of sales	26,703,123	15,525,341	16,206,183
Gross Profit	56,851,021	57,266,743	34,159,669
Administrative expense	78,635,446	65,857,877	65,704,663
Other income	1,709,006	1,218,835	2,146,977
Operating Profit (Loss)	-20,075,419	-7,372,299	-29,398,017
Finance Income	16,621	1,072,503	2,529,854
Finance cost	11,405,079	5,749,898	2,069,821
Profit (Loss) before tax	-31,463,877	-12,049,694	-28,937,984
<i>(In USD thousand (1 US\$=Nira200))</i>	<i>-157,319</i>	<i>-60,248</i>	<i>-160,767</i>

Source: JICA Study Team from data of TCN

(b) Balance sheet

The balance sheets of TCN during 2014-2016 are shown in Table A9b. 2. The amount of assets largely exceeded that of liabilities. It can be said that TCN has a solid financial foundation. The foundation, however, is not based on the revenue, but is established by capital contribution from the federal government.

Table A9b. 2 Balance Sheet of TCN

(NGN thousand)

	2016	2015	2014
Assets			
Non current assets			
Property, plant and equipment	534,926,680	518,921,537	514,878,247
Deferred tax assets		2,860,026	
Total non current assets	534,926,680	521,781,563	514,878,247
Current assets			
Inventories	9,227,103	9,478,343	10,005,304
Trade and other receivables	67,322,139	59,090,107	67,515,727
Cash and cash equivalent	75,949,925	44,783,166	34,358,165
Total current assets	152,499,167	113,351,616	111,879,196
Total assets	687,425,847	635,133,179	626,757,443
Liabilities			
Non current liabilities			
Borrowings	92,791,098	59,430,014	46,799,326
Deferred tax liabilities	72,285,500		
Total non current liabilities	165,076,598	59,430,014	46,799,326
Current liabilities			
Trade and other payables	42,937,133	21,793,414	26,128,868
Current tax liabilities	21,684,095	11,624,278	11,624,278
Total current liabilities	64,621,228	33,417,692	37,753,146
Total liabilities	229,697,826	92,847,706	84,552,472
Equity			
Ordinary share capital	5,000	5,000	5,000
Capital contribution	259,652,514	227,436,094	218,165,924
Retained earnings	198,070,507	314,844,379	324,034,047
Total equity	457,728,021	542,285,473	542,204,971
Total equity and liabilities	687,425,847	635,133,179	626,757,443

Source: JICA Study Team from data of TCN

(2) NBET**(a) Profit/loss statement**

The available latest three-year profit/loss statements of NBET are shown in Table A9b. 3. According to the NBET, which is established in 2011, had started a full-scale operation since February 2015. Therefore, the financial statement shown below are those of the preparatory stage. The operating expenses had exceeded the revenue more than two times, and major operating losses were recorded.

Table A9b. 3 Profit/Loss Statement of NBET

Unit: NGN thousand

	2013	2012	2011
Revenue	377,134	190,401	
Other income	1,050	15	
Total income	378,184	190,416	0
Administrative and general expenses	-409,726	-268,581	
Payroll and related costs	-309,740	-166,326	
Depreciation and amortization	-45,034	-19,237	
Operating expenses	-764,500	-454,144	-56,961
Operating loss	-386,316	-263,728	-56,961
Finance income	3,122	552	
Finance costs	-297	-93	
Loss for the year	-383,491	-263,269	-56,961
Total comprehensive loss for the year	-383,491	-263,269	-56,961
Loss per share(Naira)	-19.17	-13.16	

Source: JICA Study Team from data of NBET

(b) Balance Sheet

The balance sheets of the most recent available three years of NBET are shown in Table A9b. 4. By contributions and power trading capital fund by the federal government, the capital had been accumulated generously, and the financial base was good. Power trading capital represents funds appropriated to NBET to enable it carry out its mandate as per the Electric Power Sector Reform Act and as laid out in the Power Sector Roadmap.

Table A9b. 4 Balance Sheet of NBET

Unit:1,000N

	2013	2012	2011
ASSETS			
Non-Current Assets			
Property,plant and equipment	175,255	135,668	
Intangible assets	13,772	17,895	12,100
	189,027	153,563	12,100
Current Assets			
Trade and other receivables	6,240	198,494	64,667
Financial assets - held to maturity	1,768,348		
Cash and cash equivalents	14,359,154	8,891,940	279,036
	16,133,742	9,090,434	343,703
TOTAL ASSETS	16,322,769	9,243,997	355,803
EQUITY AND LIABILITIES			
Equity attributable to shareholders			
Share capital	10,000	10,000	10,000
Contribution by the Federal Government	1,219,649	664,091	381,250
Power trading capital	15,717,672	8,868,888	
Accumulated losses	-703,721	-320,230	-56,961
TOTAL EQUITY	16,243,600	9,222,749	334,289
Current liabilities			
Trade and other payables	79,169	21,248	21,514
TOTAL LIABILITIES	79,169	21,248	21,514
TOTAL EQUITY AND LIABILITIES	16,322,769	9,243,997	355,803

Source: JICA Study Team from data of NBET

(c) Statement of Cash Flows

Cash flow statements of the available latest three years of NBET are shown in Table A9b. 5. Net cash used in operating activities was negative. Due to large cash flows from financing activities, such as buildup of contributions and power trading capital from the federal government, cash and cash equivalents had been greatly accumulated.

Table A9b. 5 Statement of Cash Flows of NBET

Unit:1,000N

	2013	2012	2011
Cash flows from operating activities			
Cash generated used in operation	-88,283	-378,124	-99,909
Net cash flow used in operating activities	-88,283	-378,124	-99,909
Cash flows from investing activities			
Acquisition of property, plant and equipment	-80,497	-152,026	
Acquisition of intangible asset		-8,675	-12,305
Investment in Nigerian treasury bills	-1,768,348		
Net cash flow used in investing activities	-1,848,845	-160,701	-12,305
Cash flow from financing activities			
Proceeds from issue of shares			10,000
Contribution from Federal Government	555,558	282,841	381,250
Power trading capital received during the year	6,848,784	8,868,888	
Net cash generated from financing activities	7,404,342	9,151,729	391,250
Increase in cash and cash equivalents	5,467,214	8,612,904	279,036
Cash and cash equivalents at start of year	8,891,940	279,036	
Cash and cash equivalents at end of year	14,359,154	8,891,940	279,036

Source: JICA Study Team from data of NBET

(3) Generation Companies (GenCos)

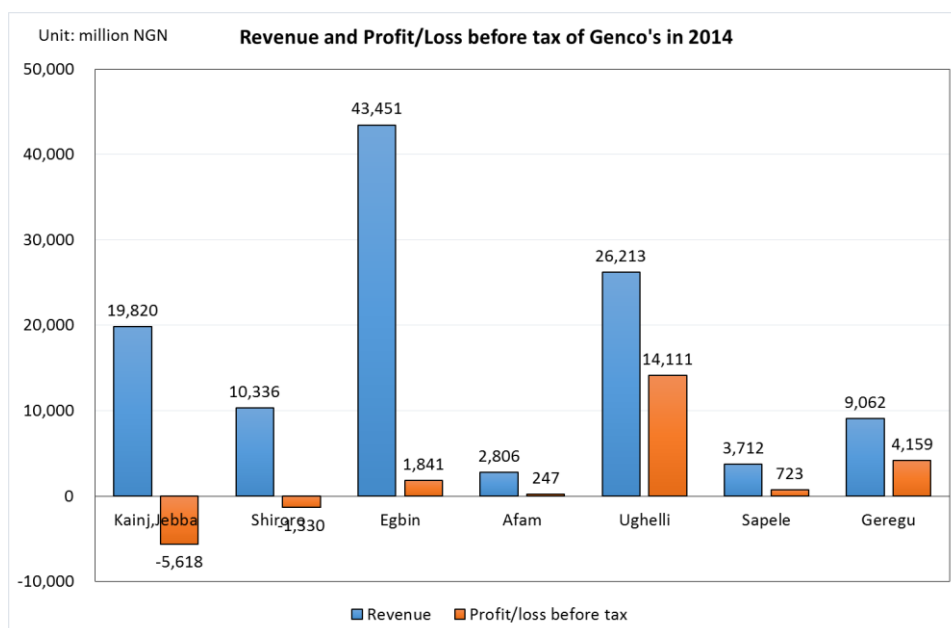
(a) Profit/loss Statement

The table below summarizes the sales and profit/loss before tax of GenCos during 2013-2015. Each company tended to have large fluctuations in revenue depending on the fiscal year. There was a big difference in profitability depending on the company. There was a tendency that a stable profit structure could not be established as a whole. The average profit margin for fiscal 2014 was 12.2%.

Table A9b. 6 Sales and Profit/Loss before Tax of GenCos

Unit: Million NGN

	2015			2014			2013		
	Revenue	Profit/loss before tax	Profit margin on sales	Revenue	Profit/loss before tax	Profit margin on sales	Revenue	Profit/loss before tax	Profit margin on sales
Mainstream Energy Solutions Limited(Kainj,Jebba)	23,398	-10,596	-45.3%	19,820	-5,618	-28.3%	3,700	-1,663	-45.0%
North South Power Company Limited(Shiroro)	11,990	-2,582	-21.5%	10,336	-1,330	-12.9%	3,965	1,988	50.1%
Egbin Power PLC	51,587	-10,588	-20.5%	43,451	1,841	4.2%	58,036	18,777	32.4%
Afam Power PLC	81	-832	-1023.6%	2,806	247	8.8%	3,012	-932	-31.0%
Transcorp Power Limited(Ughelli Power PLC)	26,647	1,003	3.8%	26,213	14,111	53.8%	14,860	6,951	46.8%
Sapele Power PLC				3,712	723	19.5%			
Geregu Power PLC	10,268	3,570	34.8%	9,062	4,159	45.9%	1,679	718	42.7%
Genco Total	123,972	-20,027	-16.2%	115,400	14,134	12.2%	85,252	25,838	30.3%



Source: JICA Study Team from data of NERC

Figure A9b. 1 Sales and Profit/Loss before Tax of GenCos

(b) Balance Sheet

The following table summarizes the gross capital and owned capital of GenCo. Apart from Mainstream Energy Solutions Limited, capital adequacy tended to be substantial. The average capital adequacy ratio in FY 2014 was 50.5%.

Table A9b. 7 Gross Capital and Owned Capital of Generation Companies

	2015			2014		
	Gross Capital	Owned Capital	Capital Adequacy Ratio	Gross Capital	Owned Capital	Capital Adequacy Ratio
Mainstream Energy Solutions Limited(Kainj,Jebba)	100,135	4,628	4.6%	88,874	-4,941	-5.6%
Shiroro Hydro Power PLC			#DIV/0!			#DIV/0!
Egbin Power PLC			#DIV/0!			#DIV/0!
Afam Power PLC	19,743	16,466	83.4%	20,216	17,199	85.1%
Ughelli Power PLC			#DIV/0!			#DIV/0!
Sapele Power PLC			#DIV/0!	5,268	3,408	64.7%
Geregu Power PLC			#DIV/0!	52,143	49,595	95.1%
Olorunsogo Power PLC			#DIV/0!			#DIV/0!
Omotosho Power PLC			#DIV/0!			#DIV/0!
Genco Total	119,878	21,094	17.6%	166,501	65,261	39.2%

Source: JICA Study Team from data of NERC

(4) Distribution Companies (DisCos)

(a) Income Statement

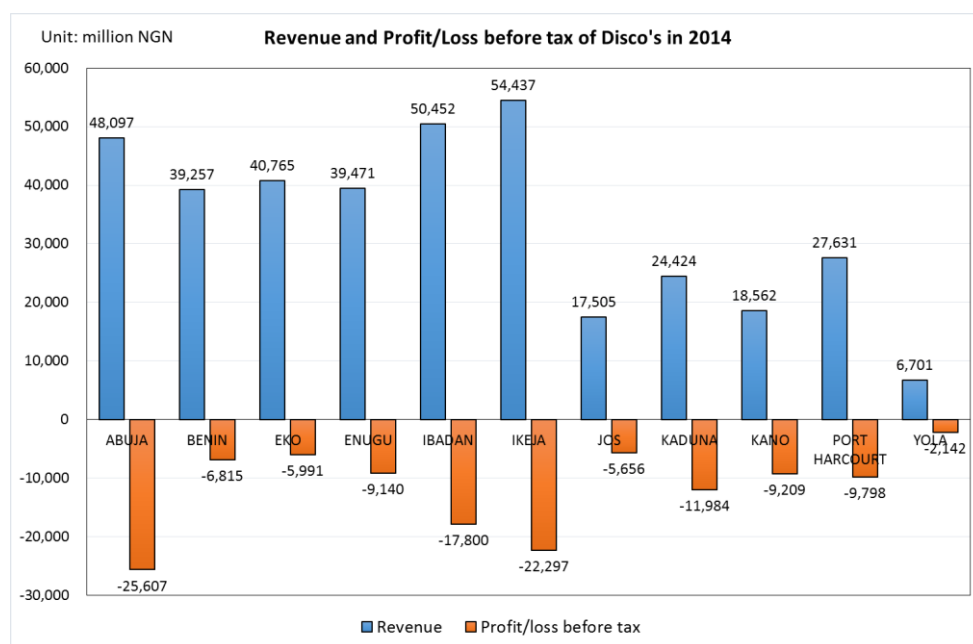
The table below summarizes the sales and profit / loss before tax of DisCos. All DisCos had operating losses, and the average profit rate of 11 companies in 2014 was -34.4% to the sales. It was not in a

situation where autonomous management could be maintained. Subsidies and so on were indispensable.

Table A9b. 8 Sales and Profit / Loss before Tax of DisCos

Unit: Million NGN

	2015			2014		
	Revenue	Profit/loss before tax	Profit margin on sales	Revenue	Profit/loss before tax	Profit margin on sales
ABUJA	62,535	-41,719	-66.7%	48,097	-25,607	-53.2%
BENIN	37,047	-4,374	-11.8%	39,257	-6,815	-17.4%
EKO	50,933	-6,126	-12.0%	40,765	-5,991	-14.7%
ENUGU	45,692	-26,427	-57.8%	39,471	-9,140	-23.2%
IBADAN	61,378	-20,060	-32.7%	50,452	-17,800	-35.3%
IKEJA	62,637	-28,311	-45.2%	54,437	-22,297	-41.0%
JOS	22,666	-8,792	-38.8%	17,505	-5,656	-32.3%
KADUNA	38,715	-8,192	-21.2%	24,424	-11,984	-49.1%
KANO	25,901	-8,896	-34.3%	18,562	-9,209	-49.6%
PORT HARCOURT				27,631	-9,798	-35.5%
YOLA				6,701	-2,142	-32.0%
Disco Total	407,503	-152,895	-37.5%	367,300	-126,438	-34.4%



JICA Study Team from data of BPE

Figure A9b. 2 Sales and Profit / Loss before Tax of DisCos

(b) Balance Sheet

The following table summarizes the gross capital and owned capital of DisCos. Capitals of the DisCos, were generally rich. The capital adequacy ratio tended to be high, and in FY 2014, the average was 58.9%.

Table A9b.9 Gross Capital and Owned Capital of DisCos

Unit: Million NGN

	2015			2014		
	Gross Capital	Owned Capital	Capital Adequacy Ratio	Gross Capital	Owned Capital	Capital Adequacy Ratio
ABUJA	109,486	36,428	33.3%	105,530	63,123	59.8%
BENIN	61,635	6,855	11.1%	49,478	11,247	22.7%
EKO	88,533	53,468	60.4%	72,403	60,226	83.2%
ENUGU	67,018	4,993	7.5%	56,714	31,420	55.4%
IBADAN	61,635	6,855	11.1%	49,478	11,247	22.7%
IKEJA	108,933	46,409	42.6%	109,980	75,205	68.4%
JOS	48,416	21,800	45.0%	44,235	30,446	68.8%
KADUNA	73,123	45,545	62.3%	86,627	33,170	38.3%
KANO	89,920	56,414	62.7%	72,006	61,469	85.4%
PORT HARCOURT				48,267	31,983	66.3%
YOLA				5,819	2,862	49.2%
Disco Total	708,699	278,767	39.3%	700,536	412,398	58.9%

Source: JICA Study Team from data of BPE