

3-6 PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLN REGION : 5

	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04
SALES (GWh)	172	79	99	124	150	218	271	329	329	459	527	602	493
GROWTH RATE (%)	21	9	23	29	29	36	24	21	18	19	19	14	12
LOSSES (GWh)	24	25	23	22	21	20	20	20	20	19	19	19	12
PROD (GWh)	95	104	122	159	203	222	239	411	433	522	551	744	844
PEAK (MW)	19	21	26	31	39	52	54	72	90	104	120	121	153
LOAD FACTOR (%)	57	57	51	53	59	50	50	61	62	62	62	62	62
INSTALLED CAP (MW)													
DIESEL	21	23	33	33	42	101	105	105	105	108	108	112	112
STDF	0	0	0	0	0	0	0	0	0	0	0	0	0
STEAD	0	0	0	0	0	0	0	0	0	20	20	20	20
HYDRO	0	0	0	0	0	0	0	0	0	30	30	30	30
HYDRO	0	0	0	0	0	0	0	0	0	0	0	0	0
G.T	0	0	0	0	0	0	0	0	0	0	0	0	0
GEOTHERM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	21	23	33	33	42	101	105	105	105	138	208	212	212

NAME OF PROJECT	TYPE	CAP (MW)	YEAR
Pontianak	STDF	2x25	91/92
Pontianak	STDF	2x10	90/91
P. Kembang	HYDRO	3x10	90/91

3-7 PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLN REGION 6

	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
SALES (GWh)	195	209	291	351	417	482	535	596	622	980	1143	1326	1551
GROWTH RATE (%)	46	18	27	21	19	16	21	19	18	19	17	17	16
LOSSES (%)	22	21	23	22	22	21	20	20	20	19	19	19	19
PROD (GWh)	253	292	378	450	535	611	731	870	1027	1210	1411	1649	1914
PEAK (MW)	53	62	78	92	108	122	144	171	201	236	274	319	369
LOAD FACTOR (%)	54	54	55	56	57	57	58	58	58	59	59	59	59
INSTALLED CAP (MW)													
DIESEL	66	71	91	87	96	165	182	196	211	226	233	235	236
STDF	0	0	0	0	0	0	0	0	0	0	0	0	0
STEAL	0	0	0	0	0	0	0	0	0	110	260	260	260
HYDR	30	30	30	30	30	30	30	30	30	72	72	72	72
MHYDR	0	0	0	0	0	0	0	0	0	0	0	0	0
G.T	0	0	0	20	20	20	20	20	20	20	20	20	20
GEOTHERM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	96	101	121	137	146	215	232	246	261	428	585	587	588

NAME OF PROJECT	TYPE	CAP (MW)	YEAR
Banjarmasin	GT	20	84/85
Balikpapan	STCO	2x50	91/92
Banjarmasin	STCO	2x30	90/91
Loskulu #1	STCO	50	90/91
Loskulu #2	STCO	50	91/92
Riam Kiva #1-2	HYDR	2x21	90/91

3-8 PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLN REGION 7

	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
SALES (GWH)	105	116	143	169	203	252	297	350	401	459	521	606	686
GROWTH RATE (%)	24	11	22	19	20	24	18	18	14	17	13	14	13
LOSSES (%)	29	28	25	25	23	21	20	20	20	19	19	19	19
PROD (GWH)	147	162	190	225	284	319	271	438	501	579	656	749	847
PEAK (MW)	35	38	43	49	56	66	77	89	101	115	130	146	165
LOAD FACTOR (%)	48	48	51	53	54	55	55	56	57	58	58	59	59
INSTALLED CAP (MW)													
DIESEL	40	52	52	55	63	100	110	113	125	131	129	149	147
STDF	0	0	0	0	0	0	0	0	0	0	0	0	0
STDFAL	0	0	0	0	0	0	0	0	0	0	0	0	0
HYDRO	14	14	14	14	14	31	31	31	31	47	47	47	47
HYDRO	0	1	1	1	1	1	1	1	1	1	1	1	1
G.T	0	0	0	0	0	0	0	0	0	0	0	0	0
GEOTHERM	0	0	0	0	0	0	0	0	0	30	30	30	30
TOTAL	55	68	68	70	79	133	142	145	159	208	207	226	225

NAME OF PROJECT	TYPE	CAP (MW)	YEAR
Lahandong	GEN	30	90/91
Tangsari #1-2	HYDRO	2x8.5	86/87
Tangsari #3-4	HYDRO	2x7.6	90/91

3-9 PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLN REGION 8

	81/83	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
SALES (GWh)	179	192	238	374	494	647	841	1044	1175	1312	1449	1606	1774
GROWTH RATE (%)	20	8	42	30	32	21	20	24	13	12	10	11	10
LOSSES (%)	25	27	21	21	20	20	20	20	19	19	19	19	19
PROD. (GWh)	237	265	265	473	617	808	1051	1306	1451	1621	1729	1982	2190
PEAK (MW)	50	61	79	99	126	161	205	249	277	307	339	376	416
LOAD FACTOR (%)	54	50	53	54	55	57	58	50	50	50	50	50	50
INSTALLED CAP (MW)													
DIESEL	33	36	42	65	89	120	136	143	151	157	160	169	174
STDF	25	25	25	25	25	25	25	25	25	25	25	25	25
STCOAL	0	0	0	0	0	0	0	0	0	0	0	0	0
HYDRO	2	2	2	2	2	2	128	128	191	191	254	254	254
WYDRO	0	0	0	0	0	0	0	0	0	0	0	0	0
G.T	14	14	54	54	54	54	54	54	54	54	54	54	40
GEOTHERM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	73	77	123	146	170	201	342	350	421	427	492	502	493

NAME OF PROJECT	TYPE	CAP (MW)	YEAR
Ujung Pandang #1-2	GT	2x20	82/84
Bakau #1-2	HYDRO	2x63	87/88
Bakau #3	HYDRO	63	89/90
Bakau #4	HYDRO	63	91/92

3-10 PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLN REGION : 8

	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
SALES (GMH)	21	34	46	64	82	105	129	154	182	217	255	296	342
GROWTH RATE (%)	23	13	34	39	27	29	23	19	18	19	17	16	15
LOSSES (%)	27	27	25	21	21	20	20	20	20	19	19	19	19
PROD (GMH)	42	47	62	82	103	131	151	193	228	268	314	366	422
PEAK (MW)	9	11	13	17	21	26	32	38	44	52	61	70	81
LOAD FACTOR (%)	52	51	55	56	57	58	59	59	59	59	59	59	60
INSTALLED CAP (MW)													
DIESEL	11	14	28	40	42	62	63	73	77	86	103	109	111
STDF	0	0	0	0	0	0	0	0	0	0	0	0	0
STGAL	0	0	0	0	0	0	0	0	0	0	0	0	0
HYDR	0	0	0	0	0	0	0	0	0	0	0	0	0
MHYDR	0	0	0	0	0	0	0	0	0	0	0	0	0
G.T	0	0	0	0	0	0	0	0	0	0	0	0	0
GEUTHERM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	11	14	28	40	42	62	63	73	77	86	102	109	111

3-11 PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLK REGION : 10

	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
SALES (MM)	44	48	62	73	86	110	138	163	187	213	239	269	301
GROWTH RATE (%)	11	9	28	18	18	28	25	18	15	14	12	12	12
LOSSES (%)	20	21	17	17	17	17	17	17	17	17	17	17	17
PROD (MM)	55	61	74	88	104	133	166	196	225	256	288	324	363
PEAK (MW)	11	12	15	17	20	26	32	38	43	49	55	62	69
LOAD FACTOR (%)	56	56	58	58	58	59	59	59	59	59	60	60	60
INSTALLED CAP (MM)													
DIESEL	16	17	20	20	26	55	55	54	55	59	61	66	70
STDF	0	0	0	0	0	0	0	0	0	0	0	0	0
STORAL	0	0	0	0	0	0	0	0	0	0	0	0	0
HYDR0	0	0	0	0	0	0	0	0	13	13	13	26	26
HYDR0	0	0	0	0	0	0	0	0	0	0	0	0	0
G.T	0	0	0	0	0	0	0	0	0	0	0	0	0
GEOTRERN	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	16	17	20	20	26	55	56	54	58	72	74	92	96

NAME OF PROJECT	TYPE	CAP (MM)	YEAR
Sentani I #1-2	HYDR0	2x 6.5	82/90
Sentani II #1-2	HYDR0	2x 6.5	92/93

3-12 PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLN REGION 1, 11

	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
SALES (GWh)	151	166	243	305	382	468	566	674	789	906	1026	1149	1288
GROWTH RATE (R)	13	10	48	25	25	23	21	19	17	15	13	12	12
LOSSES (R)	18	20	17	17	17	17	17	17	17	17	17	17	17
PROD (GWh)	184	209	293	367	460	563	681	812	950	1092	1237	1388	1552
PEAK (MW)	42	48	63	77	94	114	135	160	185	211	239	269	301
LOAD FACTOR (%)	50	50	53	54	56	57	58	58	59	59	59	59	59
INSTALLED CAP (MW)													
DIESEL	54	74	92	120	131	180	178	177	177	196	201	214	222
STOF	0	0	0	0	0	0	0	0	0	0	0	0	0
STOGL	0	0	0	0	0	0	0	0	0	0	0	0	0
HYDRO	0	0	0	0	0	0	0	0	0	0	0	0	0
HYDRO	0	0	0	0	0	0	0	0	0	0	0	0	0
G.T	0	0	0	20	20	20	20	20	20	20	20	20	20
GEOTHERM	0	0	0	0	0	0	0	0	0	55	55	55	55
TOTAL	54	74	92	140	152	200	198	197	197	271	277	289	297

NAME OF PROJECT	TYPE	CAP (MW)	YEAR
Bali	GT	20	84/87
Bratan	GED	55	90/91

Electricity Basic Tariff of 1984

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and government operations. The text highlights how detailed records can help identify inefficiencies, prevent fraud, and ensure that resources are used effectively.

2. The second part of the document focuses on the role of technology in modern record-keeping. It explores how digital systems and software solutions can streamline the process of data collection, storage, and retrieval. The author notes that while technology offers significant advantages, it also presents challenges such as data security, system integration, and the need for staff training. The text suggests that a balanced approach, combining traditional methods with modern technology, is often the most effective solution.

3. The third part of the document addresses the legal and ethical considerations surrounding record-keeping. It discusses the importance of ensuring that records are maintained in accordance with applicable laws and regulations. The text also touches upon the ethical implications of data collection and storage, particularly regarding privacy and the potential for misuse of information. The author argues that organizations must have clear policies and procedures in place to address these concerns and ensure that they are acting in a responsible and lawful manner.

4. The fourth part of the document provides practical advice for implementing a robust record-keeping system. It offers a step-by-step guide, starting with the identification of key areas and data points that need to be tracked. The text then discusses the selection of appropriate software and hardware, the design of the system, and the implementation process. The author emphasizes the importance of involving all relevant stakeholders throughout the process to ensure buy-in and successful adoption.

5. The final part of the document concludes by summarizing the key points and reiterating the importance of record-keeping. It encourages organizations to view record-keeping not as a mere administrative task, but as a strategic tool for improving performance and ensuring long-term success. The text ends with a call to action, urging readers to take the steps necessary to implement a strong record-keeping system in their own organizations.

TABLE OF TARIFF SCHEDULE 1984

(EFFECTIVE : MARCH 1984)

US.\$ 1 = Rp 1,000.-

No.	Code of Tariff	Contracted Power	Demand Charge Rp/kVA	Energy Charge Rp/kWh	Projected Average Revenue Rp./kWh
1.	S ₁	to 200 VA	*)		
2.	S ₂	250 VA to 200 kVA	2,100	43.50	60.57
3.	R ₁	250 VA to 500 VA	2,100	70.50	85.19
4.	R ₂	501 VA to 2200 VA	2,100	84.50	98.41
5.	R ₃	2201 VA to 6600 VA	3,680	126.50	156.42
6.	R ₄	6601 VA & Over	3,680	158	184.10
7.	U ₁	250 VA to 2200 VA	3,680	134	160.10
8.	U ₂	2201 VA to 200 kVA	3,680	150	185.75
9.	U ₃ /MV	201 kVA & Over	2,300	P = 158 OP = 99	123.17
10.	U ₄	-	-	307	307
11.	I ₁	Up to 99 kVA	2,300	P = 106 OP = 66	93.97
12.	I ₂	100 kVA to 200 kVA	2,300	P = 100 OP = 62.50	85.51
13.	I ₃ /MV	201 kVA & Over	2,100	P = 96.50 OP = 60.50	75.88
14.	I ₄ /HV	5000 kVA & Over	1,970	P = 81.50 OP = 52	61.13
15.	G ₁	250 VA to 200 kVA	3,680	96	120.86
16.	G ₂ /MV	201 kVA & Over	1,970	P = 99 OP = 65	84.92
17.	J	-	-	76.50	76.50
Average					98.515

*) Tariff S₁ : 100 VA = Rp 2,510.-/month
 150 VA = Rp 3,765.-/month
 200 VA = Rp 5,025.-/month

Note : P = Peak Hours (18.00 - 22.00)
 OP = Off Peak Hours (22.00 - 18.00)

THE EXPLANATION OF THE TARIFF CATEGORY

ON BASIC TARIFFS OF ELECTRICITY 1984

No.	CODE TARIFF	CONTRACTED POWER	THE EXPLANATION OF THE TARIFF CATEGORY
1.	S1	to 200 VA	Tariff S ₁ for Small Consumer (Low Voltage)
2.	S2	250 VA to 200 kVA	Tariff S ₂ for Social Institutions (Low Voltage)
3.	R1	250 VA to 500 VA	Tariff R ₁ for Simple Residential Service (Low Voltage)
4.	R2	501 VA to 2200 VA	Tariff R ₂ for Small Residential Service (Low Voltage)
5.	R3	2201 VA to 6600 VA	Tariff R ₃ for Medium Residential Service (Low Voltage)
6.	R4	6601 VA & Over	Tariff R ₄ for Big Residential Service (Low Voltage)
7.	U ₁	250 VA to 2200 VA	Tariff U ₁ for Small Commercial Service (Low Voltage)
8.	U ₂	2201 VA to 200 kVA	Tariff U ₂ for Medium Commercial Service (Low Voltage)
9.	U ₃ /MV	201 kVA & Over	Tariff U ₃ /MV for Big Commercial Service (Medium Voltage)
10.	U ₄	-	Tariff U ₄ for Temporary Service (Low Voltage)
11.	I ₁	Up to 99 kVA	Tariff I ₁ for Industrial & Hotel Service (Low Voltage)
12.	I ₂	100 kVA to 200 kVA	Tariff I ₂ for Industrial & Hotel Service (Low Voltage)
13.	I ₃ /MV	201 kVA & Over	Tariff I ₃ /MV for Industrial & Hotel Service (Medium Voltage)
14.	I ₄ /HV	5000 kVA & Over	Tariff I ₄ /HV for Industrial Service (High Voltage)
15.	G ₁	250 VA to 200 kVA	Tariff G ₁ for Office Service (Low Voltage)
16.	G ₂ /MV	201 kVA & Over	Tariff G ₂ /MV for Office Service (Medium Voltage)
17.	J		Tariff J for Street Lighting Service (Low Voltage)

Jakarta, 1st March 1984

EXAMPLES OF BILL CALCULATIONS

(base on the Basic Tariff 1984)

Rate : US.\$ 1 = Rp 1,000.-

1. A Simple Residential consumer of R₁ tariff has a contracted power 450 VA and the energy consumption are 75 kWh per month.

Bill calculations :

$$\begin{aligned} \text{Demand charge} & : \frac{450}{1000} \text{ kVA} \times \text{Rp } 2,100.-/\text{kVA} = \text{Rp } 945.- \\ \text{Energy charge} & : 75 \text{ kWh} \times \text{Rp } 70.50/\text{kWh} = \text{Rp } 5,287.5 \\ \text{T o t a l} & : \underline{\hspace{10em}} = \text{Rp } 6,232.5 \end{aligned}$$

The total monthly Electric Bill is 6,232.5 Rupiah.

2. A Big Residential consumer of R₄ tariff has a contracted power 13,200 VA, and the energy consumption are 2,000 kWh per month.

Bill calculations :

$$\begin{aligned} \text{Demand charge} & : \frac{13,200}{1000} \text{ kVA} \times \text{Rp } 3,680.-/\text{kVA} = \text{Rp } 48,576.- \\ \text{Energy charge} & : 2,000 \text{ kWh} \times \text{Rp } 158.-/\text{kWh} = \text{Rp } 316,000.- \\ \text{T o t a l} & : \underline{\hspace{10em}} = \text{Rp } 364,576.- \end{aligned}$$

The total monthly Electric Bill is 364,576 Rupiah.

3. A Shopping Centre of U₃/MV tariff (Big Commercial) has a contracted power 520 kVA and the energy consumption : Off peak = 60,600 kWh, peak = 20,000 kWh.

Bill calculations :

$$\begin{aligned} \text{Demand charge} & : 520 \times \text{Rp } 2,300.- = \text{Rp } 1,196,000.- \\ \text{Energy charge} & \\ \quad \text{Off peak} & : 60,600 \times \text{Rp } 99.- = \text{Rp } 5,999,400.- \\ \quad \text{P e a k} & : 20,000 \times \text{Rp } 158.- = \text{Rp } 3,160,000.- \\ \text{T o t a l} & : \underline{\hspace{10em}} = \text{Rp } 10,355,400.- \end{aligned}$$

The total monthly Electric Bill is 10,355,400 Rupiah.

4. A Textile Factory of I₃/MV tariff (Big Industrial) has a contracted power 2,500 kVA, and the energy consumptions : Off peak = 652,000 - kWh, peak = 125,000 kWh.

Bill calculations :

Demand charge	:	2500 x Rp 2,100.-	=	Rp 5,250,000.-
Energy charge				
Off peak	:	625,000 x Rp 60.50	=	Rp 37,812,500.-
P e a k	:	125,000 x Rp 96.50	=	Rp 12,062,500.-
				<hr/>
T o t a l	:		=	Rp 55,125,000.-

The total monthly Electric Bill is 55,125,000.- Rupiah.

Note : The above Bill calculation has not yet been added with :

- a. The local Government tax (Retributions for Street Lighting) , the tax is difference for one to another Province, for example in West Java it is Rp 1.00 per kWh, in Padang (Sumatera) it is Rp 2.00 per kWh.

While in Jakarta the tax is depend upon the tariff category , for example for R₁ tariff the tax is Rp 1.75 per kWh, R₄ tariff the tax is Rp 3.50 per kWh, U₃ tariff the tax is Rp 3.50 per kWh and I₂ tariff the tax is Rp 2.50 per kWh etc.

- b. The stamps Rp 10.00 per Bill, for the Bill with the total amount less than Rp 5,000.- no stamps is needed.

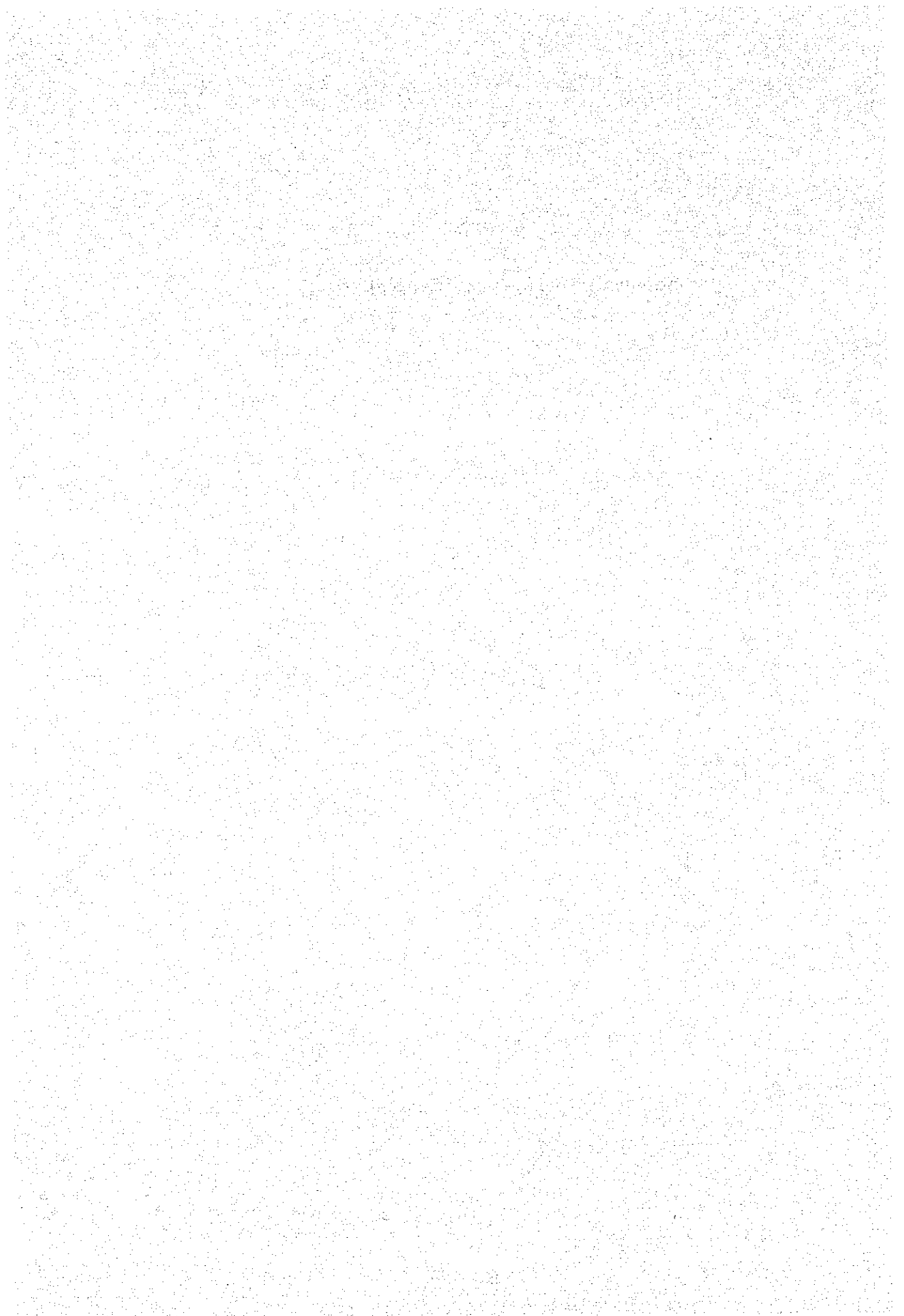
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T A R I F F S

No.	List of Tariff Categories & Voltage Supply	Tariff code	Average Revenue 1982 (Rp/kWh)	Average Revenue 1983 (Rp/kWh)	Time of Day Rates	Seasonal Rates	Demand and Energy Rates	Lifeline Rates	Fuel Cost Adjustment clause	Decreasing Block Tariff	Interruptible supply clause	Power Factor clause
1.	Small Consumer (LV)	S1	29.54	39.41	-	-	**)	-	-	-	✓	-
2.	Social Institutions (LV or MV)	S2	34.60	46.07	-	-	✓	-	-	-	✓	-
3.	Simple Residential Serv. (LV)	R1	49.08	66.27	-	-	✓	-	-	-	✓	-
4.	Small Residential Serv. (LV)	R2	56.51	75.90	-	-	✓	-	-	-	✓	-
5.	Medium Residential Serv. (LV)	R3	87.56	117.96	-	-	✓	-	-	-	✓	-
6.	Big Residential Serv. (LV)	R4	102.08	131.42	-	-	✓	-	-	-	✓	-
7.	Small Commercial Serv. (LV)	U1	85.56	117.10	-	-	✓	-	-	-	✓	-
8.	Medium Commercial Serv. (LV)	U2	99.06	132.21	-	-	✓	-	-	-	✓	-
9.	Big Commercial Serv. (MV)	U3	63.10	86.63	✓	-	✓	-	-	-	✓	✓
10.	Temporary Service (LV)	U4	165.85	204.20	-	-	***)	-	-	-	✓	-
11.	Hotel Service (LV)	H1	68.01	- *)	-	-	✓	-	-	-	✓	-
12.	Hotel Service (MV)	H2	44.86	- *)	-	-	✓	-	-	-	✓	-
13.	Small Industrial Service (LV)	I1	54.01	73.06	✓	-	✓	-	-	-	✓	✓
14.	Medium Industrial Service (LV)	I2	48.35	67.32	✓	-	✓	-	-	-	✓	✓
15.	Big Industrial Service (MV)	I3	40.15	54.84	✓	-	✓	-	-	-	✓	✓
16.	Big Industrial Service (MV)	I4	32.47	41.54	✓	-	✓	-	-	-	✓	✓
17.	Office Service (LV)	G1	65.52	88.02	-	-	✓	-	-	-	✓	-
18.	Office Service (MV)	G2	46.07	62.93	✓	-	✓	-	-	-	✓	✓
19.	Street Lighting Service (LV)	J	42.42	56.58	-	-	***)	-	-	-	✓	-
	Total Average		54.01	72.36								

Notes : *) In Basic Tariff 1983 H1 and H2 tariffs to be grouped in the industrial tariff I1 and I2
 **) Fixed Charge tariff (The consumption based on statistical utilization hours, namely 500 hours per month)
 ***) Only energy Charge.

Economic Indices in Central Sumatera



ECONOMY

From the economic point of view and despite the recent industrial development owing, in particular, to the enormous natural gas and petroleum resources of SUMATRA, agriculture remains the chief economic activity of the Island employing more than two thirds (2/3) of the working population.

The following table gives the gross regional domestic product for the eight (8) provinces of SUMATRA, broken down according to major sectors : agriculture, industry - mines - construction, service industries (electricity and water , transportation and communications, trade, banks, civil service).
(see table overleaf)

GROSS REGIONAL DOMESTIC PRODUCT AT CURRENT MARKET PRICE (1979)

IN 10⁹ RP

PROVINCE	AGRICULTURE	INDUSTRY	SERVICE INDUSTRIES	TOTAL
D.I. ACEH	225.1	585.9	102.4	913.4
SUMATRA UTARA	660.0	383.9	595.4	1639.3
SUMATRA BARAT	(82.0) *	(21.3) *	(84.9) *	(188.2) *
RIAU	129.6	2708.3	267.5	3105.4
JAMBI	140.7	51.4	81.0	273.1
SUMATRA SELATAN	326.2	790.7	440.5	1557.5
BENGGULU	49.5	10.7	34.5	94.7
LAMPUNG	328.2	54.3	245.4	627.9

* 1975 Current Market Prices.

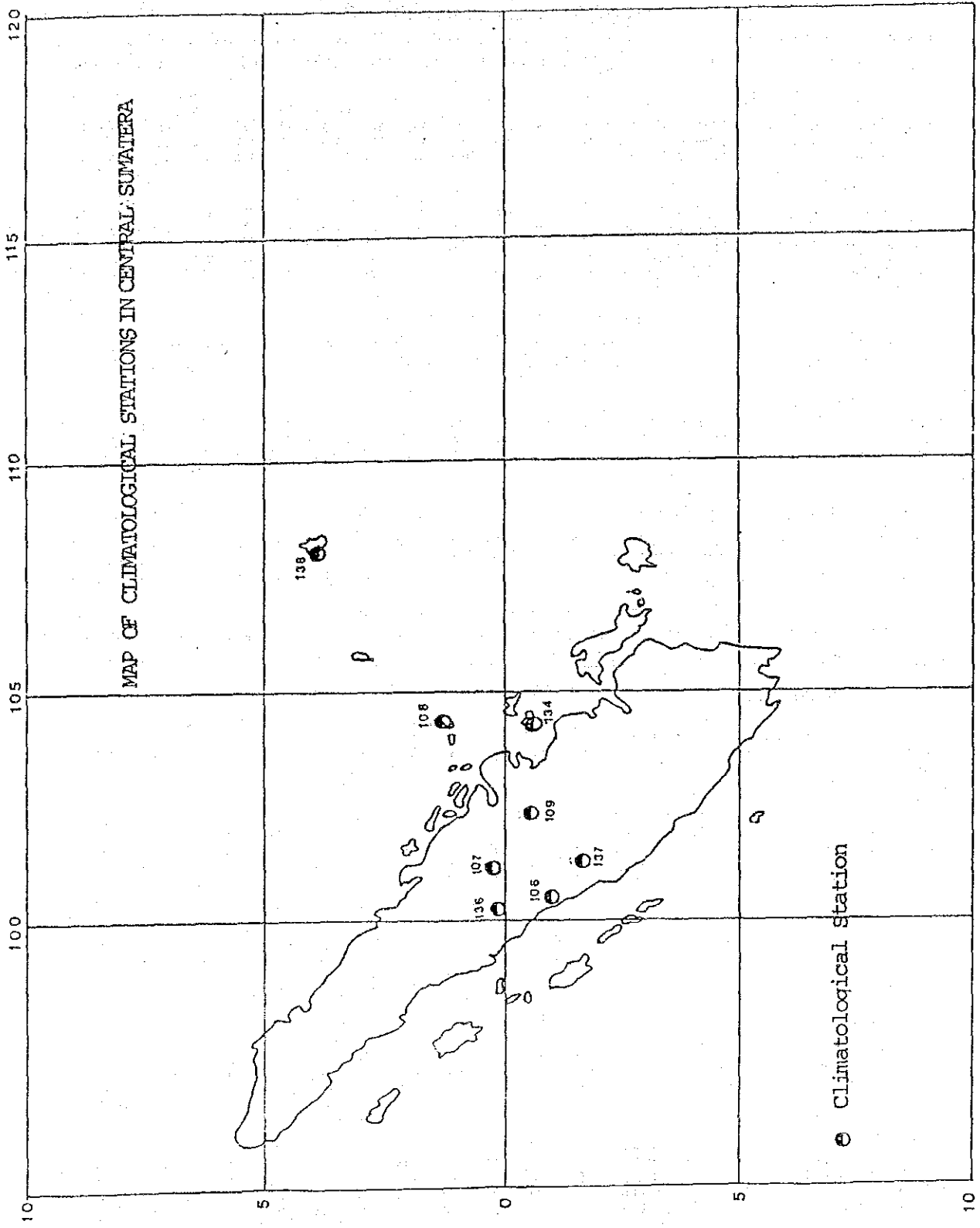
Climatic Condition in Central Sumatera

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial statements. This includes not only sales and purchases but also expenses and income. The document also highlights the need for regular reconciliation of bank statements and the company's records to identify any discrepancies early on.

In addition, the document provides a detailed breakdown of the accounting cycle, from identifying the accounting entity to preparing financial statements. It explains how each step contributes to the overall accuracy and reliability of the financial data. The document also includes a section on the importance of internal controls, which are designed to prevent errors and fraud within the organization.

The second part of the document focuses on the practical application of these principles. It provides a series of examples and exercises that illustrate how to record and classify transactions. These examples cover a wide range of business activities, from simple sales to complex transactions involving multiple parties. The document also includes a section on the preparation of journal entries, which are the foundation of the accounting system.

Finally, the document concludes with a summary of the key points discussed throughout the document. It reiterates the importance of accuracy, regular reconciliation, and the use of internal controls to ensure the reliability of the financial statements. The document also includes a list of references and a glossary of key terms used throughout the document.



MAP OF CLIMATOLOGICAL STATIONS IN CENTRAL SUMATERA

● Climatological Station

TEMPERATUR UDARA RATA-RATA DALAM °C

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	460	249	244	249	255	255	255	252	247	245	251	251	253
137	Sukarambi Keb. Perc.	01°00'LS 101°00'BT	928	204	200	204	211	215	211	207	207	210	208	206	207
106	Tabing	00°50'LS 100°22'BT	03	261	257	265	267	264	265	269	268	260	268	257	261
RIAU:															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	208	258	271	272	208	267	273	271	268	271	262	262
109	Japura-Rengat	00°26'LS 102°27'BT	18	268	252	262	264	266	264	265	268	261	261	260	260
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	256	251	262	266	268	268	263	260	263	262	261	261
138	Ranal	03°58'LU 108°24'BT	02	—	*	*	—	—	—	—	—	273	281	268	247
108	Tg. Pinang	00°55'LU 104°32'BT	14	252	253	257	257	281	280	269	257	268	257	255	255

TEMPERATUR MAXIMUM RATA-RATA DALAM °C

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	460	301	293	297	308	316	318	317	308	305	310	303	298
137	Sukarambi Keb. Perc.	01°00'LS 101°00'BT	928	235	230	234	247	255	255	249	247	246	246	242	238
106	Tabing	00°56'LS 100°22'BT	03	305	307	310	312	309	307	306	301	303	302	301	—
RIAU:															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	315	297	314	312	309	305	306	305	304	311	303	302
109	Japura-Rengat	00°26'LS 102°27'BT	18	—	—	—	319	321	321	315	311	311	316	319	311
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	314	314	323	330	336	335	325	318	330	319	321	321
138	Ranal	03°58'LU 108°24'BT	02	—	*	*	—	—	—	—	318	327	321	307	296
108	Tg. Pinang	00°55'LU 104°32'BT	14	304	299	309	315	317	316	309	311	300	312	301	299

TEMPERATUR MINIMUM RATA-RATA DALAM °C

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	460	218	212	216	224	216	208	208	209	207	219	220	223
137	Sukarambi Keb. Perc.	01°00'LS 101°00'BT	928	182	178	181	186	187	178	178	176	181	183	180	187
106	Tabing	00°56'LS 100°22'BT	03	229	221	229	233	229	223	221	218	227	221	223	227
RIAU:															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	223	229	239	239	234	232	241	239	237	236	229	220
109	Japura-Rengat	00°26'LS 102°27'BT	18	221	210	217	219	216	211	221	214	227	230	230	230
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	215	210	219	223	222	216	213	211	221	219	222	219
138	Ranal	03°58'LU 108°24'BT	02	—	*	*	—	—	—	—	228	236	216	188	203
108	Tg. Pinang	00°55'LU 104°32'BT	14	212	217	215	216	223	223	223	219	222	220	226	223

JUMLAH CURAH HUJAN DALAM MM. (Rainfall)

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	460	69	57	55	78	74	43	121	110	152	256	403	113
137	Sukarambi Keb. Perc.	01°00'LS 101°00'BT	928	256	320	401	256	128	112	79	163	117	283	356	318
106	Tabing	00°56'LS 100°22'BT	03	358	297	105	295	446	192	162	147	257	176	711	431
RIAU:															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	10	208	12	158	227	374	332	155	117	204	273	191
109	Japura-Rengat	00°26'LS 102°27'BT	18	104	262	121	300	214	71	39	120	137	163	373	211
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	182	319	134	118	163	172	81	158	233	176	369	332
138	Ranal	03°58'LU 108°24'BT	02	58	*	*	06	03	323	140	251	70	232	257	329
108	Tg. Pinang	00°55'LU 104°32'BT	14	53	159	61	94	302	202	329	218	263	238	454	404

SINAR MATAHARI DALAM %

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	450	27	25	29	32	43	40	43	33	32	32	27	—
137	Sukarani Keb. Perc.	01°00'LS 101°00'BT	928	30	33	35	48	69	63	49	48	47	32	30	—
106	Tabing	00°56'LS 100°22'BT	03	57	44	60	55	63	61	61	58	42	40	44	62
R I A U :															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	—	—	—	—	—	—	—	—	—	—	—	—
109	Japura-Rengat	00°26'LS 102°27'BT	18	—	—	—	—	50	57	38	24	29	20	21	—
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	42	46	48	55	70	75	65	48	42	54	40	48
138	Ranal	03°56'LU 108°24'BT	02	—	*	*	—	—	—	—	65	60	51	45	42
108	Tg. Pinang	00°56'LU 104°32'BT	14	82	80	81	57	58	54	52	50	44	42	40	46

TEKANAN UDARA RATA-RATA + 1000 DALAM MILIHARSI

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	450	—	—	—	—	—	—	—	—	—	—	—	—
137	Sukarani Keb. Perc.	01°00'LS 101°00'BT	928	—	—	—	—	—	—	—	—	—	—	—	—
106	Tabing	00°56'LS 100°22'BT	03	10.4	10.6	11.2	09.8	10.2	10.1	09.6	10.6	11.5	11.7	11.5	11.1
R I A U :															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	10.1	10.5	11.2	09.3	09.3	09.1	08.5	09.8	10.2	10.8	10.3	10.7
109	Japura-Rengat	00°26'LS 102°27'BT	18	11.2	11.9	12.0	10.2	10.4	10.1	09.6	10.9	11.0	11.8	11.5	11.9
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	10.1	10.8	11.3	09.0	09.1	08.8	08.1	09.7	09.9	10.7	10.1	10.9
138	Ranal	03°56'LU 108°24'BT	02	11.2	*	*	10.2	10.1	09.5	08.8	10.2	10.2	11.4	11.1	11.3
108	Tg. Pinang	00°56'LU 104°32'BT	14	11.2	11.9	12.4	10.2	10.1	09.9	09.4	10.6	10.9	11.5	11.4	11.6

KECEPATAN ANGIN RATA-RATA DALAM % (Humidity)

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	450	84	82	83	86	82	79	77	82	82	81	83	82
137	Sukarani Keb. Perc.	01°00'LS 101°00'BT	928	92	91	92	91	87	81	86	88	88	91	91	91
106	Tabing	00°56'LS 100°22'BT	03	83	80	82	84	83	80	81	81	82	86	85	85
R I A U :															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	76	82	76	82	84	83	79	78	82	82	86	86
109	Japura-Rengat	00°26'LS 102°27'BT	18	84	85	86	87	84	81	82	82	81	84	85	86
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	85	86	83	85	84	82	83	81	81	85	86	86
138	Ranal	03°56'LU 108°24'BT	02	—	*	*	—	—	—	—	—	—	—	—	—
108	Tg. Pinang	00°56'LU 104°32'BT	14	79	83	70	82	86	85	85	83	86	86	88	87

KECEPATAN ANGIN RATA-RATA DALAM KNOTS (Average wind velocity)

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	FEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA BARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	450	—	—	—	—	—	—	—	—	—	—	—	—
137	Sukarani Keb. Perc.	01°00'LS 101°00'BT	928	—	—	—	—	—	—	—	—	—	—	—	—
106	Tabing	00°56'LS 100°22'BT	03	04	05	04	04	04	04	04	04	01	01	01	01
R I A U :															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	09	08	11	08	05	06	07	07	06	05	04	07
109	Japura-Rengat	00°26'LS 102°27'BT	18	04	04	03	02	02	02	03	03	02	02	02	02
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	06	06	06	05	06	08	07	06	05	05	06	06
138	Ranal	03°56'LU 108°24'BT	02	07	*	*	05	05	05	05	06	09	06	09	14
108	Tg. Pinang	00°56'LU 104°32'BT	14	08	08	09	08	07	07	08	09	08	07	06	07

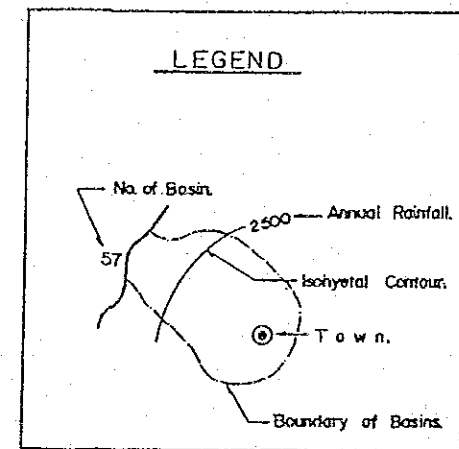
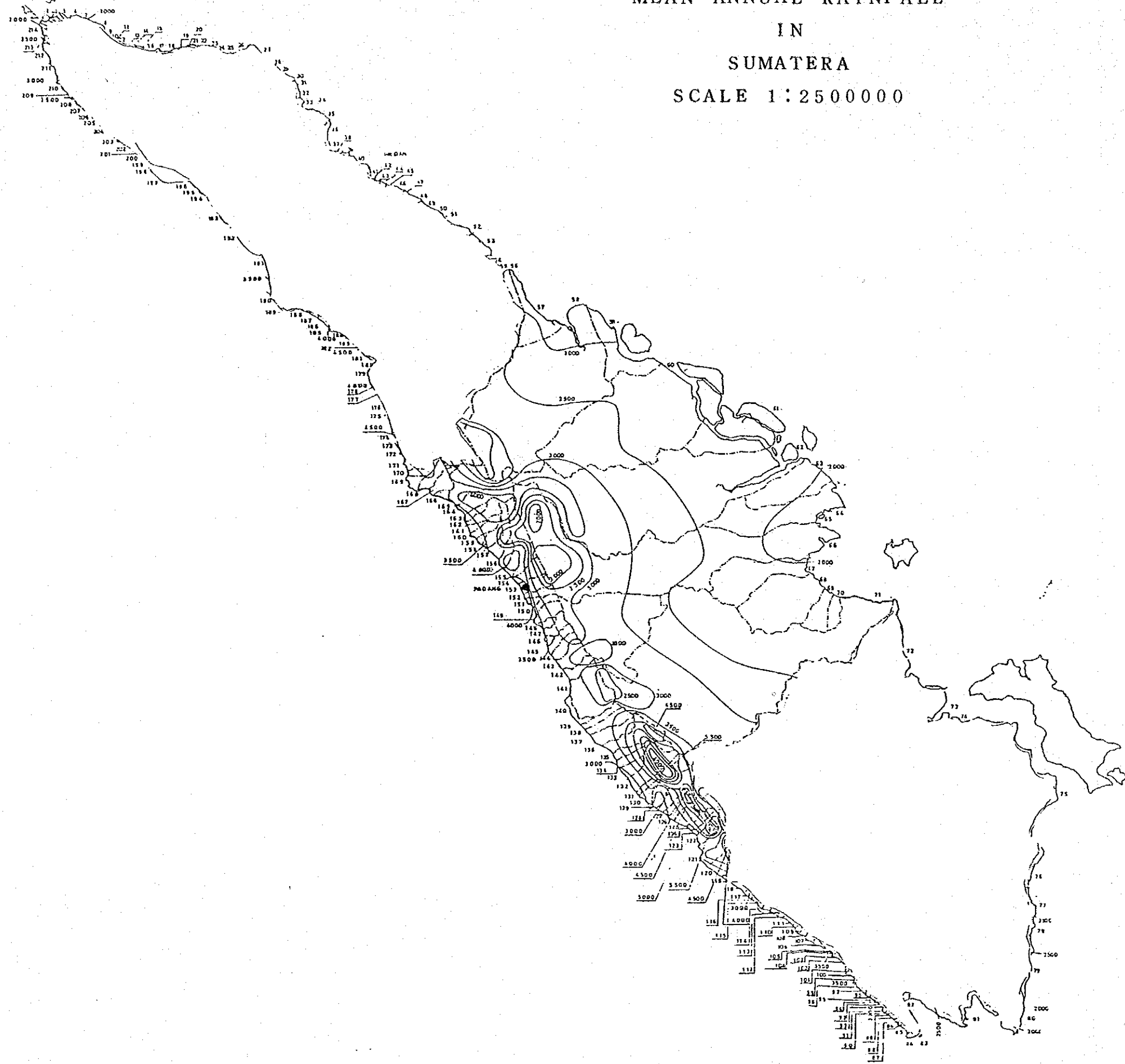
KECERPATAN ANGIN TERBESAR DALAM KNOTS (Max. wind velocity)

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	PEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA DARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	450	--	--	--	--	--	--	--	--	--	--	--	--
137	Sukarani Keb. Perc.	01°00'LS 101°00'BT	928	06	08	08	08	09	11	11	08	08	01	08	08
106	Tabing	00°56'LS 100°22'BT	03	20	35	27	26	21	25	30	30	25	25	29	20
RIAU:															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	17	15	20	13	12	15	14	13	16	16	16	17
109	Japura-Rengat	00°26'LS 102°27'BT	18	15	12	15	10	13	15	15	15	14	16	12	15
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	20	18	13	15	25	20	18	20	18	15	11	15
138	Ranal	03°56'LU 108°24'BT	02	14	*	*	15	18	30	15	20	30	30	20	25
108	Tg. Pinang	00°55'LU 104°32'BT	14	18	20	25	16	18	18	17	20	15	15	17	16

ARAH ANGIN TERBANYAK

NO. URUT	NAMA STASIUN	LOKASI	TINGGI METER	JAN	PEB	MAR	APR	MEI	JUN	JUL	AGS	SEP	OKT	NOV	DES
SUMATERA DARAT:															
136	Padang Gelugur-Pasaman	00°22'LU 100°03'BT	450	--	--	--	--	--	--	--	--	--	--	--	--
137	Sukarani Keb. Perc.	01°00'LS 101°00'BT	928	NE	NE	NE	NE	SW	SW	SW	SW	SW	NE	SW	NE
106	Tabing	00°56'LS 100°22'BT	03	W	W	SW	SW	W	W	W	W	W	W	W	W
RIAU:															
134	Dabo-Singkep	00°29'LS 104°35'BT	18	N	N	NE	NE	S	S	S	SE	S	SE	S	N
109	Japura-Rengat	00°26'LS 102°27'BT	18	N	N	N	E	S	S	S	S	S	S	N	N
107	Pekanbaru-Simpang Tiga	00°28'LU 101°26'BT	31	N	N	N	S	S	S	S	S	S	S	N	N
138	Ranal	03°56'LU 108°24'BT	02	N	*	*	NE	S	S	S	S	S	NE	S	N
108	Tg. Pinang	00°55'LU 104°32'BT	14	N	N	NE	NE	SW	S	S	S	S	S	N	N

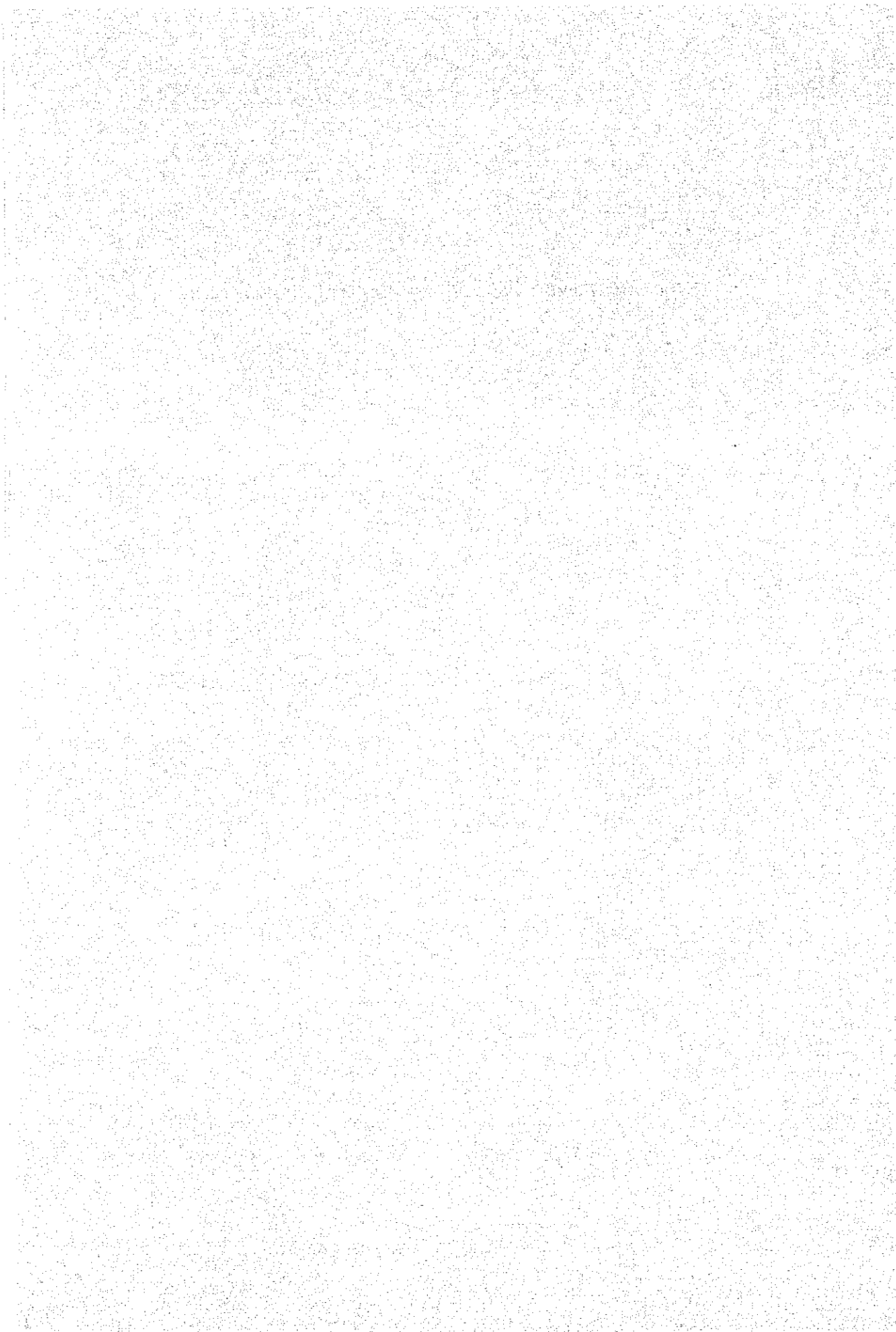
MEAN ANNUAL RAINFALL
IN
SUMATERA
SCALE 1:2500000



REPUBLIC OF INDONESIA
PERUSAHAAN UMUM LISTRIK NEGARA

HYDROPOWER POTENTIALS STUDY

Electric Power Demand in Central Sumatera



7 - 1 Power Demand Forecast and Proposed Power Plant Plan
in West Sumatra Province (1/2)

<u>Item/Year</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Power Demand (GWh)	70.9	130	200	270	387.3	460	570	680	800	871.1
Generated Energy (GWh)	95.9	175	270	362	516.4	605	740	872	1,012	1,088.9
Peak Load (MW)	24.0	37.5	50.0	67.5	85.0	102.0	122.5	147.5	172.5	200.0
Abolishable Capacity (MVA)	-	5.5	-	-	0.2	1.1	0.4	-	1.3	4.2
(MW)	-	(2.3)	-	-	(0.2)	(1.0)	(0.3)	-	(0.9)	(3.6)
Additional Capacity (MVA)	D ₀	D ₁	DG	H ₁			S ₁		S ₂	
(MW)	4.9	12.6	17.9	68.0	-	-	100.0	-	50.0	50.0
	(4.7)	(10.0)	(15.2)	(68.0)	-	-	(100.0)	-	(50.0)	(50.0)
Available Capacity (MW)	34.5	42.2	57.4	125.4	125.2	124.2	223.9	223.9	273.0	319.4
Operating Capacity (MW)	24.0	37.5	50.0	67.5	85.0	102.0	122.5	147.5	172.5	200.0
Reserved Capacity (MW)	10.5	4.7	7.4	11.0	8.7	22.2	56.0	31.0	12.5	78.5
Cold Capacity (MW)	-	-	-	46.9	31.5	-	45.4	45.4	44.5	40.7
Installed Capacity (MW)	40.9	48	65.9	133.9	133.7	132.6	232.2	232.2	280.9	326.7

7-1 Power Demand Forecast and Proposed Power Plant Plan
in Sumatra Province (2/2)

<u>Item/Year</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
Power Demand (GWh)	1,080	1,240	1,400	1,560	1,696.7	1,840	1,980	2,100	2,210	2,319.4
Generated Energy (GWh)	1,341	1,531	1,728	1,914	2,069.1	2,230	2,385	2,530	2,646	2,761.2
Peak Load (MW)	230.0	265.0	302.5	342.5	382.5	420.0	452.5	482.5	507.5	530.0
Abolishable Capacity (MVA)	7.4	8.2	-	1.4	0.7	12.6	17.9	-	-	-
(MW)	(6.6)	(7.3)	-	(1.2)	(0.6)	(10.0)	(15.2)	-	-	-
Additional Capacity (MVA)	-	-	D2	H2	-	H3	-	D3	D4	D5
(MW)	-	-	19.6	90.0	-	90.0	-	32.7	29.4	26.5
	-	-	(16.7)	(90.0)	-	(90.0)	-	(27.8)	(25.0)	(22.5)
Available Capacity (MW)	321.8	305.5	322.2	411.0	410.4	499.4	475.2	503.0	528.0	550.0
Operating Capacity (MW)	230.0	265.0	302.5	342.5	382.5	420.0	452.5	482.5	507.5	530.0
Reserved Capacity (MW)	48.5	28.7	19.7	42.7	27.9	38.5	22.7	20.5	20.5	20.5
Cold Capacity (MW)	34.3	11.8	-	25.8	-	31.9	-	-	-	-
Installed Capacity (MW)	319.3	311.1	330.7	419.3	418.6	496.0	478.1	510.8	540.2	566.7

7-2 Number of Residential Customers Forecast (West Sumatra)

Year	1981	1985	1990	1995	2000	Annual Growth Rate
Urban Area	48,514	95,000	144,800	202,000	287,000	9.9%
Rural Area	10,905	46,100	86,400	145,200	219,000	17.1%
Total	59,419	141,100	231,200	350,700	511,000	12.0%

7-3 Annual Power Consumption Forecast (West Sumatra)

Year	1981 (kWh)	1985 (kWh)	1990 (kWh)	1995 (kWh)	2000 (kWh)	Annual Growth Rate
Urban Area	850	1,050	1,200	1,500	1,800	4.0%
Rural Area	450	600	750	800	850	3.4%

7-4 Past Data of Commercial Customers'
Power Consumption (West Sumatra)

Year	No. of Commercial Customers		Power Consumption		Yearly Power Consumption per Commercial Customer	
	(1)		(2)		(2)/(1)	
	Urban Area	Rural Area	Urban Area (MWh)	Rural Area (MWh)	Urban Area (kWh)	Rural Area (kWh)
1973	1,065	50	2,471	39	2,320	780
1977	1,621	228	3,336	129	2,060	565
1981	2,979	514	10,800	300	4,000	1,000
Annual Growth Rate	13.7%	33.8%	20.2%	29.0%	7.0%	3.0%

7-5 Number of Commercial Customers Forecast (West Sumatra)

Year	1981	1985	1990	1995	2000	Annual Growth Rate
Urban Area	2,979	4,750	7,240	10,100	14,300	8.6%
Rural Area	514	1,840	3,450	5,800	8,700	16.0%
Total	3,493	6,590	10,690	15,900	23,000	10.4%

Past Data of Public Customers'
Power Consumption (West Sumatra)

Year	No. of Commercial Customers (1)		Power Consumption (2)		Yearly Power Consumption per Commercial Customer (2)/(1)	
	Urban Area	Rural Area	Urban Area (MWh)	Rural Area (MWh)	Urban Area (kWh)	Rural Area (kWh)
1973	921	172	6,926	430	7,520	2,500
1977	1,134	282	7,762	579	6,840	2,050
1981	2,027	318	14,200	1,100	8,000	3,900
Annual Growth Rate	10.4%	8.0%	9.9%	14.3%	0.8%	5.8%

7-7 Number of Public Customers Forecast (West Sumatra)

Year	No. of Residential Customers and Commercial Customers		No. of Public Customers	
	Urban Area	Rural Area	Urban Area	Rural Area
1981	51,493	11,419	2,027	318
1985	99,750	47,940	3,990	1,430
1990	152,040	89,850	6,080	1,790
1995	212,100	151,000	8,480	3,020
2000	301,300	227,700	12,050	4,550
Annual Growth Rate	9.7%	17.0%	9.8%	15.0%

7-8

Yearly Power Consumption per One Industrial
Customer A (West Sumatra)

Year	No. of Industrial Customers	Power Consumption (MWh)	Yearly Power Consump- tion per Industrial Customer (kWh)
1973	186	1,585	8,520
1977	201	3,951	19,660
1981	229	5,830	25,460
Annual Growth Rate	2.6%	17.7%	14.6%

Source; PLN Wilayah III (Padang)

7-9 List of Industrial Customer B (West Sumatra)

Name of Company	Kind of Business	Capacity of Generated Facility (kVA)
P.T Semen Padang	cement	13,492
RPI Padang	communication	109
P.T P&P Zanzibar	rubber	989
P.T Famili Raya	"	700
P.T Trakindo Utama	workshop	275
P.T Asia Biscuit Factory	biscuit	270
P.T Albari	coconut	285
P.T Hadis Didong	"	1,320
P.D Sari Petojo	ice	48
P.T P&P Lembah Karya	coconut & soap	740
P.T Gunung Pulo Sari	tire	138
P.T Pabrik Es Bening	ice	123
Stasiun Lintas SKSD	communication	300
P.T Industry Kayu Bujang	wood	110
Sub-total (1)	(14 customers)	18,899 kVA (58 GWh)
P.T Tambang Batubara Ombilin	coal	15,825
P.T Lembaga Tanaman Industry	seeding cultivation	49
P.T Gilingan Kopi	coffee	33
Sub-total (2)	(3 customers)	15,907 kVA (90.6 GWh)

(to be continued)

Name of Company	Kind of Business	Capacity of Generated Facility (kVA)
P.T Dan Zipur 2 Dam III	school	30
P.T Station Relay TV RI	T.V.	143
P.T D. DT. Perpatih	workshop	18
P.T Indah Theater	cinema	19
P.T Koperasi Pandai Besi	workshop	18
Sub-total (3)	(5 customers)	228 kVA (0.7 GWh)
Total (1)+(2)+(3)	(22 customers)	35,034 kVA

Source: PLN Wilayah III (Padang)

7-10 Power Demand Forecast by Industrial Customer C (West Sumatra)

Year	P.T. Indarung Cement		P.T. Emdeki Utama		Small Industrial Estate		Sub-total (GWh)
	Production (x 10 ³ ton)	Power Demand (MWh)	Production	Power Demand (MWh)	Production	Power Demand (MWh)	
1981	930	-	-	-	-	-	0
1985	1,890	127,500	*	54.7	*	4.9	187.1
1990	8,130	387,500	*	54.7	*	4.9	447.1
1995	12,930	848,600	*	54.7	*	4.9	908.2
2000	15,330	1,015,400	*	54.7	*	4.9	107.5

Note: * Data is not available.

7-11 Power Demand Forecast and Proposed Power Plant Plan
in Wilayah III (1/2)

<u>Item/Year</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Power Demand (GWh)	116.7	194	290	397	565.6	660	796	934	1,086	1,195.3
Generated Energy (GWh)	154.6	257	384	522	739.2	851	1,019	1,183	1,361	1,486.5
Peak Load (MW)	36.3	46.0	59.0	78.0	107.6	127.0	165.0	194.0	230.0	267.0
Abolishable Capacity (MVA)	-	9.6	0.2	-	0.5	1.1	0.4	0.8	7.6	11.2
(MW)	-	(5.5)	(0.1)	-	(0.4)	(1.0)	(0.3)	(0.4)	(6.2)	(8.8)
Additional Capacity (MVA)	7.8	16.1	32	77.5	16.5	7.5	112.5	8.0	67.1	79.0
(MW)	(7.2)	(13.0)	(27.2)	(76.0)	(13.2)	(6.0)	(110.0)	(6.4)	(65.3)	(73.2)
Available Capacity (MW)	51.8	57.3	86.4	162.4	175.2	180.2	289.9	295.9	355.0	419.4
Operating Capacity (MW)	36.3	55.5	74.0	101.5	132.0	153.0	183.5	214.5	246.5	292.0
Reserved Capacity (MW)	15.5	3.8	12.4	14.0	11.7	27.2	61.0	36.0	64.0	86.5
Cold Capacity (MW)	-	-	-	46.9	31.5	-	45.4	45.4	44.5	10.9
Installed Capacity (MW)	59.6	66.1	97.9	175.4	191.4	197.8	309.9	317.1	378.6	446.4

6

Power Demand Forecast and Proposed Power Plant Plan
in Wilayah III (2/2)

<u>Item/Year</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
Power Demand (GWh)	1,685	1,907	2,142	2,375	2,592.6	2,830	3,060	3,250	3,415	3,579.6
Generated Energy (GWh)	2,074	2,334	2,616	2,890	3,135.6	3,408	3,671	3,891	4,072	4,243.8
Peak Load (MW)	362.0	403.0	453.0	493.0	538.1	598.0	647.0	700.0	750.0	786.0
Abolishable Capacity (MVA)	7.4	8.2	-	4.3	4.2	26.7	27.4	16.5	7.5	12.5
(MW)	(6.6)	(7.3)	-	(3.7)	(3.6)	(22.0)	(23.2)	(13.2)	(6.0)	(10.0)
Additional Capacity (MVA)	111.0	-	19.6	90.0	90.0	90.0	-	122.7	29.4	26.5
(MW)	(111.0)	-	(16.7)	(90.0)	(90.0)	(90.0)	-	(117.8)	(25.0)	(22.5)
Available Capacity (MW)	523.8	516.5	533.2	619.5	705.9	773.9	750.7	855.3	874.3	886.8
Operating Capacity (MW)	368.0	417.0	469.5	524.5	591.2	645.0	696.5	742.5	782.5	817.7
&										
Reserved Capacity (MW)	60.0	42.6	37.8	53.8	43.4	53.0	34.6	51.5	59.7	62.3
Gold Capacity (MW)	95.8	56.9	25.9	41.2	71.3	75.9	19.6	61.3	32.1	6.8
Installed Capacity (MW)	550.0	514.8	561.4	647.1	732.9	796.2	768.8	875.0	896.9	910.9

Power Demand Forecast and Proposed Power Plant Plan
in Riau Province (excluding Kepulauan Riau) (1/2)

<u>Item/Year</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Power Demand (GWh)	45.8	64	90	127	178.3	200	226	254	286	324.2
Generated Energy (GWh)	58.7	82	114	160	222.8	249	279	311	349	397.6
Peak Load (MW)	12.3	18	24	34	47	51	61	67	74	92
Abolishable Capacity (MVA)	-	4.1	0.2	-	0.3	-	-	0.8	6.3	7.0
(MW)	-	(3.2)	(0.1)	-	(0.2)	-	-	(0.4)	(5.3)	(5.2)
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀
Additional Capacity (MVA)	2.9	3.5	14.1	9.5	16.5	7.5	12.5	8.0	19.1	29.0
(MW)	(2.5)	(3.0)	(12.0)	(8.0)	(13.2)	(6.0)	(10.0)	(6.4)	(15.3)	(23.2)
Available Capacity (MW)	17.3	17.1	29.0	37.0	50.0	56.0	66.0	72.0	82.0	100.0
Operating Capacity (MW)	12.3	18.0	24.0	34.0	47.0	51.0	61.0	67.0	74.0	92.0
Reserved Capacity (MW)	5.0	-0.9	5.0	3.0	3.0	5.0	5.0	5.0	8.0	8.0
Cold Capacity (MW)	-	-	-	-	-	-	-	-	-	-
Installed Capacity (MW)	18.7	18.1	32	41.5	57.7	65.2	77.7	84.9	97.7	119.7

7-12 Power Demand Forecast and Proposed Power Plant Plan
in Riau Province (excluding Kepulauan Riau) (2/2)

Item/Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Power Demand (GWh)	605	667	742	815	895.9	990	1,080	1,150	1,205	1,260.2
Generated Energy (GWh)	733	803	888	976	1,066.5	1,178	1,286	1,361	1,426	1,482.6
Peak Load (MW)	138	152	167	182	208.7	225	244	260	275	287.7
Abolishable Capacity (MVA)	-	-	-	D1 2.9	D2 3.5	D3 14.1	D4 9.5	D5 16.5	D6 7.5	D7 12.5
(MW)	-	-	-	(2.5)	(3.0)	(12.0)	(8.0)	(13.2)	(6.0)	(10.0)
Additional Capacity (MVA)	H1 111	-	-	-	H2 90	-	-	H3 90	-	-
(MW)	(111)	-	-	-	(90)	-	-	(90)	-	-
Available Capacity (MW)	211.0	211.0	211.0	208.5	295.5	283.5	275.5	352.3	346.3	336.3
Operating Capacity (MW)	138.0	152.0	167.0	182.0	208.7	225	244	260	275	287.7
Reserved Capacity (MW)	11.5	13.9	18.1	11.1	15.5	14.5	11.9	31	39.2	41.8
Cold Capacity (MW)	61.5	45.1	25.9	15.4	71.3	-1.0	19.6	61.3	32.1	6.8
Installed Capacity (MW)	230.7	230.7	230.7	227.8	314.3	300.2	290.7	364.2	356.7	344.2

7-13 Number of Residential Customers Forecast (Riau)

Year	1981	1985	1990	1995	2000	Annual Growth Rate
Urban Area	16,447	29,800	39,900	49,400	60,700	7.1%
Rural Area	7,686	32,100	74,000	144,900	226,400	19.5%
Total	24,133	61,900	113,900	194,300	287,200	13.9%

7-14 Annual Power Consumption Forecast per Customer (Riau)

Year	1981 (kWh)	1985 (kWh)	1990 (kWh)	1995 (kWh)	2000 (kWh)	Annual Growth Rate
Urban Area	1,220	1,300	1,500	1,750	2,000	2.6%
Rural Area	750	750	850	950	1,050	1.8%

7-15 Past Data of Commercial Customers'
Power Consumption (Riau)

Year	No. of Commercial Customers		Power Consumption		Yearly Power Consumption per Commercial Customer	
	(1)	(1)	(2)	(2)	(2)/(1)	(2)/(1)
	Urban Area	Rural Area	Urban Area (MWh)	Rural Area (MWh)	Urban Area (kWh)	Rural Area (kWh)
1973	1,164	783	1,688	496	1,450	634
1974	1,250	792	2,449	540	1,960	682
1975	1,341	814	2,133	594	1,591	730
1976	1,382	826	2,178	724	1,576	876
1977	1,457	861	2,306	817	1,583	949
1978	1,671	905	2,736	823	1,638	908
1979	2,009	977	3,500	964	1,742	987
1980	2,124	1,241	4,772	1,550	2,250	1,250
1981	2,351	1,495	6,093	1,631	2,590	1,090
Annual Growth Rate	9.2%	8.4%	19.6%	16.0%	7.5%	7.0%

7-16 Number of Commercial Customers Forecast (Riau)

Year	1981	1985	1990	1995	2000	Annual Growth Rate
Urban Area	2,351	4,170	5,580	6,900	8,500	7.5%
Rural Area	1,495	2,530	5,920	11,600	18,100	7.1%
Total	3,846	6,700	11,500	18,500	26,600	10.7%

7-17 Past Data of Public Customers'
Power Consumption (Riau)

Year	No. of Commercial Customers		Power Consumption		Yearly Power Consumption per Commercial Customer	
	(1)	(2)	(2)	(1)	(2)/(1)	(2)/(1)
	Urban Area	Rural Area	Urban Area (MWh)	Rural Area (MWh)	Urban Area (kWh)	Rural Area (kWh)
1973	239	192	1,303	453	5,450	2,360
1974	249	180	1,507	513	6,050	2,850
1975	276	155	1,795	422	6,500	2,730
1976	304	164	1,930	605	6,350	3,680
1977	328	181	2,193	540	6,685	2,990
1978	378	229	2,376	886	6,290	3,870
1979	453	290	2,736	1,117	6,040	3,850
1980	504	348	5,119	787	10,160	2,260
1981	579	447	5,756	1,336	9,940	2,990
Annual Growth Rate	11.7%	11.1%	20.4%	14.5%	7.8%	3.0%

7-18 Number of Public Customers Forecast (Riau)

Year	No. of Residential Customers and Commercial Customers		No. of Public Customers	
	Urban Area	Rural Area	Urban Area	Rural Area
1981	18,798	9,181	579	447
1985	33,972	34,630	1,020	1,040
1990	45,486	79,920	1,360	2,000
1995	56,316	156,500	1,690	2,050
2000	69,198	244,600	2,075	2,450
Annual Growth Rate	7.1%	18.9%	7.0%	9.4%

7-19 Past Data of Industrial Customers' A
Power Consumption (Riau)

Year	Nos. of Industrial Customers	Power Consumption (MWh)	Yearly Power Consumption per Industrial Customer (kWh)
1973	14	240	17,100
1974	16	499	31,200
1975	18	529	29,400
1976	22	1,318	59,900
1977	26	2,280	95,000
1978	26	2,657	102,100
1979	26	2,497	96,000
1980	12	5,411	450,900
1981	15	5,433	362,200
Annual Growth Rate	10.9%	47.8%	33.3%

Source: PLN Wilayah III (Padang and Pekanbaru)

Name of Company	Kind of Business	Capacity of Generated Facility (kVA)	District
P.T Bangkinang	rubber remilling	500	Pekanbaru
P.T. Seno press	printing	100	"
P.T Asia	plastics	100	"
P.T Ramah Tamah	sawmill	52	"
P.T Siak & Co.	ice	115	"
P.T Tampan	ice	50	"
P.T Asia & Co.	aluminium	100	"
P.T Nastiti	rubber	830	"
P.T SKSD Telkom	communication	300	"
C.V Union Siak	rubber	855	"
P.T ACI	sawmill	500	"
P.T Erba Rubber	rubber	539	"
R.R.I (Radio station, Republic of Indonesia)	communication	142	"
P.T Cake citarasa	cake	25	"
P.T Karya Nyata	workshop	25	"
Sub-total (1)	(15 customers)	4,233 (13.3 GWh)	
P.T Pabrik es being	ice storage	75	Dumai
P.T Bengkel	workshop	80	"
P.T Station radio pemancar	communication	70	"
P.T Pemancar	radio	60	"
P.T Pabric es suntara	ice	25 22 (1 GWh)	"
Pertamina	oil refinery	78,750 (165 GWh)	"
Sub-total (2)	(6 customers)	79,060 (166 GWh)	

(to be continued)

Name of Company	Kind of Business	Capacity of Generated Facility (kVA)	District
P.T Proyek Tambang		106	Kampar
P.T Bangkinang		435	"
P.T Bioskop ADB	cinema	12.5	"
Sub-total (3)	(3 customers)	553.5 (1.7 GWh)	
P.T Union Siak	rubber remilling	620	Rengat
P.T Tirta Sari Surya	"	681	"
P.T Wiratto	workshop	10	"
P.T Sanjaya	"	6	"
Kantor Bupati	public office	8	"
Kantor Telegraph/Radio	communication	11	"
P.T Septene Riau	cinema	14	"
P.T Bank Exim	bank	17	"
Sub-total (4)	(8 customers)	1,367 (4.3 GWh)	
C.V Gena	oil	112.5	Tembilahan
P.T Kembang Jaya	coconut oil	10	"
P.T Karya Utama	workshop	5	"
P.T Sari Wangi	ice	16	"
P.T Harumna Manis	"	22	"
Kantor telegraph	telecommunication	10	"
Sub-total (5)	(6 customers)	177.5 (0.6 GWh)	
P.T Pulau Sambu	coconut oil	350	Kuala Enok
P.T Husin Arifin	"	410	"
P.T Majid/Asang	ice	17.5	"
P.T M. Syafri	"	11.5	"
Sub-total (6)	(4 customers)	789.0 (2.5 GWh)	

(to be continued)

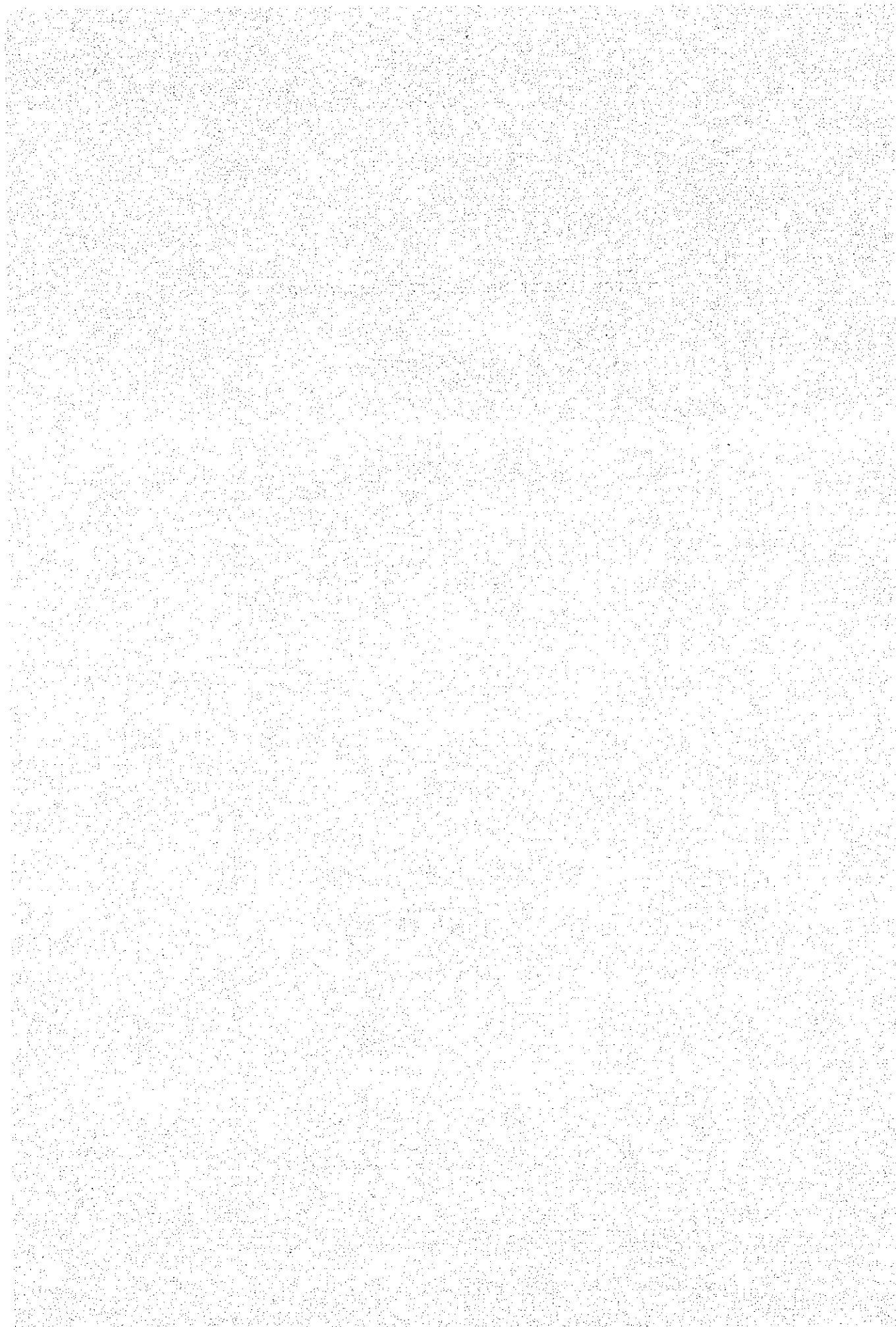
name of Company	Kind of Business	Capacity of Generated Facility (kVA)	District
P.T Bengkel Armada Navigasi	workshop	60	Bengkalis
P.T Bengkel Reparasi	"	31	"
P.T Sinar Wijaya Maju	rubber	362	"
P.T Bengkel Jaya	workshop	30	"
Sub-total (7)	(4 customers)	483.0 (1.5 GWh)	"
P.T Bengkel Turino/ KHO Peng Hoo	workshop	33	Bagan Siapi-api
P.T Bengkel Samsir	"	30	"
P.T Tan Cui Bak	ice	20	"
P.T Kadir	"	11.5	"
Sub-total (8)	(4 customers)	61.5 (0.2 GWh)	"
Total (1)+(2)+(3)+(4)+(5)+(6)+(7)+(8)	(50 customers)	86,724.5 kVA	

Source: PLN Wilayah III (Padang and Pekanbaru)

7-21 List of Industrial Customer C (Riau)

Name of Company	Kind of Business	Planned Production Capacity /Contracted Capacity with PLN	District
P.T Wana Riau Santose	wood	25 x 10 ³ m ³ /year	Pekanbaru
P.T Sela Gratia Plywood Industry	"	30 x 10 ³ m ³ /year	"
P.T Diamond Raya Timber	"	10.8 x 10 ³ m ³ /year	Dumai
P.T Siak Ice Factory	ice	*	Pekanbaru
P.T Nastiti Pekanbaru	crumb rubber	2,000 kVA	"
P.T Plywood Rumbai	plywood	3,000 kVA	"
P.T Kelapa Sawit	palm oil	1,250 kVA	Dumai
C.V Berkat	plywood	1,560 kVA	"
P.T Pusri	fertilizer	1,560 kVA	"
P.T Pacific Venner Product	plywood-mill	70 x 10 ³ m ³ /year	Pekanbaru
P.T The Best One Unit Timber	"	90 x 10 ³ m ³ /year	"

Power Plant in Central Sumatera



DIESEL POWER PLANT PROJECTS : 84/85 - 93/94
 REGION : 3

		SOURCE OF FIN.											
		84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94		
128	SUNGAI PENUH	A.P.											
		A.P.		.50									
		*****		.50									
		*****				1.00							
		*****				1.00							
		*****						2.50					
		*****								2.50			
129	SIJUNJUNG	A.P.		.50									
		A.P.		.25									
		A.P.		.25									
132	PAINAN	A.P.		.50		.25							
		A.P.		.50		.50							
		*****						1.00					

133	SURANTI1	A.P.		.25									
		A.P.		.25									
		*****						.25					

134	SURANTI2	A.P.				.25							

136	SULIT AIR2	A.P.		.25					.25				

		A.P.		.25		.25							
		A.P.		.25		.25							
137	TAPAN	A.P.		.25									
		A.P.		.25									

139	KOTA ANAU	A.P.				.25							

140	LUBUK SIKAPING	A.P.		.25					.25				
		A.P.		.25									
141	PANTI	A.P.		.25									
		A.P.		.25									

FEB '85

DIESEL POWER PLANT PROJECTS : 84/85 - 93/94
 REGION : 3

NLOK	L O C A T I O N	SOURCE of FIN.	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
142	TALU	A.P.	-	-	.25	-	-	-	-	-	-	-
143	PEKAN BARU	A.P.	-	-	.25	-	-	-	-	-	-	-
		FRANCE	-	-	6.00	-	-	-	-	-	-	-
		FRANCE	-	-	6.00	-	-	-	-	-	-	-
		FRANCE	-	-	6.00	-	-	-	-	-	-	-
144	DUMAI	FRANCE	-	-	-	6.00	-	-	-	-	-	-
		FRANCE	-	-	-	6.00	-	-	-	-	-	-
		KFW II	-	-	-	2.50	-	-	-	-	-	-
		KFW II	-	-	-	2.50	-	-	-	-	-	-
		KFW II	-	-	-	2.50	-	-	-	-	-	-
		KFW II	-	-	-	2.50	-	-	-	-	-	-
		*****	-	-	-	-	-	-	-	-	-	5.00
		*****	-	-	-	-	-	-	-	5.00	-	-
		U.K.	-	-	-	5.00	-	-	-	-	-	-
		U.K.	-	-	-	5.00	-	-	-	-	-	-
145	RENGAT	A.P.	-	-	.50	-	-	-	-	-	-	-
		A.P.	-	-	-	-	.50	-	-	-	-	-
		*****	-	-	-	-	-	-	1.00	-	-	-
		*****	-	-	-	-	-	-	1.00	-	-	-
		*****	-	-	-	-	-	-	-	-	-	1.00
146	SELAT PANJANG	A.P.	-	-	.50	-	-	-	-	-	-	-
		A.P.	-	-	.50	-	-	-	-	-	-	-
		*****	-	-	-	-	-	1.00	-	-	-	-
		*****	-	-	-	-	-	1.00	-	-	-	-
147	TELUK KUANTAN	A.P.	-	-	.25	-	-	-	-	-	-	-
		A.P.	-	-	.25	-	-	-	-	-	-	-
		A.P.	-	-	-	-	.25	-	-	-	-	.50
		*****	-	-	-	-	-	-	.50	-	-	-
		*****	-	-	-	-	-	-	-	-	-	.50
148	TEMBILAHAN	A.P.	-	-	.50	-	-	-	-	-	-	-
		A.P.	-	-	.50	-	-	-	-	-	-	-
		*****	-	-	-	-	.50	-	-	-	-	-
		*****	-	-	-	-	-	-	1.00	-	-	-
		*****	-	-	-	-	-	-	1.00	-	-	-
		*****	-	-	-	-	-	-	-	-	-	2.50

DIESEL POWER PLANT PROJECTS : 84/85 - 93/94
 REGION : 3

NLOK	LOCATI ON	SOURCE of FIN.	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
149	BANGKINANG	A.P.	-	-	.50	-	-	-	-	-	-	-
		A.P.	-	-	.50	-	-	-	-	-	-	-
150	BAGAN SIAPI API	A.P.	-	-	.50	-	-	-	-	-	-	-
		A.P.	-	-	.50	-	-	-	-	-	-	-
		*****	-	-	-	-	1.00	-	-	-	-	-
		*****	-	-	-	-	1.00	-	-	-	-	-
151	BENGKALIS	*****	-	-	-	-	-	-	-	-	-	2.50
		A.P.	-	-	.50	-	-	-	-	-	-	-
		*****	-	-	-	-	1.00	-	-	-	-	-
		*****	-	-	-	-	1.00	-	-	-	-	-
		*****	-	-	-	-	-	-	-	2.50	-	-
152	TANJUNG PINANG	KFW I	-	-	2.50	-	-	-	-	-	-	-
		KFW I	-	-	2.50	-	-	-	-	-	-	-
		KFW I	-	-	2.50	-	-	-	-	-	-	-
		KFW I	-	-	2.50	-	-	-	-	-	-	-
		*****	-	-	-	-	-	-	-	5.00	-	-
		*****	-	-	-	-	-	-	-	5.00	-	-
153	AIR MOLEK	A.P.	-	-	.25	-	-	-	-	-	-	-
		A.P.	-	-	.25	-	-	-	-	-	-	-
		*****	-	-	-	-	-	-	-	-	.25	-
TOTAL			-	-	38.75	32.00	9.50	2.00	8.25	18.00	3.00	11.75

FEB '85

POWER PLANT PROJECTS : 84/85 - 93/94
 REGION : 3

NLOK	L O C A T I O N	TYPE	SOURCE of FIN.	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
681	PLTA SINGKARAK	HYDRO	*****	-	-	-	-	-	-	-	50.00	-	-
		HYDRO	*****	-	-	-	-	-	-	-	50.00	-	-
		HYDRO	*****	-	-	-	-	-	-	-	-	50.00	-
683	KOTOPANJANG	HYDRO	*****	-	-	-	-	-	-	-	-	-	37.00
		HYDRO	*****	-	-	-	-	-	-	-	-	-	37.00
		HYDRO	*****	-	-	-	-	-	-	-	-	-	37.00
684	OMBILIN	ST-CO	KFW I	-	-	-	-	50.00	-	-	-	-	-
		ST-CO	KFW I	-	-	-	-	50.00	-	-	-	-	-
G T O T A L				-	-	-	-	100.00	-	-	100.00	100.00	111.00

FEB '85

PEAK LOAD, PRODUCTION AND INSTALLED CAPACITY

PLN REGION : 3

	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
SALES <GWh>	234	269	339	414	503	613	761	934	1137	1378	1665
GROWTH RATE <%>	47	15	26	22	21	22	24	23	22	21	21
LOSSES <%>	27	22	22	22	22	22	21	20	19	18	17
PROD <GWh>	320	345	434	531	645	786	963	1167	1404	1680	2006
PEAK <MW>	46	48	52	54	56	58	60	61	62	63	63
LOAD FACTOR <%>	79	82	95	112	131	155	183	218	259	304	363
=====											
INSTALLED CAPACITY <MW>											
DIESEL	65	63	61	99	127	131	130	134	148	146	152
STOF	0	0	0	0	0	0	0	0	0	0	0
STCOAL	0	0	0	0	0	100	100	100	100	100	100
HYDRO	79	79	79	79	79	79	79	79	179	279	390
MHYDRO	0	0	0	0	0	0	0	0	0	0	0
G.T	40	40	40	40	40	40	40	40	40	40	40
GEO THERM	0	0	0	0	0	0	0	0	0	0	0
TOTAL	183	181	180	217	246	350	348	353	467	565	682

FEB '85

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8-6 Installed Capacity of PLN in Riau Province, 1981

Power Station	Installed Capacity (kW)	District (Kabupaten)
Pekan Baru	12,630	- Pekanbaru
Dumai	1,637	- Dumai
Bangkinang	520	Kampar
Air Tris	40	
Rengat	656	Indragiri Hulu
Air Molek	110	
Teluk Kuantan	300	
Tembilahan	672	- Indragiri Hilir
Duri	110	Bengkalis
Bagan Siapiapi	1,042	
Bengkalis	787	
Selat Panjang	220	
Total	18,724	

Source: PLN Wilayah III (Padang and Pekanbaru)

8-7 Installed Capacity of Private Power Plants in Riau Province, 1980/81

District	Installed Cap. (kVA)	Available Cap. (kW)	No. of Private Power Plants
Pekanbaru	196,669	157,335	24
Dumai	79,060	63,248	6
Kampar	554	443	3
Indragiri Hulu	1,367	1,084	8
Indragiri Hilir	967	773	10
Bengkalis	545	436	9
Total	279,162	223,329	60

Source: PLN Wilayah III (Padang and Pekanbaru)

8-8 Installed Capacity of PLN in
West Sumatra Province, 1981

Power Station	Installed Capacity (kW)
Pakang	21,090
Solok	1,042
Sijunjung	320
Sungai Penuh	1,102
Painan	806
Pariaman	706
Surantih I, II	80
Sulit Air	120
Tapan	40
Koto Anau	160
Lempu	80
Sub-Total (1)	25,546
Batang Agam	10,500
Lubuk Sikaping	210
Padang Luar	4,560
Panti	40
Talu	40
Sub-Total (2)	15,350
Total (1)+(2)	40,896

Source: PLN Wilayah III (Padang)

8-9

Installed Capacity of Private Power Plants
in West Sumatra Province, 1980/81

District	Installed Cap. (kVA)	Available Cap. (kW)	No. of Private Power Plants
Padang	22,302	17,841	32
Solok	15,906	12,724	3
Bukit Tinggi	946	756	15
Total	39,154	31,321	50

Source: PLN Wilayah III (Padang)

8-10 Historical Record in West Sumatra Province

Year	1973	1974	1975	1976	1977	1978	1979	1980	1981	Annual Average Growth Rate (%)
Sold Energy (MWh)	22,327	25,784	28,324	31,002	35,598	38,988	48,361	53,097	70,921	16
Peak Load (kW)	6,225	7,772	7,896	8,353	10,279	12,414	15,553	19,708	23,992	18
Generated Energy (MWh)	29,444	35,705	40,737	44,682	52,894	60,421	71,566	91,140	95,861	16
Loss (MWh)	7,117	9,921	12,413	13,682	17,296	21,433	23,205	38,043	24,940	-
Loss (%)	24	28	30	31	33	35	32	42	26	-
Load Factor (%)	0.41	0.38	0.41	0.42	0.40	0.36	0.35	0.31	0.33	-
Installed Capacity (kW)	11,017	12,488	12,364	22,678	28,754	36,201	36,201	37,416	40,896	18
Available Capacity (kW)	*	*	*	15,040	19,166	25,766	25,766	33,070	34,542	18

Note: * Data is not available

Source: PLN Wilayah III (Padang)

8-11 Historical Record in Riau Province (excluding Kepulauan Riau)

Year	1973	1974	1975	1976	1977	1978	1979	1980	1981	Annual Average Growth Rate (%)
Sold Energy (MWh)	12,248	13,814	15,589	16,659	18,232	22,177	25,407	35,110	45,800	18
Peak Load (kW)	2,766	5,460	4,164	4,443	5,218	6,259	7,435	10,655	12,351	20
Generated Energy (MWh)	15,079	16,146	20,363	22,201	24,149	29,578	31,374	45,424	56,200	18
Loss (MWh)	2,831	2,332	4,774	5,542	5,917	7,401	5,967	10,314	10,400	-
Loss (%)	19	14	23	25	25	25	19	23	19	-
Load Factor (%)	50.5	28.9	42.7	42.8	39.9	40.0	39.0	37.6	42.3	-
Installed Capacity (kW)	4,396	6,912	7,036	9,772	10,285	18,954	19,164	18,985	18,724	20
Available Capacity (kW)	*	*	*	*	9,160	14,410	14,410	14,410	17,224	17

Note: * Data is not available

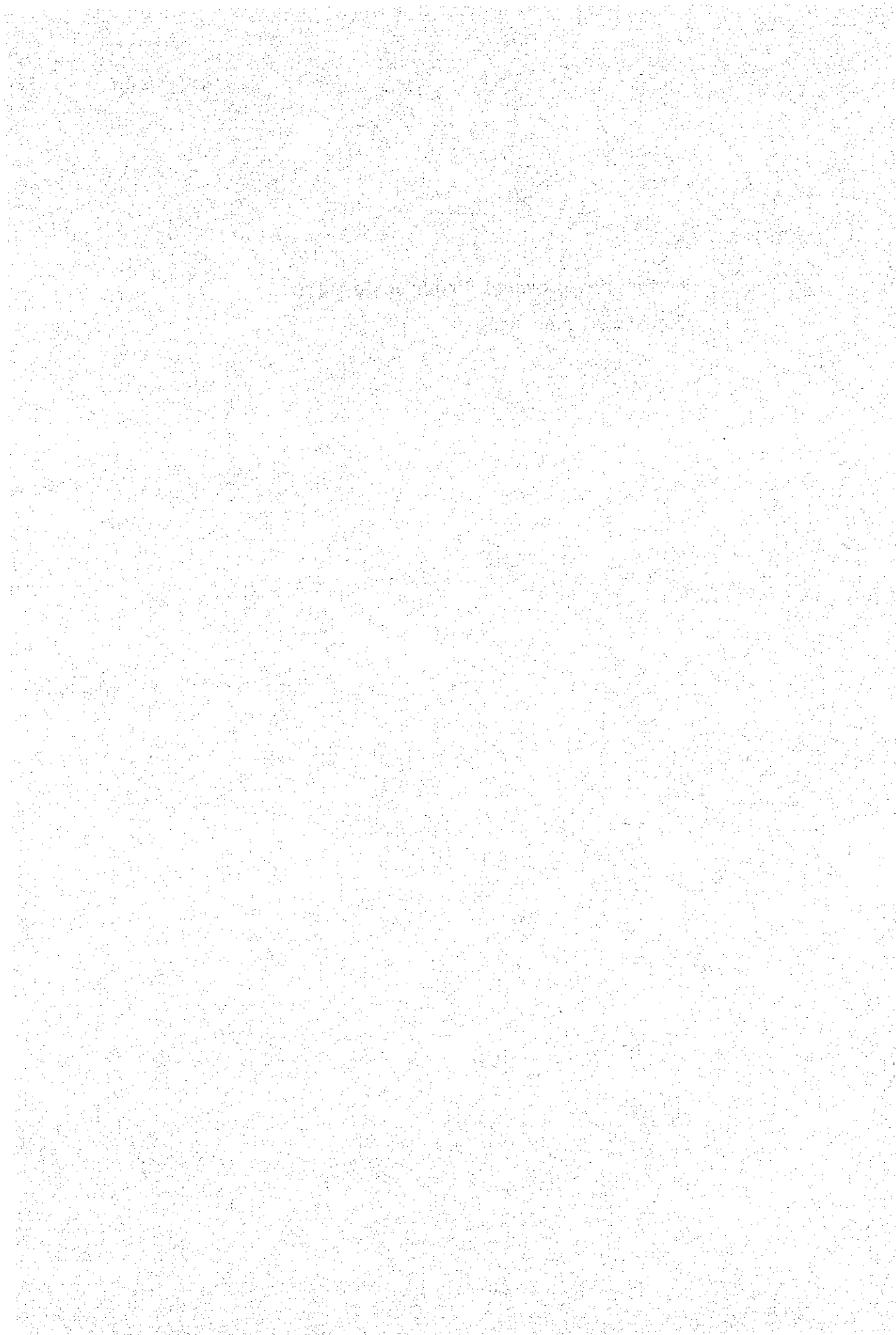
Source: PLN Wilayah III (Padang and Pekanbaru)

8-12 Historical Record of Tariff Category
in Riau Province

Year	1973/74	1975/76	1978/79	1980/81
Residential	8,776 MWh (61%)	10,551 MWh (57%)	15,010 MWh (53%)	24,816 MWh (53%)
Industrial/ Commercial	2,691 MWh (20%)	4,530 MWh (24%)	8,528 MWh (30%)	14,460 MWh (31%)
Public	2,803 MWh (20%)	3,508 MWh (19%)	4,800 MWh (17%)	7,801 MWh (16%)
TOTAL	14,270 MWh (100%)	18,589 MWh (100%)	28,338 MWh (100%)	47,077 MWh (100%)

Source: PLN Wilayah III (Padang and Pekanbaru)

Power Development Program in West
Sumatera and Riau



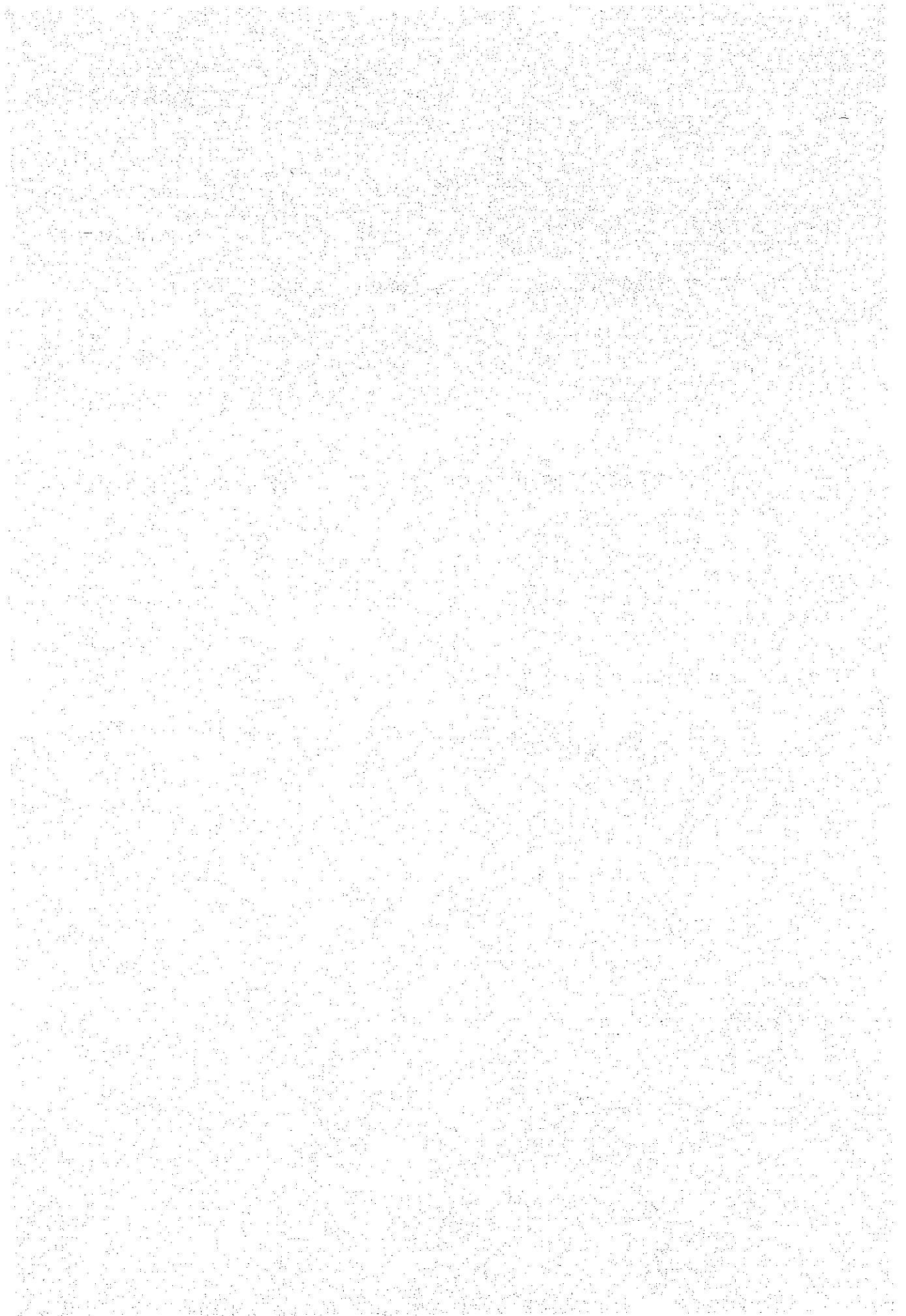
9-1 Power Development Program in West Sumatra

Year	Installed Capacity (kW)	Type	Breakdown
1981/82	4,912	hydro & diesel	ADB 3,500 kW, ABS 660 kW APLN 452 kW, OTHERS 300 kW
1982/83	12,600	diesel	FRANCE 12,600 kW
1983/84	17,900	gas-turbine & diesel	FRANCE 17,000 kW PS 900 kW
1984/85	68,000	hydro	ADB 68,000 kW (Maninjau)
1985/86	0	-	
1986/87	0	-	
1987/88	19,600	diesel	PM 19,600 kW
1988/89	19,400	"	PM 19,400 kW
1989/90	90,000	hydro	- (Singharak I)
1990/91	0	-	
1991/92	90,000	hydro	- (Singkarak II)
1992/93	0	-	
1993/94	0	-	
1994/95	150,000	steam	- (Ombilin I)
1995/96	0	-	
1996/97	60,000	steam	- (Ombilin II)
1997/98	0	-	
1998/99	13,300	diesel	-
1999/2000	29,400	"	-
2000/01	26,500	"	-

9-2 Power Development Program in Riau Province

Year	Installed Capacity (kW)	Type	Breakdown
1981/82	2,936	diesel	OECF 1,060 kW, ABS 1,540 kW APLN 116 kW, OTHERS 220 kW
	3,500	"	DENMARK 2,000 kW, ABS 500 kW APLN 1,000 kW
1982/83	14,100	"	OECF 3,000 kW, PS 350 kW PM 10,750 kW
1983/84	9,500	"	PM 9,500 kW
1984/85	16,400	"	PM 16,500 kW
1985/86	7,500	"	PM 7,500 kW
1986/87	12,500	"	PM 12,500 kW
1987/88	8,000	"	PM 8,000 kW
1988/89	19,100	"	PM 19,100 kW
1989/90	29,000	"	PM 29,000 kW
1990/91	111,000	hydro	Proposed plan (Kotapanjang)
1991/92	0	-	
1992/93	0	-	
1993/94	0	-	
1994/95	90,000	hydro	Proposed plan
1995/96	0	-	
1996/97	0	-	
1997/98	90,000	hydro	Proposed plan
1998/99	0	-	
1999/2000	0	-	

Transmission Line in Central Sumatera



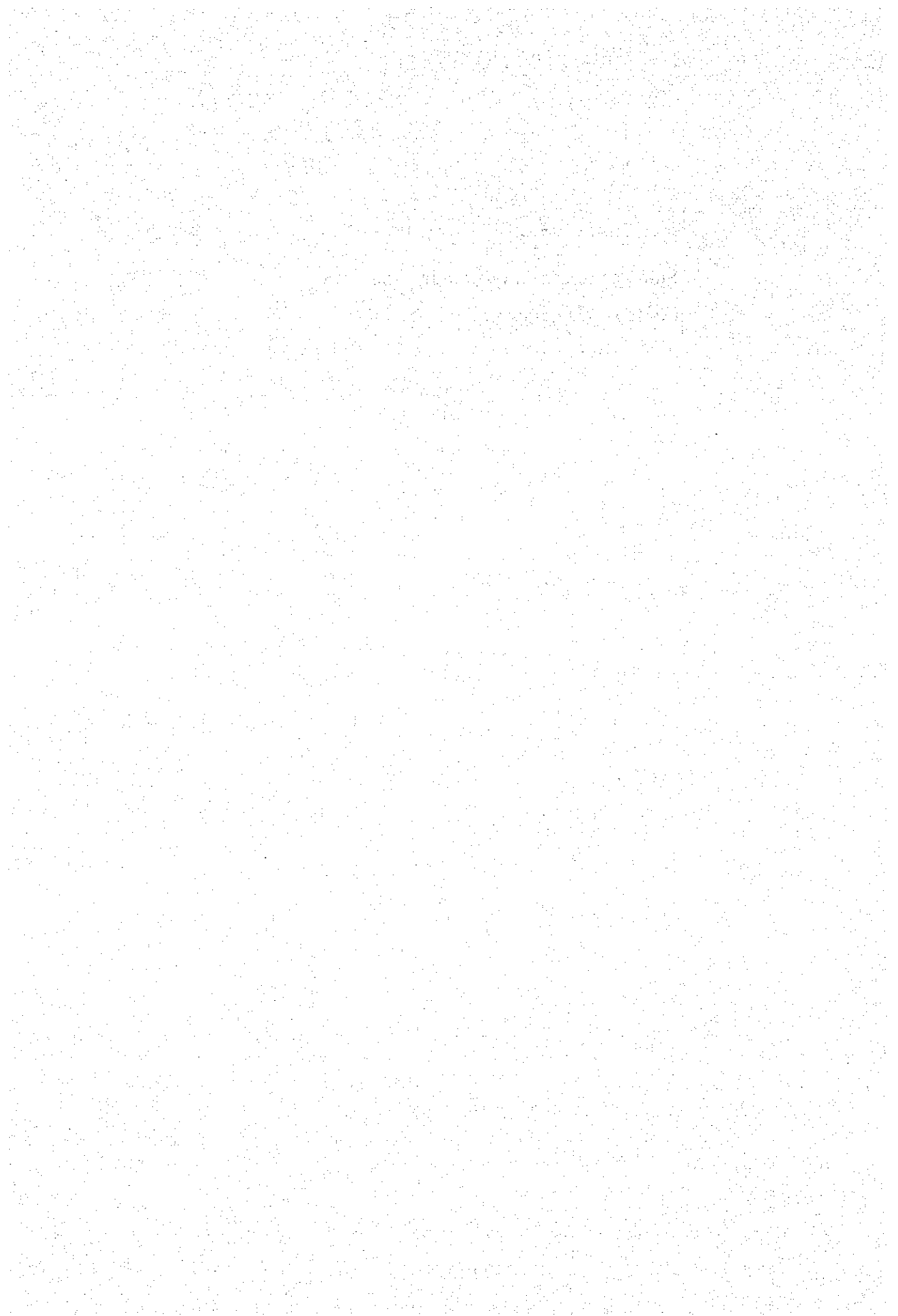
TRANSMISSION LINES
 (ON-GOING PROJECTS)

REGION : 3

FEB '85

NO	FROM	T O	TYPE	COND. TYPE	KMR	YEAR	SOURCE OF FIN.
1	BANDAR BUAT	INDARUNG	150-2-CCT	ACSR - XXX	6.0	85	K.F.W
2	INDARUNG	SOLOK	150-1ST-CCT	ACSR - XXX	40.0	85	K.F.W
3	SOLOK	PLTU DMBILIN	150-1ST-CCT	ACSR - XXX	25.0	85	K.F.W
4	PLTA MANINJAU	PADANG LUAR	150-1ST-CCT	ACSR - XXX	42.0	86	BELGIUM

Substation Transformer and Others in
Central Sumatera



11-1 SUBSTATION EXISTING

REGION : 3

SNOUT

NO	NOREC	NOLOC	LOCATION	VOLTAGE (KV)	MNFCYR	YEAR	SOURCE	CAP. (MVA)	LOAD (MW)	LF (%)	XT (%)
1	274	8	BANDAR SUAT	150/20	99	83	A.D.B.	30.0	0.0	0	0.00
2	275			150/20	99	83	A.D.B.	30.0	0.0	0	0.00
3	15	9	LUBUK ALUNG	30/6	99	70	EXISTING	.6	.2	40	0.00
4	276			150/20	99	83	A.D.B.	10.0	0.0	0	0.00
5	277			150/20	99	83	A.D.B.	10.0	0.0	0	0.00
6	279	119	PLTA MANINJAU	150/20	99	83	A.D.B.	5.0	0.0	0	0.00

FEB '85

11-2 SUBSTATION ONGOING PROJECTS

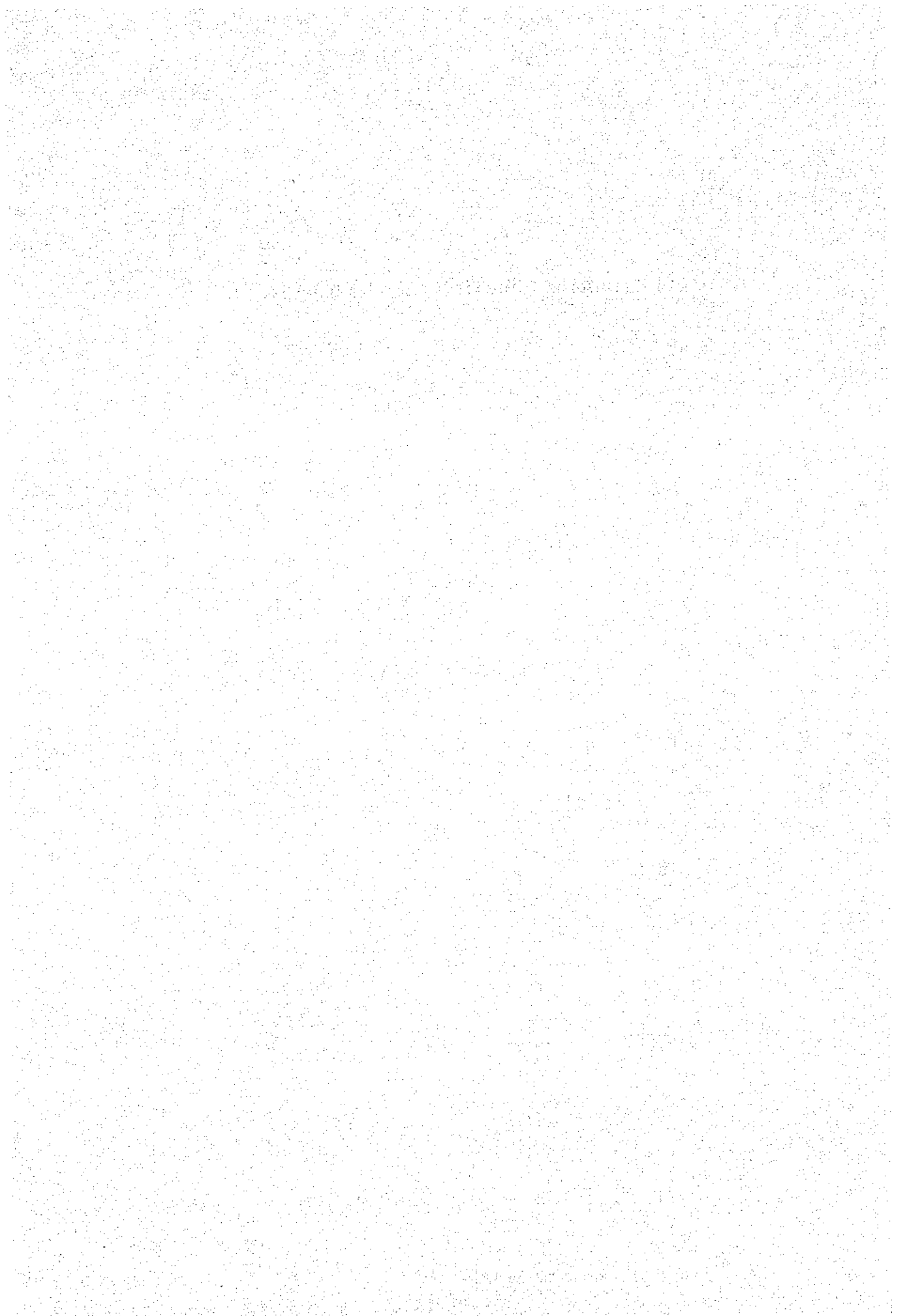
REGION : 3

SNOUT

NO	NOREC	NOLOC	LOCATION	VOLTAGE (KV)	MNFCYR	YEAR	SOURCE	CAP. (MVA)	LOAD (MW)	LF (%)	XT (%)
1	278	10	SOLUK	150/20	99	85	K.F.W	5.0	0.0	0	0.00
2	280	163	INDARUNG	150/20	99	86	BELGIUM	30.0	0.0	0	0.00
3	281			150/20	99	86	BELGIUM	30.0	0.0	0	0.00
4	282	363	PADANG LUAR	150/20	99	86	BELGIUM	20.0	0.0	0	0.00
5	410	390	PLTU OMBILIN	150/20	99	85	K.F.W	10.0	0.0	0	0.00

FEB 85

Distribution Line in Central Sumatera



12-2 Distribution Line Development Program in Riau Province

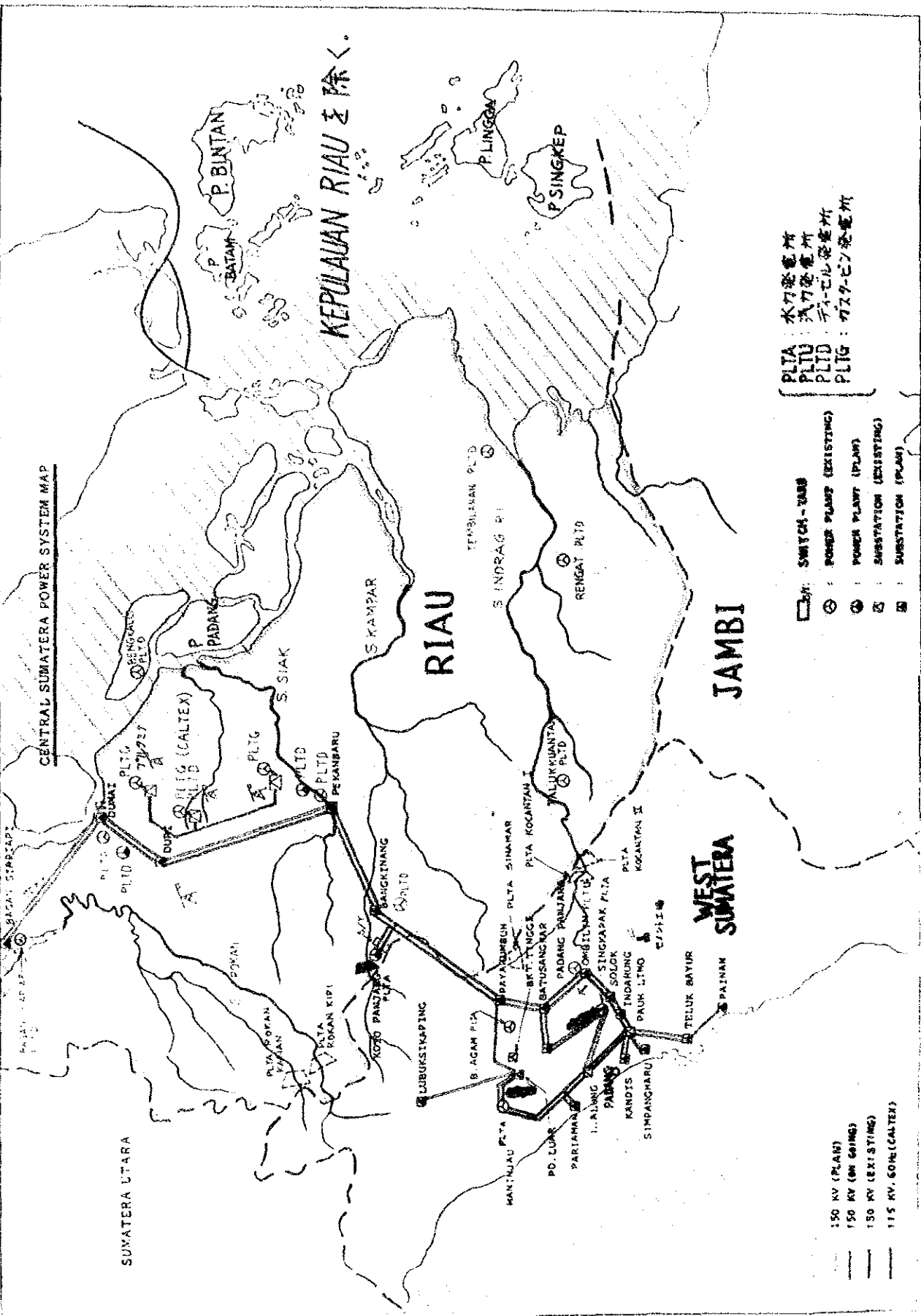
Year	1982/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
1. Medium Voltage Line												
20 kV line (km)	39	22	134	67	50	116	38	137	124	158	153	160
6 kV line (km)												
2. Low Voltage Line												
220V line (km)	78	44	267	134	100	232	76	273	249	316	307	321
3. Pole Transformer (MVA)												
	6	3	21	10	8	18	6	21	19	24	24	25

12-1 Distribution Line Development Program in West Sumatra

Year	1982/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
1. Medium Voltage Line												
20 kV line (km)	76	46	308	171	144	372	129	540	561	772	776	908
6 kV line (km)												
2. Low Voltage Line												
220V line (km)	152	92	617	342	288	745	258	1,081	1,122	1,544	1,551	1,816
3. Pole Transformer												
(MVA)	12	7	47	27	22	57	20	83	86	119	119	139

Transmission System Diagram in
Central Sumatera

CENTRAL SUMATERA POWER SYSTEM MAP



KEPULAUAN RIAU を除く

PLTA : 水力発電所
 PLTD : 火力発電所
 PLTG : ガス-ゼル発電所
 PLIG : ガスタービン発電所

SW : SWITCH-ROOM
 ⊙ : POWER PLANT (EXISTING)
 ⊙ : POWER PLANT (PLANT)
 ⊙ : SUBSTATION (EXISTING)
 ⊙ : SUBSTATION (PLANT)

150 KV (PLANT)
 150 KV (ON GOING)
 150 KV (EXISTING)
 115 KV, 60KV (CALTEX)

SUMATERA UTARA

RIAU

JAMBI

WEST SUMATERA

BAGAN SYARIP

PAJAN

PLMOPAN

BOYAI

PLTA KOKAN KIP

KOTO PANDAN

PLTA

BAIKENANG

PEKANBARU

PLTD

PLTD

PLTG

PLTG (CALTEX)

PADANG

BENGALIS

PLTD

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

PLTG

TEMBUKAN PLTD

S INDRAG RI

RENGAY PLTD

ALUKYANTA PLTD

PLTA KOCANTAN I

PLTA KOCANTAN II

PLTA KOCANTAN III

PLTA KOCANTAN IV

PLTA KOCANTAN V

PLTA KOCANTAN VI

PLTA KOCANTAN VII

PLTA KOCANTAN VIII

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PLTA KOCANTAN XXVI

PLTA KOCANTAN XXVII

PLTA KOCANTAN XXVIII

PLTA KOCANTAN XXIX

PLTA KOCANTAN XXX

PLTA KOCANTAN XXXI

PLTA KOCANTAN XXXII

PLTA KOCANTAN XXXIII

PLTA KOCANTAN XXXIV

PLTA KOCANTAN XXXV

PLTA KOCANTAN XXXVI

PLTA KOCANTAN XXXVII

PLTA KOCANTAN XXXVIII

PLTA KOCANTAN XXXIX

PLTA KOCANTAN XL

PLTA KOCANTAN XLI

PLTA KOCANTAN XLII

PLTA KOCANTAN XLIII

PLTA KOCANTAN XLIV

PLTA KOCANTAN XLV

PLTA KOCANTAN XLVI

PLTA KOCANTAN XLVII

PLTA KOCANTAN XLVIII

PLTA KOCANTAN XLIX

PLTA KOCANTAN L

PLTA KOCANTAN LI

PLTA KOCANTAN LII

PLTA KOCANTAN LIII

PLTA KOCANTAN LIV

PLTA KOCANTAN LV

PLTA KOCANTAN LVI

PLTA KOCANTAN LVII

PLTA KOCANTAN LVIII

PLTA KOCANTAN LVIX

PLTA KOCANTAN LX

PLTA KOCANTAN LXI

PLTA KOCANTAN LXII

PLTA KOCANTAN LXIII

PLTA KOCANTAN LXIV

PLTA KOCANTAN LXV

PLTA KOCANTAN LXVI

PLTA KOCANTAN LXVII

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PLTA KOCANTAN LXXXXXXXVI

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PLTA KOCANTAN LXXXXXXXVIII

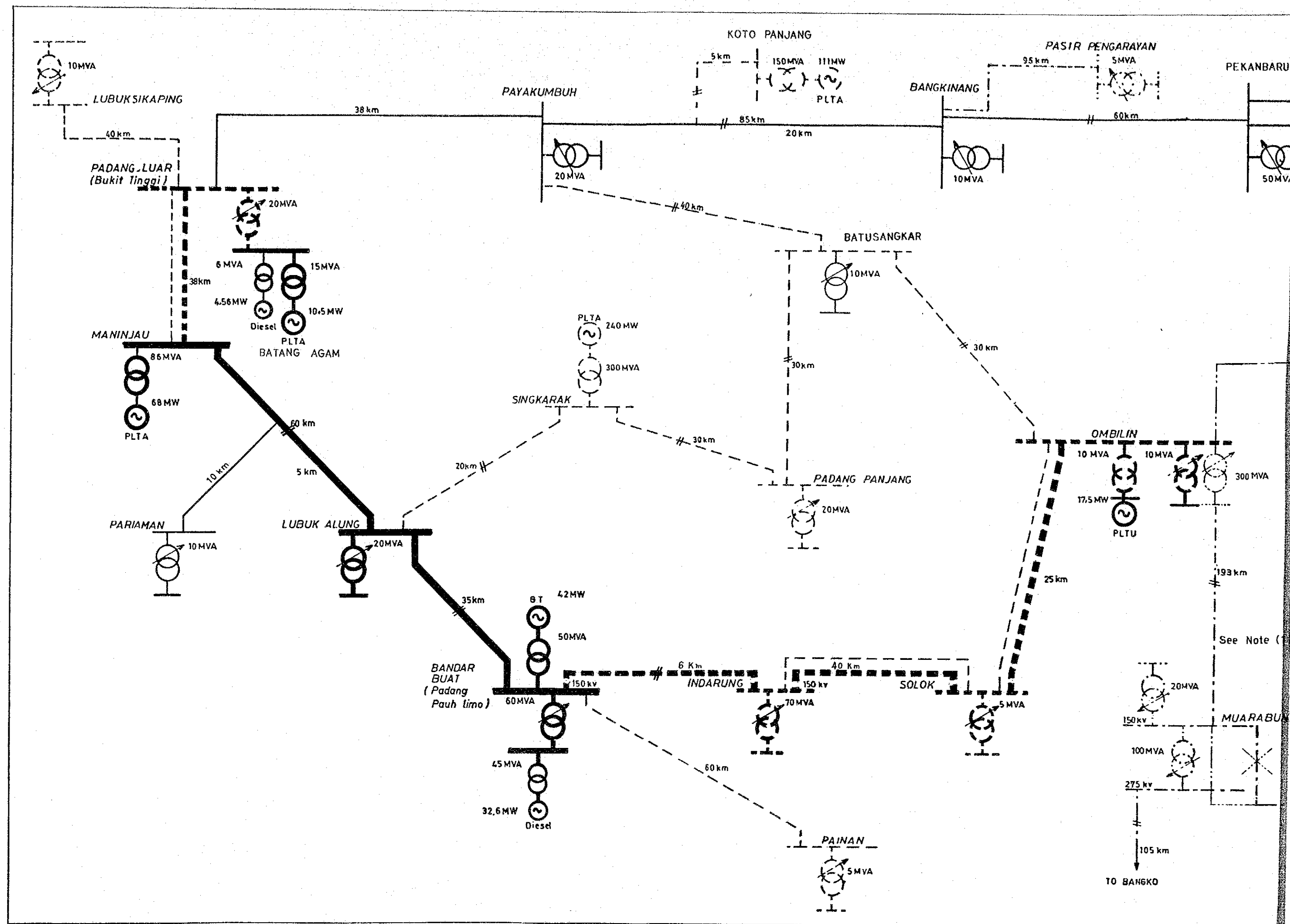
PLTA KOCANTAN LXXXXXXXIX

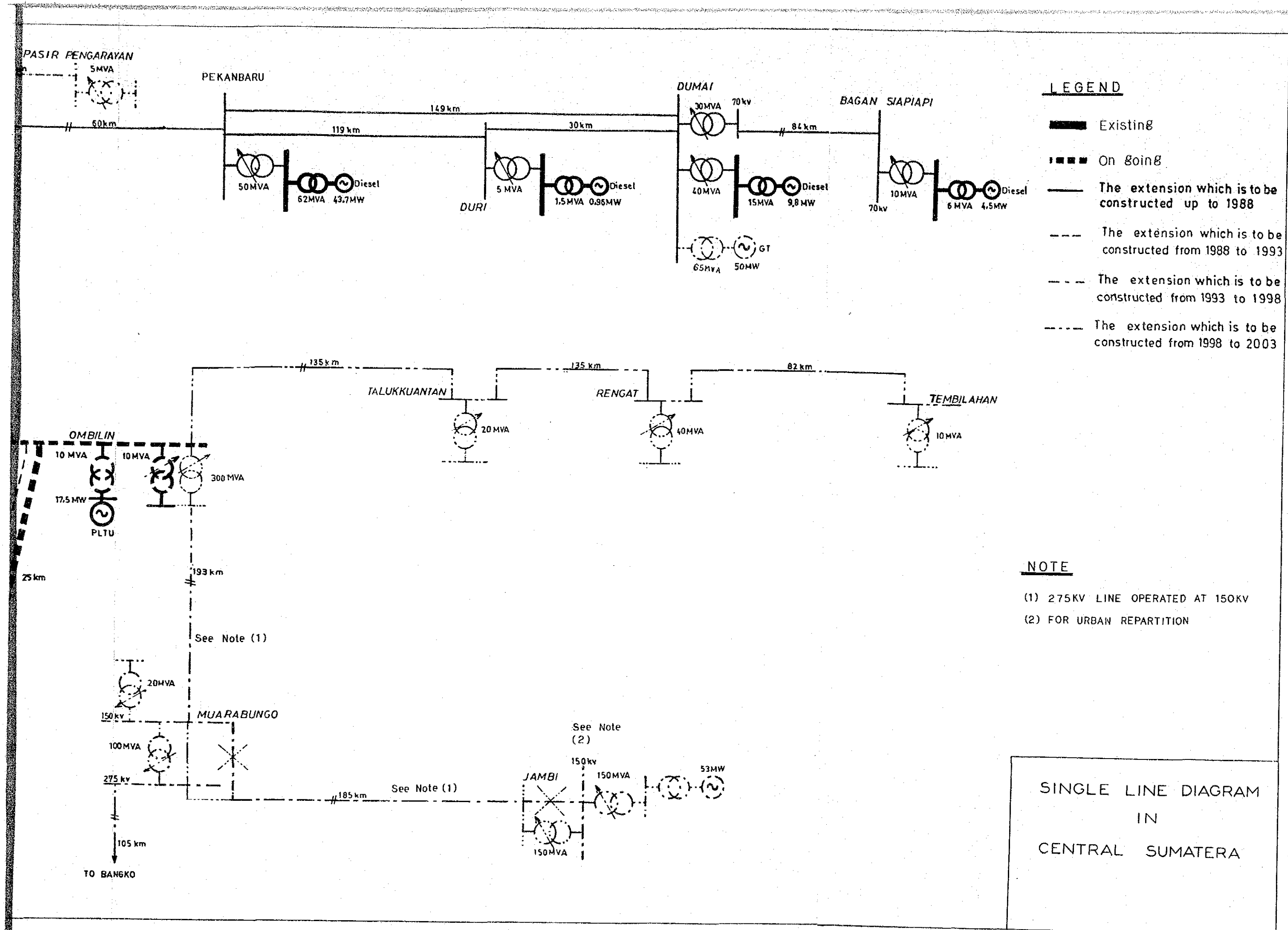
PLTA KOCANTAN LXXXXXXX

PLTA KOCANTAN LXXXXXXXI

PLTA KOCANTAN

Single Line Diagram in Central
Sumatera





LEGEND

- Existing
- - - - On going
- The extension which is to be constructed up to 1988
- - - The extension which is to be constructed from 1988 to 1993
- · · · The extension which is to be constructed from 1993 to 1998
- - - - The extension which is to be constructed from 1998 to 2003

NOTE

- (1) 275KV LINE OPERATED AT 150KV
- (2) FOR URBAN REPARTITION

SINGLE LINE DIAGRAM
IN
CENTRAL SUMATERA

JICA