

**Cost and Benefit\* of Karangates HEPP Extension  
[ Current ]**

Unit : k US \$

Year	Cost					Benefit		
	K'kates Extension		STCFPP		Total Cost	Gas Turbine Power Plant		
	Capital Cost	O & M Cost	Cap. Cost	Fuel cost		Capital Cost	Fuel Cost	Total Benefit
1993	2850				2850			
1994	14250				14250			
1995	25650				25650			
1996	14250				14250			
1997		855	7039	4258	12152	12705	13254	25959
1998		855	7039	4258	12152	12705	13254	25959
1999		855	7039	4258	12152	12705	13254	25959
2000		855	7039	4258	12152	12705	13254	25959
2001		855	7039	4258	12152	12705	13254	25959
2002		855	7039	4258	12152	12705	13254	25959
2003		855	7039	4258	12152	12705	13254	25959
2004		855	7039	4258	12152	12705	13254	25959
2005		855	7039	4258	12152	12705	13254	25959
2006		855	7039	4258	12152	12705	13254	25959
2007		855	7039	4258	12152	12705	13254	25959
2008		855	7039	4258	12152	12705	13254	25959
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2010		855	7039	4258	12152	12705	13254	25959
2011		855	7039	4258	12152	12705	13254	25959
2012		855	7039	4258	12152	12705	13254	25959
2013		855	7039	4258	12152	12705	13254	25959
2014		855	7039	4258	12152	12705	13254	25959
2015		855	7039	4258	12152	12705	13254	25959
2016		855	7039	4258	12152	12705	13254	25959
2017		855	7039	4258	12152	12705	13254	25959
2018		855	7039	4258	12152	12705	13254	25959
2019		855	7039	4258	12152	12705	13254	25959
2020		855	7039	4258	12152	12705	13254	25959
2021		855	7039	4258	12152	12705	13254	25959
2022		855	7039	4258	12152	12705	13254	25959
2023		855	7039	4258	12152	12705	13254	25959
2024		855	7039	4258	12152	12705	13254	25959
2025		855	7039	4258	12152	12705	13254	25959
2026		855	7039	4258	12152	12705	13254	25959
2027		855	7039	4258	12152	12705	13254	25959
2028		855	7039	4258	12152	12705	13254	25959
2029		855	7039	4258	12152	12705	13254	25959
2030		855	7039	4258	12152	12705	13254	25959
2031		855	7039	4258	12152	12705	13254	25959
2032		855	7039	4258	12152	12705	13254	25959
2033		855	7039	4258	12152	12705	13254	25959
2034		855	7039	4258	12152	12705	13254	25959
2035		855	7039	4258	12152	12705	13254	25959
2036		855	7039	4258	12152	12705	13254	25959
2037		855	7039	4258	12152	12705	13254	25959
2038		855	7039	4258	12152	12705	13254	25959
2039		855	7039	4258	12152	12705	13254	25959
2040		855	7039	4258	12152	12705	13254	25959
2041		855	7039	4258	12152	12705	13254	25959
2042		855	7039	4258	12152	12705	13254	25959
2043		855	7039	4258	12152	12705	13254	25959
2044		855	7039	4258	12152	12705	13254	25959
2045		855	7039	4258	12152	12705	13254	25959
2046		855	7039	4258	12152	12705	13254	25959

06-Aug-92

HIGH SCENARIO - 1 : FORECAST: HIGH, PRIVATE'S PROJECTS DATES : PROGRESSIVE

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<b>Demand - Supply</b>													
<b>Demand</b>													
1. Sales	25283	27508	34491	40905	49039	58031	67235	77651	88877	100187	112487	124980	138761
Increase (%)	8.8	22.1	21.7	22.1	19.9	18.3	15.9	15.5	14.2	13.0	12.3	11.1	11.0
2. Losses T & D	4897	4955	5789	6776	7775	8790	9721	10695	11817	12455	13239	14213	15239
(%)	14.9	14.5	14.0	13.5	13.0	12.5	12.0	11.5	11.0	10.5	10.0	9.7	8.4
3. Sent Out Energy	23980	32463	39280	47681	56813	66822	76958	88346	100293	112621	125706	139194	153999
(%)	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4. Station Use	31524	34172	41347	50191	59803	70320	81006	92995	105609	118609	132380	146519	162104
(MW)	4728	5645	6821	8268	9837	11550	13288	15187	16843	18881	21039	23259	25701
5. Gross Generation													
6. System Peak	76.1	69.1	69.2	69.4	69.4	69.5	69.6	69.9	71.8	71.7	71.8	71.9	72.0
7. System LF (%)													
<b>Supply</b>													
- Existing	6357	6357	6357	6357	5931	5931	5904	5609	5609	5609	5609	5609	5409
- On Going Projects													
Kedungombo, HEPP		23	23	23	23	23	23	23	23	23	23	23	23
Tulungagung, HEPP			36	36	36	36	36	36	36	36	36	36	36
Paiton #1, #2, STCPP		60	60	60	60	60	60	60	60	60	60	60	60
Ex Tosan Prima, GTPP		6	6	6	6	6	6	6	6	6	6	6	6
Sensayan, DIEPP		6	6	6	6	6	6	6	6	6	6	6	6
Grasik #1, #2, #3, CCPP		1080	1412	1578	1578	1578	1578	1578	1578	1578	1578	1578	1578
Sub Total	66	1169	1937	2503	2503	2503	2503	2503	2503	2503	2503	2503	2503
Committed Projects													
Salak #1, #2, GEOPP			110	110	110	110	110	110	110	110	110	110	110
Murara Karang, CCPP		324	514	514	514	514	514	514	514	514	514	514	514
Priok #1, #2, CCPP			780	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Tambak Lorok, CCPP			324	514	514	514	514	514	514	514	514	514	514
Bali, GTPP		60	60	60	60	60	60	60	60	60	60	60	60
Tulis, HEPP			13	13	13	13	13	13	13	13	13	13	13
Cirata saige II, HEPP							300	500	500	500	500	500	500
Giliman, HEPP			10	10	10	10	10	10	10	10	10	10	10
Kesamban, HEPP					33	33	33	33	33	33	33	33	33
Drajati #1, GEOPP				55	55	55	55	55	55	55	55	55	55
Dieng, GEOPP				55	55	55	55	55	55	55	55	55	55
Suralaya #5, #6, #7, STCPP				55	55	55	55	55	55	55	55	55	55
Sub Total		304	1011	2531	2564	3764	4804	4804	4804	4804	4804	4804	4804
- Planned Projects													
PLN's Projects													
Jatigede, HEPP									175	175	175	175	175
Cimandiri, HEPP									351	351	351	351	351
Ayung, HEPP								44	44	44	44	44	44
East Java, CCPP									1500	1500	1500	1500	1500
Paiton #3-#4									800	800	800	800	800
West Java I #3-#7, STCPP													2400
West Java II #1-#2, STCPP													1200
Central Java #5-#7, STCPP													3600
Java, GTPP								120	720	2180	3120	3600	4800
Sub Total								164	2790	5030	7790	10670	13870
Private's Probes													
Paiton #7, #8, STCPP					1200	1200	1200	1200	1200	1200	1200	1200	1200
Paiton #5, #6, STCPP					600	1200	1200	1200	1200	1200	1200	1200	1200
Central Java #1 - #4, STCPP					800	1200	1800	2400	2400	2400	2400	2400	2400
Cilegon, STCPP					400	400	400	400	400	400	400	400	400
West Java I #1, #2, STCPP								1200	1200	1200	1200	1200	1200
Patiha, GEOPP					40	40	40	40	40	40	40	40	40
Wayang Windu, GEOPP					40	40	40	40	40	40	40	40	40
Sub Total					2280	3480	4680	6480	6480	6480	6480	6480	6480
<b>Total Installed Capacity</b>	6423	7910	10105	11391	13278	15678	17951	19620	22246	24486	27246	30126	32928
LOLP				0.220	0.098	0.154	0.301	0.921	0.860	0.844	0.779	0.632	0.500

Energy & Load Demand Forecast  
JAVA & BALU SYSTEM (HIGH)

Physical Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population(10 <sup>3</sup> )	11031.6	112164.3	115998.8	117727.9	119592.1	121422.4	123251.1	125097.0	126958.9	128825.2	130676.5	132470.1	134262.8	
Growth Rate(%)	1.6	36.1	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	
Elect. Rate(%)	34.0	8993.0	41.4	45.3	54.8	59.9	63.3	71.1	76.8	82.4	87.9	91.4	96.7	
No. of Customers(10 <sup>3</sup> )	7300.0	9437.4	10549.2	11760.7	13095.7	14539.1	16100.5	17789.0	19502.7	21293.9	23174.2	24734.2	26312.9	
Power Contr./Cust.(VA)	628.5	628.2	628.8	620.1	618.0	614.6	613.2	611.9	610.9	610.0	609.2	608.6	608.0	
Power Contracted(MVA)	4712.0	5092.2	4874.4	6541.5	8069.4	8935.4	9072.3	10385.4	11913.6	12952.5	13996.5	15052.5	16119.8	
Growth of GDP Total(%)	8.9	7.6	7.9	8.4	7.8	8.2	8.2	8.1	8.0	7.3	7.3	7.3	7.3	
Consump./Cust.(twh)	906.0	893.9	859.2	886.9	891.2	901.5	928.7	945.1	957.7	966.4	980.4	990.4	1022.7	
PLN SALES (GWh)	6795.3	7695.3	8109.6	10401.7	11805.4	13289.9	14953.1	16812.5	18677.8	20524.2	22479.2	24719.2	27115.6	
Growth (%)	19.3	13.2	5.4	12.0	12.6	12.5	12.6	12.4	11.1	9.9	9.8	9.7	9.7	
Share to Tot.(%)	30.3	30.4	29.5	27.9	25.6	24.1	22.9	21.7	21.1	20.5	20.0	19.8	19.5	
<b>Commercial</b>														
No. of Customers	244481	264257	300366	335450	364169	394988	427444	461667	497761	535511	568755	603573	638943	
Customers Elasticity	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
Elasticity	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4	
Growth of GDP Sec.(%)	9.46	7.91	7.71	7.89	8.02	7.68	7.14	8.26	8.19	8.10	8.10	8.10	8.10	
Power Contr./Cust.(VA)	5688.0	6037.1	5692.4	5693.0	5694.1	5694.5	5694.9	5695.2	5695.2	5695.2	5695.2	5696.0	5696.2	
Power Contracted(MVA)	1399.6	1610.2	1755.1	1999.5	2433.9	2248.9	2834.7	3028.5	3239.4	3437.8	3634.3	3829.3	4029.3	
Consump./Cust.(twh)	7659.7	8518.2	7966.2	8626.8	9370.1	10066.1	10770.4	11510.3	12415.7	13422.8	14536.8	15645.9	16795.4	
PLN SALES (GWh)	1872.7	2251.0	2456.5	2893.9	3412.3	3976.0	4603.7	5314.0	6180.1	7161.2	8267.9	9374.5	10591.1	
Growth (%)	17.4	20.2	9.1	17.8	17.9	16.3	15.4	16.5	16.5	15.9	15.2	14.4	13.9	
Share to Tot.(%)	8.36	8.30	8.93	8.64	8.54	7.99	6.83	6.79	6.85	6.92	7.04	7.05	7.12	
<b>Public &amp; Others</b>														
No. of Customers	178556	195096	223348	248626	276296	306692	339450	374781	412871	451417	490183	529191	568479	
Customers Elasticity	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	
Elasticity	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.2	
Power Contr./Cust.(VA)	7823.5	7786.9	7799.5	7687.9	7651.7	7615.5	7591.3	7566.4	7544.5	7520.8	7510.0	7496.5	7474.5	
Power Contracted(MVA)	1398.0	1534.9	1724.7	1911.4	2114.1	2336.8	2576.9	2835.7	3114.8	3397.5	3681.3	3967.1	4255.3	
Consump./Cust.(twh)	9485.9	8860.2	8592.3	8606.1	8648.8	8717.1	8768.8	8819.7	8859.7	8896.7	8934.3	8974.7	9016.9	
PLN SALES (GWh)	1693.8	1872.5	2140.5	2597.6	3036.1	3476.1	3961.0	4503.1	5122.6	5824.6	6647.6	7524.5	8496.2	
Growth (%)	7.80	2.29	23.5	17.15	17.19	16.64	15.56	15.20	16.65	15.32	14.82	12.44	12.04	
Share to Tot.(%)	7.56	7.78	7.49	7.16	7.16	6.99	6.83	6.79	6.85	6.92	7.04	7.05	7.12	
<b>Industry</b>														
No. of Customers	27204	27547	36228	42584	47507	53569	60988	69337	77221	85005	93423	102551	112854	
Elasticity	1.2	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	
Growth of GDP Sec.(%)	14.45	14.82	13.76	15.95	11.56	12.76	13.85	15.69	11.37	11.20	11.01	10.55	10.69	
Power Contr./Cust.(VA)	18721.1	19881.9	22439.0	23251.6	26958.2	24851.3	23662.4	22638.4	21847.1	21245.7	20692.5	20198.2	19728.0	
Power Contracted(MVA)	3051.0	3478.6	8128.4	9901.3	12397.5	13312.7	14433.0	15693.7	16884.2	18059.5	19331.4	20799.0	22265.1	
Energy Ind. Demand(GWh)	20366.2	23866.3	26997.2	31793.9	35408.3	39919.6	45448.5	51670.4	57454.9	63454.9	69621.9	76421.5	84100.8	
Energy Big Cust.(GWh)	0.0	0.0	3515.0	1848.9	3677.8	101.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CapW Power (GWh)	8326.1	10082.5	12195.7	13000.9	11329.6	10990.1	9266.8	8265.9	8209.7	8291.5	8289.3	8277.2	8278.4	
CapW Takeover(GWh)	0.0	0.0	0.0	0.0	0.0	2533.5	2220.8	1269.6	2109.8	2014.9	2128.6	2125.1	2104.0	
Share PLN to Tot.(%)	59.1	57.4	54.8	59.0	68.0	74.7	79.6	82.1	85.7	89.5	92.4	95.2	97.4	
PLN SALES (GWh)	3260.1	3160.8	34801.5	18733.0	24072.7	29829.5	36181.7	42404.5	49335.7	56790.2	64333.5	72744.3	80875.7	
Growth (%)	25.64	12.99	8.80	26.56	28.50	23.91	21.29	17.20	16.31	14.91	13.46	13.07	11.32	
Share to Tot.(%)	33.7	33.8	33.8	33.9	36.8	40.8	42.3	43.1	43.5	44.2	44.7	44.7	44.8	
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	7856.2	8579.9	10685.1	11775.9	12446.7	13051.0	13667.0	14276.8	14876.8	15477.7	16083.2	16689.6	17297.3	
Power Contracted(MVA)	12595.6	13722.9	17482.7	20263.8	22853.1	25867.8	28379.2	31038.8	33719.9	36406.9	39202.6	42103.5	44846.1	
PLN SALES (GWh)	22401.8	25282.6	27506.1	30493.5	33003.3	35603.3	38234.6	40967.6	43765.6	46616.8	49467.4	52326.9	55188.1	
Growth Rate(%)	19.4	12.9	8.8	21.7	22.1	19.9	18.3	15.9	14.2	12.3	11.1	11.0	11.0	
T & D Loss(%)	15.2	14.9	14.5	14.0	13.5	12.5	12.0	11.5	11.0	10.5	10.0	9.7	9.4	
Energy Sent Out(GWh)	26669.6	29979.7	32463.2	39279.8	47681.4	56813.5	66821.7	76955.7	88345.6	100291.1	112621.3	125706.2	139193.5	
Plant Use (%)	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Production (GWh)	28047.8	31524.4	34171.8	41347.2	50190.9	59803.4	70320.1	81006.0	92995.3	105599.5	118608.7	132380.8	146519.5	
Load Factor (%)	70.1	76.1	69.1	69.2	69.3	69.4	69.5	69.6	69.9	71.6	71.7	71.8	71.9	
Peak Load (MW)	4565.4	4726.0	5643.5	6821.1	8267.0	9837.0	11530.2	13286.5	15187.3	16842.6	18581.2	21008.5	23258.6	

\* Actual & Estimated (1991/92)

† Lower in production

DKL DIVISION

MBI 1992

**Economic Evaluation for  
Kesamben HEPP**

**Assumption For Cost and Benefit**  
**Kesamben HEPP**

**Cost :**

- Total Project Cost of Kesamben HEPP = 37 juta US \$

**Benefit :**

- Capacity - Benefit from GTPP = 23 MW

- Energy - Benefit from GTPP = 75 GWh/year

**Assumption :**

Description	Unit	GTPP
Capital cost	US \$/kW	560
Economic life time	Years	20
Cap. Recovery Factor	pu	0.1339
O & M fixed	US \$/kW-yr	14
kW adj. factor	pu	1.090
Capacity-value	US \$/kW-yr	97
Fuel type		HSD
Fuel cost	US \$/ton, US \$/bbl	24
Heat content	kcal/kg	11000
Efficiency	%	30
Specific gravity	kg/l	0.85
Fuel cost	US \$/kWh	0.0460
O & M var	US \$/kWh	0.0014
kWh adj. factor	pu	1.017
Energy Value	US \$/kWh	0.0482

06-Aug-92

Net Benefit: = [ 30.850 - 29.685 ] juta US \$ = 1.165 juta US \$  
( Base year 1992 )

L-2KSBN

**Cost and Benefit of Kesamben HEPP**  
**[ Base Year 1992; discount factor = 12 % ]**

Unit : k US \$

Year	Cost			Benefit		
	Cost of Kesamben HEPP			Gas Turbine Power Plant		
	Capital Cost	O & M Cost	Total Cost	Capital Cost	Fuel Cost	Total Benefit
1993	1652		1652			
1994	7374		7374			
1995	11851		11851			
1996	5879		5879			
1997		315	315	1266	2051	3317
1998		281	281	1130	1831	2961
1999		251	251	1009	1635	2644
2000		224	224	901	1460	2361
2001		200	200	804	1303	2108
2002		179	179	718	1164	1882
2003		160	160	641	1039	1680
2004		142	142	573	928	1500
2005		127	127	511	828	1340
2006		114	114	456	740	1196
2007		101	101	408	660	1068
2008		91	91	364	590	954
2009		81	81	325	526	851
2010		72	72	290	470	760
2011		64	64	259	420	679
2012		58	58	231	375	606
2013		51	51	206	335	541
2014		46	46	184	299	483
2015		41	41	165	267	431
2016		37	37	147	238	385
2017		33	33	131	213	344
2018		29	29	117	190	307
2019		26	26	105	170	274
2020		23	23	93	151	245
2021		21	21	83	135	219
2022		19	19	74	121	195
2023		17	17	66	108	174
2024		15	15	59	96	156
2025		13	13	53	86	139
2026		12	12	47	77	124
2027		11	11	42	68	111
2028		9	9	38	61	99
2029		8	8	34	55	88
2030		7	7	30	49	79
2031		7	7	27	44	70
2032		6	6	24	39	63
2033		5	5	21	35	56
2034		5	5	19	31	50
2035		4	4	17	28	45
2036		4	4	15	25	40
2037		3	3	14	22	36
2038		3	3	12	20	32
2039		3	3	11	18	28
2040		2	2	10	16	25
2041		2	2	9	14	23
2042		2	2	8	13	20
2043		2	2	7	11	18
2044		2	2	6	10	16
2045		1	1	5	9	14
2046		1	1	5	8	13
<b>Total</b>			<b>29685</b>			<b>30850</b>
<b>Net Benefit [ Total Benefit - Total Cost ] =</b>			<b>1165</b>			

**Cost and Benefit of Kesamben HEPP  
[ Current ]**

Unit : k US \$

Year	Cost			Benefit		
	Cost of Kesamben HEPP			Gas Turbine Power Plant		
	Capital Cost	O & M Cost	Total Cost	Capital Cost	Fuel Cost	Total Benefit
1993	1850		1850			
1994	9250		9250			
1995	16650		16650			
1996	9250		9250			
1997		555	555	2231	3615	5845
1998		555	555	2231	3615	5845
1999		555	555	2231	3615	5845
2000		555	555	2231	3615	5845
2001		555	555	2231	3615	5845
2002		555	555	2231	3615	5845
2003		555	555	2231	3615	5845
2004		555	555	2231	3615	5845
2005		555	555	2231	3615	5845
2006		555	555	2231	3615	5845
2007		555	555	2231	3615	5845
2008		555	555	2231	3615	5845
2009		555	555	2231	3615	5845
2010		555	555	2231	3615	5845
2011		555	555	2231	3615	5845
2012		555	555	2231	3615	5845
2013		555	555	2231	3615	5845
2014		555	555	2231	3615	5845
2015		555	555	2231	3615	5845
2016		555	555	2231	3615	5845
2017		555	555	2231	3615	5845
2018		555	555	2231	3615	5845
2019		555	555	2231	3615	5845
2020		555	555	2231	3615	5845
2021		555	555	2231	3615	5845
2022		555	555	2231	3615	5845
2023		555	555	2231	3615	5845
2024		555	555	2231	3615	5845
2025		555	555	2231	3615	5845
2026		555	555	2231	3615	5845
2027		555	555	2231	3615	5845
2028		555	555	2231	3615	5845
2029		555	555	2231	3615	5845
2030		555	555	2231	3615	5845
2031		555	555	2231	3615	5845
2032		555	555	2231	3615	5845
2033		555	555	2231	3615	5845
2034		555	555	2231	3615	5845
2035		555	555	2231	3615	5845
2036		555	555	2231	3615	5845
2037		555	555	2231	3615	5845
2038		555	555	2231	3615	5845
2039		555	555	2231	3615	5845
2040		555	555	2231	3615	5845
2041		555	555	2231	3615	5845
2042		555	555	2231	3615	5845
2043		555	555	2231	3615	5845
2044		555	555	2231	3615	5845
2045		555	555	2231	3615	5845
2046		555	555	2231	3615	5845

06-Aug-92

**Notes On :**  
**The Role and Viability of Warsamson HEPP**  
**In Sorong System**

**August 1992**

**Directorate of Planning**  
**PERUSAHAAN UMUM LISTRIK NEGARA**

COV-KSBN



## **Warsamson HEPP.**

### **The Role And Viability Of The Project In Sorong System. (August 1992)**

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#### **1. Background**

Warsamson HEPP is located in the village of Malano, Sorong regency - Irianjaya Province as shown in Figure-1

Warsamson HEPP already identified in 1983 in Hydro Power Potential Study, (HPPS) conducted by Nippon Koei.

In 1990 INA Consultant of Japan carried out a Reconnaissance survey to evaluate the result of the HPPS

In 1991 consultant PT Geo Ace has been selected by PLN to carry out the Pre-Feasibility Study of this proposed project.

#### **2. Demand Forecast And Capacity Expansion Plan**

Warsamson HEPP will supply the Sorong load centre. At present, Sorong load centre supplied by Diesel Power Plants, consist of two power station (Klademak Power Station and Klasaman Power Station) with total installed capacity of 13 MW as shown in Table - 1.

During the last four years (1987-1991) the average growth rate of 16.5 % per-year. In year 1991/92 the demand of Sorong load centre was 31.1 GWh (in term of energy production) and 8 MW (in term of peak load).

The demand projection for Sorong is prepared which concluded with an average growth of 5.5 % per-year from 1992/93 until the year of 2010/2011 as shown in Table -2.

Expansion plan associated with the growth demand is shown in Table-3.

#### **3. The Role Of Warsamson HEPP**

Based on the Pre-Feasibility study report April 1992, the main features of the project are as follows:

Location : Warsamsaon River

Type : Run off River

Catchment Area : 1460 sq. km

warsam

Average discharge : 72.73 cub.m/sec

Head : 27.03 m

Installed Capacity : 15.21 MW

Energy Production,

Firm Energy : 16.88 GWh

Secondary : 27.29 GWh

Total Project Cost : 17.71 M US\$ (based cost 1992)

The role of the proposed project is to reduced the utilization of oil diesel oil plants and to anticipated the future growth demand (1992-2010) which estimated at 5.5 % per-year.

The commercial operation date of the proposed project is expected to be in operation year 2000/01, by considering that these stage can be implemented :

- Feasibility Study : 1.5 years
- Detailed design : 1.5 years
- Construction : 5.0 years

#### 4. The Viability

By considering that the benefit of the proposed projects is to substitute diesel oil fired which will gain Net Benefit of Million 8.4 US \$ (in present worth value of year 1992) during it's economic life (2000 - 2049).

Detailed assumptions and calculations is shown in Attachment -1

#### 5. Conclusion

1. The proposed projects will be functioned to replacing the existing diesel oil fired plants, and to provide sufficient supply in order to cope future demand.
2. Rough static economic calculation shows that implementation of the projects is economically attractive, by considering the net benefit during it's economic life of million 8.4 M US\$ (in present worth of year 1992).
3. Detailed study will be conducted in the proposed project study, both their economic and technical viability.

Figure-1. Location Map of Warsamson HEPP



Table -1

## Existing Facilities Of Sorong System

No.	Manufactured	Comm. Operation Year	Installed Capacity [MW]	Available Capacity [MW]	Specific fuel consumption [l/kWh]	Efficiency [%]	Remark
	<b>Klademak Power Station</b>						
1.	CATERPILLAR	1974	0.25	0.00	-	-	out of operation
2.	CATERPILLAR	1974	0.25	0.00	-	-	out of operation
3.	SWD	1965	1.02	1.02	0.35	27	bad
4.	SWD	1977	0.54	0.54	0.33	28	good
5.	SWD	1977	0.54	0.54	0.33	28	good
6.	SWD	1977	0.54	0.54	0.33	28	good
7.	COCKERILL	1984	1.10	1.10	0.28	33	good
8.	COCKERILL	1984	1.10	1.10	0.28	33	good
	<b>Klasaman Power Station</b>						
1.	MAK	1986	2.54	2.54	0.25	37	good
2.	MAK	1986	2.54	2.54	0.25	37	good
3.	MAK	1986	2.54	2.54	0.25	37	good
Total			12.96	12.46			

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Table-3

Capacity Expansion Plan of  
Sorong System

Unit: MW

No.	Descriptions	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
1	Existing	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96	12.96
2	Unavailable	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
3	Planned and Commit. Projects													
	Diesel	-	-	2.50	5.00	5.00	5.00	5.00	7.50	7.50	7.50	7.50	7.50	7.50
	Warsamson HEPP	-	-	-	-	-	-	-	-	15.21	15.21	15.21	15.21	15.21
3	Reserve requirement													
	- Operational	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54	2.54
	- Maintenance	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Total Reserve Requirement	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64
4	Effective Capacity	8.82	8.82	11.32	13.82	13.82	13.82	13.82	16.32	31.53	31.53	31.53	31.53	31.53
5	Peak Load	8.00	8.64	9.17	9.74	10.34	10.98	11.65	12.36	13.03	13.74	14.48	15.24	16.03
6	Balance	0.81	0.18	2.14	4.08	3.48	2.84	2.16	3.96	18.50	17.79	17.05	16.28	15.50

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**Attachment -1**

**Economic Evaluation for  
Warsamson HEPP**

**Assumption For Cost and Benefit  
Warsamson HEPP**

**Cost :**

- Total Project Cost of Warsamson HEPP = 17.71 juta US \$

**Benefit :**

- Capacity - Benefit from Diesel PP = 15.21 MW

- Energy - Benefit from Diesel = 44.17 GWh/year

**Assumption :**

Description	Unit	Diesel
Capital cost	US \$/kW	1000
Economic life time	Years	20
Cap. Recovery Factor	pu	0.1339
O & M fixed	US \$/kW-yr	25
kW adj. factor	pu	1.090
Capacity-value	US \$/kW-yr	173
Fuel type		HSD
Fuel cost	US \$/ton, US \$/bbl	24
Heat content	kcal/kg	11000
Efficiency	%	28
Specific gravity	kg/l	0.85
Fuel cost	US \$/kWh	0.0493
O & M var	US \$/kWh	0.0015
kWh adj. factor	pu	1.017
Energy Value	US \$/kWh	0.0516

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Net Benefit: = [ 18.493 - 10.115 ] juta US \$ = 8.378 juta US \$  
( Base year 1992 )

L-WRS



**Cost and Benefit of Kesamben HEPP**  
**[ Base Year 1992; discount factor = 12 % ]**

Unit : k US \$

Year	Cost			Benefit		
	Cost of Warsamson HEPP			Diesel Power Plant		
	Capital Cost	O & M Cost	Total Cost	Capital Cost	Fuel Cost	Total Benefit
1996	563		563			
1997	2512		2512			
1998	4038		4038			
1999	2003		2003			
2000		107	107	1064	921	1985
2001		96	96	950	823	1772
2002		86	86	848	734	1583
2003		76	76	757	656	1413
2004		68	68	676	585	1262
2005		61	61	604	523	1126
2006		54	54	539	467	1006
2007		49	49	481	417	898
2008		43	43	430	372	802
2009		39	39	384	332	716
2010		35	35	343	297	639
2011		31	31	306	265	571
2012		28	28	273	236	510
2013		25	25	244	211	455
2014		22	22	218	188	406
2015		20	20	194	168	363
2016		18	18	174	150	324
2017		16	16	155	134	289
2018		14	14	138	120	258
2019		12	12	124	107	230
2020		11	11	110	95	206
2021		10	10	98	85	184
2022		9	9	88	76	164
2023		8	8	79	68	146
2024		7	7	70	61	131
2025		6	6	63	54	117
2026		6	6	56	48	104
2027		5	5	50	43	93
2028		4	4	45	39	83
2029		4	4	40	34	74
2030		4	4	36	31	66
2031		3	3	32	27	59
2032		3	3	28	25	53
2033		3	3	25	22	47
2034		2	2	23	20	42
2035		2	2	20	17	38
2036		2	2	18	16	34
2037		2	2	16	14	30
2038		1	1	14	12	27
2039		1	1	13	11	24
2040		1	1	11	10	21
2041		1	1	10	9	19
2042		1	1	9	8	17
2043		1	1	8	7	15
2044		1	1	7	6	14
2045		1	1	6	6	12
2046		1	1	6	5	11
2047		1	1	5	4	10
2048		0	0	5	4	9
2046		1	1	6	5	11
2047		1	1	5	4	10
2048		0	0	5	4	9
2049		0	0	4	4	8
<b>Total</b>			<b>10115</b>			<b>18493</b>
<b>Net Benefit [ Total Benefit - Total Cost ] = 8378</b>						

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EC-WRS

**Cost and Benefit of Warsamson HEPP  
[ Current ]**

Unit : k US \$

Year	Cost			Benefit		
	Cost of Warsamson HEPP			Diesel Power Plant		
	Capital Cost	O & M Cost	Total Cost	Capital Cost	Fuel Cost	Total Benefit
1996	886		886			
1997	4428		4428			
1998	7970		7970			
1999	4428		4428			
2000		266	266	2634	2281	4915
2001		266	266	2634	2281	4915
2002		266	266	2634	2281	4915
2003		266	266	2634	2281	4915
2004		266	266	2634	2281	4915
2005		266	266	2634	2281	4915
2006		266	266	2634	2281	4915
2007		266	266	2634	2281	4915
2008		266	266	2634	2281	4915
2009		266	266	2634	2281	4915
2010		266	266	2634	2281	4915
2011		266	266	2634	2281	4915
2012		266	266	2634	2281	4915
2013		266	266	2634	2281	4915
2014		266	266	2634	2281	4915
2015		266	266	2634	2281	4915
2016		266	266	2634	2281	4915
2017		266	266	2634	2281	4915
2018		266	266	2634	2281	4915
2019		266	266	2634	2281	4915
2020		266	266	2634	2281	4915
2021		266	266	2634	2281	4915
2022		266	266	2634	2281	4915
2023		266	266	2634	2281	4915
2024		266	266	2634	2281	4915
2025		266	266	2634	2281	4915
2026		266	266	2634	2281	4915
2027		266	266	2634	2281	4915
2028		266	266	2634	2281	4915
2029		266	266	2634	2281	4915
2030		266	266	2634	2281	4915
2031		266	266	2634	2281	4915
2032		266	266	2634	2281	4915
2033		266	266	2634	2281	4915
2034		266	266	2634	2281	4915
2035		266	266	2634	2281	4915
2036		266	266	2634	2281	4915
2037		266	266	2634	2281	4915
2038		266	266	2634	2281	4915
2039		266	266	2634	2281	4915
2040		266	266	2634	2281	4915
2041		266	266	2634	2281	4915
2042		266	266	2634	2281	4915
2043		266	266	2634	2281	4915
2044		266	266	2634	2281	4915
2045		266	266	2634	2281	4915
2046		266	266	2634	2281	4915
2047		266	266	2634	2281	4915
2048		266	266	2634	2281	4915
2049		266	266	2634	2281	4915

# CAPACITY EXPANSION PLAN

JAVA - BALI SYSTEM

PLN'S REGIONAL AREA

6 August 1992

- P L N -

DIRECTORATE OF PLANNING

Submitted to JICA Mission

HIGH SCENARIO - 1 : FORECAST: HIGH, PRIVATE'S PROJECTS DATES : PROGRESSIVE

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<b>Demand - Supply</b>													
<b>Demand</b>													
1. Sales	25283	27508	33491	40905	49039	58031	67235	77651	88677	100187	112487	124980	138761
Increase (%)	-	8.8	21.7	22.1	19.9	18.3	15.9	15.5	14.2	13.0	12.3	11.1	11.0
2. Losses T & D	4697	4955	5789	6776	7775	8790	9721	10695	11617	12455	13239	14213	15239
Increase (%)	14.9	14.5	14.0	13.5	13.0	12.5	12.0	11.5	11.0	10.5	10.0	9.7	9.4
3. Sent Out Energy	29980	32463	39280	47681	56913	66822	76956	88346	100293	112621	125708	139194	153999
4. Station Use	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5. Gross Generation	31524	34172	41347	50191	59803	70320	81006	92995	105609	118603	132380	146519	162104
6. System Peak	4728	5645	6821	8268	9937	11550	13286	15187	16843	18681	21039	23259	25701
7. System LF	76.1	69.1	69.2	69.3	69.4	69.5	69.6	69.9	71.6	71.7	71.8	71.9	72.0
<b>Supply</b>													
- Existing	6357	6357	6357	6357	5931	5931	5904	5609	5609	5609	5609	5609	5409
- On Going Projects													
Kedungombo, HEPP		23	23	23	23	23	23	23	22	23	23	23	23
Tulungagung, HEPP			36	36	36	36	36	36	36	36	36	36	36
Palon #1, #2, STCPP		400	400	800	800	800	800	800	800	800	800	800	800
Ex Tosan Prima, GTPP	60	60	60	60	60	60	60	60	60	60	60	60	60
Senayan, DIEPP	6	6	6	6	6	6	6	6	6	6	6	6	6
Gresik #1, #2, #3, CCPP	1080	1080	1412	1578	1578	1578	1578	1578	1578	1578	1578	1578	1578
Sub Total	66	1169	1937	2503	2503	2503	2503	2503	2503	2503	2503	2503	2503
Committed Projects													
Salak #1, #2, GEOPP			110	110	110	110	110	110	110	110	110	110	110
Muara Karang, CCPP		324	514	514	514	514	514	514	514	514	514	514	514
Plokk #1, #2, CCPP			780	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Tambak Lorok, CCPP		60	60	60	60	60	60	60	60	60	60	60	60
Bali, GTPP			13	13	13	13	13	13	13	13	13	13	13
Tulla, HEPP													
Cirata stage II, HEPP			10	10	10	10	10	10	10	10	10	10	10
Ciliman, HEPP													
Kesamben, HEPP				33	33	33	33	33	33	33	33	33	33
Drajat #1, GEOPP				55	55	55	55	55	55	55	55	55	55
Dieng, GEOPP				55	55	55	55	55	55	55	55	55	55
Surabaya #5, #6, #7, STCPP				1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Sub Total		384	1611	2564	3764	4864	4864	4864	4864	4864	4864	4864	4864
Planned Projects													
PLN's Projects													
Jaligede, HEPP									175	175	175	175	175
Cinandit, HEPP									351	351	351	351	351
Ayung, HEPP								44	44	44	44	44	44
East Java, CCPP									1500	1500	1500	1500	1500
Palton #3-#4									800	800	800	800	800
West Java #3-#7, STCPP													1200
West Java #1-#2, STCPP													2400
Central Java #5-#7, STCPP													10670
Sub Total													13670
Private's Projects													
Palton #7, #8, STCPP				1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Palton #5, #6, STCPP				600	1200	1200	1200	1200	1200	1200	1200	1200	1200
Central Java #1-#4, STCPP				600	1200	1200	1200	1200	1200	1200	1200	1200	1200
Cilegon, STCPP				400	400	400	400	400	400	400	400	400	400
West Java #1, #2, STCPP													1200
Paluh, GEOPP				40	40	40	40	40	40	40	40	40	40
Wayang Windu, GEOPP				40	40	40	40	40	40	40	40	40	40
Sub Total				2280	3480	4680	4680	6480	6480	6480	6480	6480	6480
Total Installed Capacity	5423	7910	10105	11391	13278	15678	17951	19620	22246	24486	27246	30126	32926
LOLP				0.220	0.098	0.154	0.301	0.921	0.860	0.844	0.779	0.632	0.300

Energy & Load Demand Forecast  
JVA & BALL SYSTEM (HIGH)

Fiscal Year	1990*	1991#	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>3</sup> )	110515.6	112166.3	113998.8	115855.1	117772.9	119592.1	121422.4	123251.1	125097.0	126953.9	128825.2	130670.5	132470.1	134262.8
Growth Rate (%)	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4
Electric Ratio (%)	34.0	36.1	41.4	45.5	49.9	54.8	59.9	65.3	71.1	76.8	82.4	87.9	93.4	98.7
No. of Customers (10 <sup>3</sup> )	7506.0	8093.0	9437.4	10549.2	11760.7	13055.7	14359.1	16106.5	17789.0	19502.7	21254.9	22974.2	24754.2	26512.3
Power Contr./Cust.(MVA)	624.3	624.2	625.8	620.1	618.0	616.2	614.6	613.2	611.9	610.9	610.9	609.2	608.6	608.0
Power Contracted (MVA)	4712.0	5099.2	5874.4	6541.5	7248.4	8069.4	8952.3	9872.3	10885.4	11913.6	12953.5	13996.5	15051.5	16119.8
-Growth of GDP Tot. (%)	8.9	7.8	7.9	8.4	7.8	8.2	8.1	8.1	8.2	8.1	7.3	7.3	7.3	7.3
Consump./Cust.(twb)	906.9	910.9	859.3	886.9	891.2	901.5	913.7	928.7	945.1	957.7	966.4	980.4	999.4	1022.7
PLN SALES (GWh)	6795.3	7695.3	8109.6	9356.4	10481.7	11605.4	13284.9	14953.1	16827.4	18677.4	20517.8	22524.2	24719.2	27113.6
Growth (%)	13.3	13.2	5.4	15.4	12.0	12.6	12.5	12.6	12.4	11.1	9.9	9.8	9.7	9.7
Share to Tot. (%)	39.3	30.4	29.5	27.9	25.6	24.1	22.9	22.2	21.7	21.1	20.5	20.0	19.8	19.5
<b>Commercial</b>														
No. of Customers	244481	264257	300366	335450	364169	394988	427444	461667	497761	533511	569255	603573	638043	672250
Customers Elasticity	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Elasticity	1.8	1.8	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Growth of GDP Sec. (%)	9.46	7.01	7.71	7.89	8.02	7.48	7.30	7.14	8.26	8.19	8.10	6.51	6.56	6.58
Power Contr./Cust.(MVA)	5688.9	6037.1	6037.1	5693.0	5693.0	5694.1	5694.1	5694.1	5694.1	5695.2	5695.2	5695.8	5696.0	5696.2
Power Contracted (MVA)	1390.6	1510.2	1755.1	1999.5	2073.2	2243.9	2433.9	2629.0	2834.7	3038.5	3239.4	3434.3	3634.3	3829.3
Consump./Cust.(twb)	7639.7	8318.2	7968.2	8626.8	9370.1	10064.1	10770.4	11510.3	12415.7	13422.8	14536.8	15365.9	16285.8	17295.4
PLN SALES (GWh)	1872.7	2251.0	2436.5	2893.9	3412.3	3976.0	4603.7	5314.0	6180.1	7151.2	8267.9	9274.5	10391.1	11626.8
Growth (%)	17.4	20.2	9.1	17.8	15.4	16.5	15.8	15.4	15.3	15.9	15.5	12.2	12.0	11.9
Share to Tot. (%)	8.36	8.90	7.78	7.49	7.18	6.99	6.83	6.79	6.85	6.92	7.04	7.05	7.12	7.19
<b>Public &amp; Others</b>														
No. of Customers	173556	193096	223148	248626	276296	306692	339450	374781	412871	451417	490183	529191	568479	608098
Customers Elasticity	1.15	1.15	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Elasticity	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3
Power Contr./Cust.(MVA)	7829.5	7789.5	7799.5	7687.9	7651.3	7618.5	7591.3	7566.4	7546.3	7525.8	7510.0	7496.5	7484.8	7474.5
Power Contracted (MVA)	1398.0	1534.9	1724.7	1911.4	2114.1	2316.8	2576.9	2835.7	3114.8	3404.3	3697.1	4001.2	4255.0	4545.3
Consump./Cust.(twb)	1493.8	1686.3	1925.3	2207.5	2493.8	2817.1	3168.8	3517.5	3891.7	4296.7	4747.3	5246.0	5794.4	6387.5
PLN SALES (GWh)	1732.5	2140.5	2597.6	3427.4	4327.4	5381.0	6561.0	7882.6	9322.6	10917.6	12674.6	14594.5	16684.0	18945.2
Growth (%)	7.00	2.29	23.55	37.15	17.19	14.64	15.56	15.20	15.32	15.32	12.44	12.44	12.24	12.04
Share to Tot. (%)	7.56	6.85	7.78	7.49	7.18	6.99	6.83	6.79	6.85	6.92	7.04	7.05	7.12	7.19
<b>Industry</b>														
No. of Customers	27204	27547	36228	42584	47597	53549	60988	69337	77821	85065	93428	102331	112856	124023
Elasticity	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
Growth of GDP Sec. (%)	14.45	14.82	13.76	15.95	11.56	12.76	13.85	13.69	11.37	11.20	11.01	10.85	10.69	10.53
Power Contr./Cust.(MVA)	187215.1	198881.9	224369.0	252511.6	266958.2	248353.3	236432.4	226338.6	218647.1	212452.7	206912.3	201938.2	197287.0	191118.1
Power Contracted (MVA)	5093.0	5478.6	6128.4	6981.3	7937.3	8931.2	10033.0	11269.3	12684.2	14359.5	16351.4	18709.9	22885.1	28151.3
Energy Ind. Demand (GWh)	20546.2	23686.3	26997.2	31733.9	35402.3	39919.6	45448.5	51670.4	57545.3	63345.9	69222.9	76421.5	84180.8	92425.3
Energy Eff. Cust.(GWh)	8324.1	10082.3	12395.7	15090.9	18298.6	22353.3	26968.8	32228.8	38268.8	45092.7	52839.3	61251.1	70440.0	80494.0
Capitve Takeover (GWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Share PLN to Tot. (%)	59.1	57.4	54.8	59.0	68.0	74.7	79.6	82.1	85.7	89.5	92.4	95.2	96.3	97.4
PLN SALES (GWh)	12040.1	13605.8	14801.3	18793.0	24072.0	29282.3	36181.7	42404.3	49335.7	57000.2	64333.5	72744.3	80925.7	90054.9
Growth (%)	25.64	12.99	8.20	26.56	28.50	23.91	21.29	17.20	16.33	14.93	13.46	13.07	11.32	11.21
Share to Tot. (%)	53.7	53.8	53.8	55.9	58.8	60.8	62.3	65.1	65.9	64.2	64.2	64.7	64.3	64.9
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	7930.2	8379.9	10005.1	11175.9	12448.7	13851.6	15347.2	17006.3	18776.8	20572.7	22420.2	24209.6	26033.6	27917.5
Power Contracted (MVA)	12593.6	17482.7	20263.8	23853.1	28353.1	32967.8	38379.2	44030.8	50719.1	58408.9	67210.5	77280.6	88446.1	100846.1
PLN SALES (GWh)	22401.8	25282.6	27508.1	33491.0	40905.3	49038.5	58031.5	67234.6	77650.6	88676.6	100166.8	112467.4	124980.4	138760.5
Growth Rate (%)	19.4	12.9	8.8	21.7	22.1	19.9	18.3	15.9	14.2	14.2	13.0	12.3	11.1	11.0
T & D Losses (%)	15.2	14.9	14.5	14.0	13.5	13.0	12.5	12.0	11.5	10.9	10.0	9.7	9.4	9.4
Energy Sent Out (GWh)	26660.6	29979.7	32463.2	39278.8	47681.4	56815.3	66821.7	76955.7	88345.6	100293.1	112621.3	125706.2	139193.5	153999.1
Plant Use (%)	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Load Factor (%)	28047.8	31524.4	34171.8	41347.2	50190.9	59803.4	70220.1	81006.0	92929.3	105599.5	118608.7	132380.8	146519.5	162104.3
Peak Load (MW)	4565.4	4728.0	5645.3	6821.1	8267.3	9837.0	11590.2	13286.3	15187.3	16824.6	18681.2	21038.5	23238.8	25701.4

\* Actual # Estimated (1991/92)  
+ Losses to production

MODERATE SCENARIO : FORECAST: MEDIUM, PRIVATE'S PROJECTS DATES: MODERATE

Demand - Supply	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<b>Demand</b>													
1. Sales	25283	27508	33024	39872	44346	49623	55491	61384	67434	73999	80875	87860	95628
Increase (%)	8.8	20.1	11.8	11.9	11.8	11.9	11.8	10.6	9.9	9.7	9.0	8.9	8.8
2. Losses T & D	4697	4955	5708	6572	7032	7502	8023	8459	8854	9243	9536	9992	10502
Increase (%)	14.9	14.5	14.0	13.5	13.0	12.5	12.0	11.5	11.0	10.5	10.0	9.7	9.4
3. Sent Out Energy	29980	32463	38732	46243	51378	57125	63514	69839	76242	82741	89211	97351	106130
Increase (%)	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4. Station Use	31524	34172	40771	48577	54082	60131	66887	73515	80303	87623	94959	103001	111716
Gross Generation (MWh)	4728	5645	6746	8018	8956	9877	10966	12006	13174	14399	15621	16964	18423
6. System Peak (%)	76.1	69.1	69.3	69.4	69.4	69.5	69.6	69.9	69.9	69.5	69.4	69.3	69.2
<b>Supply</b>													
- Existing Capacity	6357	6357	6357	6357	5931	5931	5904	5609	5609	5609	5609	5609	5409
<b>On Going Projects</b>													
Kedungombo, HEPP		23	23	23	23	23	23	23	23	23	23	23	23
Tulungagung, HEPP			36	36	36	36	36	36	36	36	36	36	36
Pailon #1, #2, STCPP		60	60	60	60	60	60	60	60	60	60	60	60
Ex Tosan Prima, GTPP		6	6	6	6	6	6	6	6	6	6	6	6
Senayan, DIEPP		6	6	6	6	6	6	6	6	6	6	6	6
Gresik #1, #2, #3, CCGP		1080	1412	1578	1578	1578	1578	1578	1578	1578	1578	1578	1578
Sub Total	66	1169	1937	2503	2503	2503	2503	2503	2503	2503	2503	2503	2503
<b>Committed Projects</b>													
Salak #1, #2, GEOPP			110	110	110	110	110	110	110	110	110	110	110
Muara Karang, CCGP		324	514	514	514	514	514	514	514	514	514	514	514
Priok #1, #2, CCGP			780	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Tambak Lorok, CCGP			324	514	514	514	514	514	514	514	514	514	514
Bali, GTPP		80	80	80	80	80	80	80	80	80	80	80	80
Tulis, HEPP			13	13	13	13	13	13	13	13	13	13	13
Citra satge II, HEPP							800	800	800	800	800	800	800
Ciliman, HEPP			10	10	10	10	10	10	10	10	10	10	10
Kesamban, HEPP				33	33	33	33	33	33	33	33	33	33
Drajat #1, GEOPP				55	55	55	55	55	55	55	55	55	55
Dieng, GEOPP				55	55	55	55	55	55	55	55	55	55
Suralaya #5, #6, #7, STCPP				55	55	55	55	55	55	55	55	55	55
Sub Total	384	1811	2531	2504	2504	3784	4884	4884	4884	4884	4884	4884	4884
<b>Planned Projects</b>													
PLN's Projects													
Jatipede, HEPP													
Cimandiri, HEPP													
Ayung, HEPP													
East Java, CCGP					500	500	500	500	500	500	500	500	500
Pailon #3-#4													
West Java I #3-#5, STCPP													
Central Java #5-#7, STCPP													
Java, GTPP													
Sub Total					500	500	500	544	1070	1070	2430	1440	4230
<b>Private's Projects</b>													
Pailon #7, #8, STCPP						600	1200	1200	1200	1200	1200	1200	1200
Pailon #5, #6, STCPP													
Central Java #1-#4, STCPP													
Cilegon, STCPP													
West Java I #1, #2, STCPP													
Patuha, GEOPP													
Wayang Windu, GEOPP													
Sub Total						600	1200	2400	3600	4800	4800	5200	8400
<b>Total Installed Capacity</b>	6423	7910	10105	11391	11498	13298	14971	15920	17848	18848	20206	21888	23406
LOLP				0.001	0.755	0.318	0.238	0.039	0.235	0.685	0.572	0.957	0.843

dlp/psw/ade

Energy & Load Demand Forecast  
 JAVA & BALI SYSTEM (MODERATE)

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population(10 <sup>3</sup> )	110351.6	112166.3	113998.8	115855.1	117707.9	119592.1	121422.4	123251.1	125097.0	126952.9	128852.2	130765.5	132470.3	134262.8
Growth Rate(%)	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4
Electr. Rate(%)	34.0	36.1	40.8	43.4	46.0	48.8	51.7	54.8	58.0	61.2	64.5	67.9	71.3	74.8
No. of Customers(10 <sup>3</sup> )	3790.0	8093.0	9708.2	10050.3	10834.7	11687.9	12552.7	13497.3	14501.4	15545.2	16624.7	17740.1	18891.6	20086.6
Power Contracted(MVA)	4712.0	5099.0	5874.4	6319.8	6790.3	7290.3	7821.1	8371.9	8940.4	9616.6	10264.3	10933.6	11635.7	12341.5
Growth of GDP Total(%)	4.9	7.5	7.4	7.4	7.4	7.4	7.5	7.5	7.5	7.4	7.4	6.7	6.7	6.7
Consump./Cust.(kwh)	906.0	950.9	871.2	915.6	941.6	970.0	1001.8	1035.7	1075.8	1109.8	1151.2	1183.7	1219.5	1258.4
PLN SALES(GWh)	6795.3	7695.1	8109.6	9202.4	10201.4	11318.1	12574.7	13978.6	15538.1	17251.9	19157.9	20996.9	23040.3	25274.2
Growth (%)	13.3	13.2	5.4	13.5	10.9	10.9	11.1	11.2	11.2	11.0	10.9	9.7	9.7	9.7
Share to Tot.(%)	30.3	30.4	29.3	27.9	25.7	25.3	25.3	25.2	25.3	25.6	25.9	26.0	26.2	26.4
<b>Commercial</b>														
No. of Customers	24481	264257	300366	326608	345703	365323	386187	407853	430473	453172	477053	500915	525197	549920
Customers Elasticity	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Elasticity	1.5	1.6	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.4
Growth of GDP Sec.(%)	9.46	6.92	7.21	6.98	7.51	7.04	6.60	6.52	7.60	7.53	7.46	5.87	5.93	5.96
Power Contr. Cust.(VA)	5688.0	5488.9	5690.5	5692.2	5692.6	5693.0	5693.4	5693.8	5694.1	5694.4	5694.7	5694.9	5695.2	5695.4
Power Contracted(MVA)	1398.6	1610.2	1755.1	1859.6	1968.0	2080.9	2198.7	2322.2	2451.2	2582.8	2716.7	2852.7	2991.1	3132.0
Consump./Cust.(kwh)	7637.7	8318.2	7968.2	8634.9	9209.3	9698.4	10154.6	10622.5	11216.4	11850.7	12485.5	13243.6	13932.0	14646.7
PLN SALES(GWh)	1872.7	2291.0	2456.3	2821.0	3183.7	3545.0	3921.6	4321.8	4821.8	5366.1	5956.3	6631.6	6949.4	7504.6
Growth (%)	17.4	20.2	9.1	14.0	12.9	11.3	10.6	10.5	11.4	11.2	10.9	8.0	8.0	8.0
Share to Tot.(%)	8.36	8.90	8.93	8.34	8.03	7.99	7.90	7.81	7.86	7.96	8.05	7.97	7.91	7.85
<b>Public &amp; Others</b>														
No. of Customers	176556	195096	223148	240393	258371	277842	298281	320013	343085	365016	391716	417185	443475	470612
Customers Elasticity	1.15	1.15	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Elasticity	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3
Power Contr. Cust.(VA)	7829.5	7784.9	7729.1	7700.2	7674.0	7649.9	7627.8	7607.4	7588.5	7571.5	7556.0	7542.1	7529.3	7517.6
Power Contracted(MVA)	1398.6	1610.2	1755.1	1859.6	1968.0	2080.9	2198.7	2322.2	2451.2	2582.8	2716.7	2852.7	2991.1	3132.0
Consump./Cust.(kwh)	9488.9	8880.2	9592.3	10149.4	10616.3	10916.7	11247.3	11654.2	12183.2	12801.8	13483.2	14230.2	15059.5	15987.8
PLN SALES(GWh)	1693.8	1732.5	2140.5	2493.8	2716.6	3005.3	3295.0	3698.0	4092.2	4491.8	4831.9	5201.7	5593.5	6022.6
Growth (%)	7.90	2.29	23.33	13.99	11.34	10.43	9.64	9.50	10.93	9.98	9.77	7.65	7.63	7.58
Share to Tot.(%)	7.56	6.83	7.78	7.39	6.83	6.78	6.64	6.50	6.52	6.53	6.53	6.45	6.37	6.30
<b>Industry</b>														
No. of Customers	27204	27547	36228	42198	46856	52517	59168	66346	73421	80315	87413	95283	103674	112705
Elasticity	1.2	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9
Growth of GDP Sec.(%)	14.45	14.72	13.23	14.98	15.04	12.08	13.11	13.02	13.69	10.52	10.33	10.19	10.04	9.89
Power Contr. Cust.(VA)	187235.3	198495.9	224365.0	239418.9	262728.5	290684.4	329480.1	372922.8	422301.7	478315.1	54574.6	625943.7	718906.6	829450.3
Power Contracted(MVA)	3091.0	5478.6	8128.4	9848.7	12101.5	13165.2	14169.5	15289.7	17381.6	18451.6	19522.9	20890.0	22553.6	24523.6
Energy Ind. Demand(GWh)	20566.2	23665.9	26997.2	31445.8	36917.4	43935.5	51092.1	59826.1	70133.5	82146.7	95146.7	11004.9	12723.2	14687.8
Energy Big Cust.(GWh)	0.0	0.0	3315.0	1848.9	3677.8	101.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capit. Power(GWh)	8324.1	10660.1	12195.7	12884.9	11347.7	12657.1	14260.2	16448.0	17695.3	19318.3	21067.7	22964.3	24986.7	27163.1
Capit. Takeover(GWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Share PLN to Tot.(%)	59.1	57.5	54.8	59.0	67.5	67.7	67.7	67.7	67.7	67.7	67.7	67.7	67.7	67.7
PLN SALES(GWh)	12040.1	13403.8	14001.5	15609.9	23569.8	26478.4	29831.9	33372.1	37038.2	40413.5	44073.0	49040.7	53271.5	58024.4
Growth (%)	23.64	12.99	8.40	25.40	26.99	12.34	12.47	12.54	10.26	9.17	9.06	9.00	8.81	8.71
Share to Tot.(%)	53.7	53.8	53.8	56.2	59.4	59.7	60.1	60.5	60.3	59.9	59.6	59.5	59.3	59.4
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	7950.2	8379.9	9875.9	10659.8	11485.8	12363.8	13296.3	14291.8	15348.4	16445.9	17588.9	18753.5	19965.9	21219.8
Power Contracted(MVA)	12593.6	13722.7	17482.6	19880.2	23053.0	24661.8	26464.5	28343.3	30366.8	32316.9	34375.4	36535.5	38845.8	41264.9
PLN SALES(GWh)	22401.8	25282.6	27508.1	31024.1	34967.3	43466.8	49623.2	55493.1	61384.2	67493.9	73999.2	80674.8	87859.7	94628.0
Growth Rate(%)	19.4	12.9	8.8	20.1	20.1	11.8	11.9	11.8	10.6	9.9	9.7	9.0	8.9	8.8
T. & D. Loss(%)	15.2	14.9	14.5	14.0	13.5	13.0	12.5	12.0	11.5	11.0	10.5	10.0	9.7	9.4
Energy Sent Out(GWh)	26660.6	29979.7	32463.2	38722.2	46243.1	51377.7	57139.9	63114.3	69838.8	76267.6	83060.0	90171.1	97851.3	106128.8
Plant Use (%)	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Production(GWh)	28047.8	31524.4	34171.8	40770.8	48677.0	54081.8	60131.4	66857.1	73944.5	80302.9	87623.3	94959.0	103001.4	111715.6
Load Factor (%)	70.1	76.1	69.1	69.3	69.3	69.4	69.1	69.6	69.9	69.6	69.3	69.4	69.3	69.2
Peak Load(MW)	4585.4	4728.0	5645.3	6746.3	8018.4	8895.8	9876.7	10965.8	12005.8	13174.0	14398.6	15620.7	16964.1	18422.7

\* Actual # Estimated (1991/1992)  
 +) Losses to production

**Generation Expansion Program of Outside Java  
[excluding Bali and Batam Island]**

**Scenario 90 D, R**

Description	Unit	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Demand</b>														
1. Sales	(GWh)	5840	6956	8287	9560	11226	12773	14455	16322	18410	20753	23390	26360	29722
2. Gross Generation	(GWh)	7420	8748	10443	11986	13991	15836	17826	20024	22467	25195	28248	31668	35526
3. System Peak	(MW)	1508	1748	2089	2372	2728	3066	3432	3835	4282	4778	5332	5949	6642
4. System LF	(%)	56	57	57	58	59	59	59	60	60	60	60	61	61
<b>Supply</b>	(MW)													
<b>Existing</b>		2756	2691	2673	2646	2636	2532	2409	2257	2195	2170	2080	1958	1761
<b>Ongoing Projects</b>														
Belawan, CCGP Block I (GTPP #2 & ST)		-	140	260	260	260	260	260	260	260	260	260	260	260
Padang, GTPP		-	30	60	60	60	60	60	60	60	60	60	60	60
Kotopanjang # 1-3		-	-	-	-	-	-	114	114	114	114	114	114	114
Singkarak # 1-4		-	-	-	-	-	-	-	175	175	175	175	175	175
B. Asam #3, HEPP		-	-	-	65	65	65	65	65	65	65	65	65	65
Lahendong, GEPP		-	3	3	3	3	3	3	3	3	3	3	3	3
Scattered Diesel PP		10	79	125	125	125	125	125	125	125	125	125	125	125
Sub-total		10	252	447	512	512	512	626	801	801	801	801	801	801
<b>Committed Projects</b>														
Belawan, CCGP Block II		-	-	-	-	400	400	400	400	400	400	400	400	400
Renun, HEPP		-	-	-	-	-	82	82	82	82	82	82	82	82
Ombilin # 1-2, STCFPP		-	-	-	-	200	200	200	200	200	200	200	200	200
B. Asam #4, HEPP		-	-	-	-	65	65	65	65	65	65	65	65	65
Banjarmasin, OPP		-	-	24	24	24	24	24	24	24	24	24	24	24
Lahendong, GEPP		-	-	20	20	20	20	20	20	20	20	20	20	20
Ulumbu, GEPP		-	-	-	-	3	3	3	3	3	3	3	3	3
Sub-total		-	-	44	44	712	794	794	794	794	794	794	794	794
<b>Planned Projects</b>														
Peusangan I & II, HEPP		-	-	-	-	-	-	60	60	60	60	60	60	60
Peusangan IV, HEPP		-	-	-	-	-	-	-	30	30	30	30	30	30
Tampur stage, HEPP		-	-	-	-	-	-	-	-	-	-	428	428	428
Lawe Alas		-	-	-	-	-	-	-	-	-	-	-	-	322
Sipansihaporas, HEPP		-	-	-	-	-	-	-	50	50	50	50	50	50
Wampu, HEPP		-	-	-	-	-	-	-	-	172	172	172	172	172
Asahan III, HEPP		-	-	-	-	-	-	-	400	400	400	400	400	400
Toru, HEPP		-	-	-	-	-	-	-	-	-	-	125	125	125
Medan #1-4, GTPP		-	-	-	-	50	100	100	100	100	100	100	200	200
Kerinci, GEOPP		-	-	-	-	2	2	2	2	2	2	2	2	2
Besai		-	-	-	-	-	80	90	90	90	90	90	90	90
Musti		-	-	-	-	-	-	-	-	210	210	210	210	210
Merangin		-	-	-	-	-	-	-	-	339	339	339	339	339
Ketaun		-	-	-	-	-	-	-	-	-	-	-	84	84
Batuteqi, HEPP		-	-	-	-	-	-	-	-	24	24	24	24	24
Palemban, GTPP		-	-	-	60	60	60	60	60	60	60	60	60	60
Tarahan #1-2		-	-	-	-	-	-	-	65	130	130	130	130	130
Import from Java		-	-	-	-	100	100	100	100	100	100	100	100	100
Pade, Kembayung		-	-	-	-	-	-	-	-	-	-	30	30	30
Pontianak #5		-	-	-	-	-	-	-	-	-	-	-	25	25
Kusan		-	-	-	-	-	-	-	-	68	68	68	68	68
B.masin #1-7, STCFPP		-	-	-	-	-	90	90	135	135	180	225	315	315
Samarinda, GTPP		-	-	-	-	-	-	-	-	30	30	30	30	30
Samarinda #1-4, CCGP		-	-	66	66	99	99	99	99	132	132	132	132	132
Tanggai II, HEPP		-	-	-	19	19	19	19	19	19	19	19	19	19
Palu III, HEPP		-	-	-	-	-	-	-	-	-	-	-	-	76
Poigar II, HEPP		-	-	-	-	-	-	-	-	16	16	16	16	16
Poigar III, HEPP		-	-	-	-	-	-	-	-	13	13	13	13	13
Bitung #1-4, GTPP		-	-	-	-	-	-	-	50	75	75	75	100	100
Bakaru II, HEPP		-	-	-	-	-	-	-	126	126	126	126	126	126
Malea, HEPP		-	-	-	-	-	-	-	-	-	-	184	184	184
Bili-Bili, HEPP		-	-	-	-	-	-	-	-	16	16	16	16	16
U.Pandang, GTPP		-	-	-	30	60	60	60	60	60	60	60	60	60
U.Pandang # 1-2, STCFPP		-	-	-	-	-	-	65	130	130	130	130	130	130
Isal-2, HEPP		-	-	-	-	-	-	-	-	-	20	20	20	40
Ambon, GTPP		-	-	-	-	-	-	-	-	20	20	20	20	20
Sentani #1-2		-	-	-	-	-	12	12	12	12	12	12	12	12
Beburung, HEPP		-	-	-	-	-	-	22	22	22	22	22	22	22
Iralalato, HEPP		-	-	-	-	-	-	-	-	27	27	27	27	27
Hu'u #1-2, GEOPP		-	-	-	-	-	-	-	-	10	10	10	10	10
Mutubusa #1-2, GEOPP		-	-	-	-	-	-	-	-	8	8	8	8	8
Scattered Diesel PP		-	100	146	273	298	379	442	478	524	539	570	589	611
Mini Hydro		-	-	1	20	20	34	46	55	59	59	59	59	59
Sub-total		-	100	301	556	2132	2633	2856	3732	4657	4891	5734	6032	6562
<b>Private's Projects</b>														
Sarulla #1-2, GEOPP		-	-	-	-	-	55	110	110	110	110	110	110	110
Sibayak #1,2, GEOPP		-	-	-	-	-	-	-	110	110	110	110	110	110
Pontianak #1-4		-	-	-	-	-	-	50	75	100	100	100	100	100
Sub-total		-	-	-	-	-	55	160	295	320	320	320	320	320
<b>Total</b>	(MW)	2766	3043	3465	3758	5993	6525	6845	7879	8768	8977	9710	9904	10236

09/mst/cap-1j



Energy & Load Demand Forecast  
TOTAL OUTTAVA ( EXCLUDING BALI ) ( HIGH )

DKL 2.0

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>3</sup> )	48970.1	70648.5	72353.5	74062.1	75751.3	77397.7	79069.9	80771.8	82441.3	84088.8	85702.8	87279.2	88790.2	90298.6
Growth Rate (%)	2.4	2.4	2.4	2.4	2.3	2.2	2.1	2.1	2.0	1.9	1.9	1.8	1.7	1.7
Elect. Ratio (%)	23.4	25.3	28.4	31.3	34.2	37.2	40.2	43.3	46.5	49.7	52.9	56.2	59.5	62.9
No. of Customers (10 <sup>3</sup> )	3227.9	3577.4	4114.6	4637.4	5184.2	5785.8	6362.8	6957.7	7665.5	8355.9	9088.1	9888.1	10772.2	11543.5
Power Contr./Cust.(VA)	404.0	592.9	603.3	603.3	603.3	603.3	603.3	603.3	603.3	603.3	603.3	603.3	603.3	603.3
Power Contracted (MVA)	1949.5	2121.1	2482.3	2797.6	3127.5	3474.2	3838.9	4222.3	4625.7	5042.8	5474.2	5920.6	6382.5	6861.0
Growth of GDP Total (%)	6.07	5.22	5.48	5.90	5.46	5.88	5.88	5.84	5.85	5.80	5.77	6.11	6.09	6.95
Consump./Cust.(kwh)	483.2	495.5	636.1	621.7	612.9	689.2	688.3	619.8	612.7	618.7	627.4	637.5	638.8	644.5
Energy Consump.(GWh)	2205.2	2488.0	2617.3	2883.3	3177.2	3508.0	3870.3	4268.5	4696.9	5169.5	5686.7	6232.9	6817.3	7550.5
Growth (%)	13.2	12.8	5.2	10.2	10.2	10.4	10.3	10.3	10.0	10.1	10.0	9.9	9.9	9.9
Share to Total (%)	41.3	42.6	37.6	34.8	33.2	31.2	30.3	29.5	28.8	28.1	27.4	26.7	26.1	25.4
<b>Commercial</b>														
No. of Customers	162198	174366	224886	253416	283371	314343	347008	381240	417139	454200	492473	532019	572895	615179
Customers Ratio to Res.	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Elasticity	1.1	1.2	1.0	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8
Growth of Gdp Sec (%)	12.08	11.75	11.03	12.47	10.25	10.82	11.39	11.31	10.49	10.38	10.28	9.42	9.56	9.45
Power Contr./Cust.(VA)	2403	2799	2294	2289	2285	2282	2280	2279	2278	2278	2277	2277	2278	2278
Power Contracted (MVA)	402.8	488.0	515.9	590.0	647.0	717.4	791.2	868.8	950.3	1034.5	1121.6	1211.7	1304.9	1401.5
Consump./Cust.(kwh)	2801.0	3099.7	2576.3	2603.1	2642.4	2678.1	2722.7	2776.8	2838.2	2899.2	2990.3	3079.7	3177.3	3283.0
Energy Consump.(GWh)	454.3	531.8	579.4	659.7	748.3	841.8	944.8	1038.6	1183.9	1321.4	1472.8	1638.5	1820.2	2019.6
Growth (%)	8.5	17.1	6.9	13.9	13.4	12.5	12.2	12.0	11.8	11.6	11.5	11.3	11.1	11.0
Share to Total (%)	5.5	9.1	8.3	8.0	7.8	7.5	7.4	7.3	7.3	7.2	7.1	7.0	6.9	6.8
<b>Public &amp; Others</b>														
No. of Customers	102649	110897	134876	152111	170105	188976	208772	229537	251336	273842	297087	321107	345938	371627
Customers Ratio to Res.	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Elasticity	0.3	0.3	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Power Contr./Cust.(VA)	3040	3635	4015	4024	4032	4040	4048	4055	4063	4070	4078	4086	4093	4101
Power Contracted (MVA)	5346.6	5300.4	541.5	612.0	685.8	763.4	845.0	938.5	1021.1	1114.6	1211.9	1311.9	1416.0	1524.0
Consump./Cust.(kwh)	348.8	587.8	483.9	504.9	504.2	507.4	504.9	507.4	511.4	517.4	523.1	528.9	534.8	541.8
Energy Consump.(GWh)	87.7	71.1	164.4	262.2	357.7	437.7	515.3	604.3	728.7	846.1	1001.9	1179.3	1373.9	1621.1
Growth (%)	10.3	10.1	9.4	9.3	9.0	8.5	8.3	8.1	7.9	7.7	7.5	7.3	7.1	6.9
<b>Industry</b>														
No. of Customers	8918	9476	10991	12213	13628	15169	16891	18849	21041	23211	26293	29434	32983	36990
Elasticity	0.9	0.4	0.9	0.6	0.8	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9
Growth of Gdp Sec (%)	16.43	15.55	14.75	17.81	12.83	14.11	15.27	15.15	12.86	12.72	12.56	12.43	12.29	12.15
Power Contr./Cust.(VA)	113008	118163	124015	129790	125455	128156	124364	121098	118314	116002	114123	112640	111519	124864
Power Contracted (MVA)	10978	1119.7	1343.1	1585.3	1709.7	1944.0	2191.9	2282.6	2489.5	2727.3	3000.8	3315.7	3678.2	4618.7
Energy In. Demand (GWh)	8102.8	8546.4	9648.7	10648.2	11769.2	12882.5	14336.3	15848.2	17338.2	19428.9	21546.0	23918.7	26580.0	29507.5
Energy Big Cust.(GWh)	5972.3	6207.5	6572.8	6717.7	6927.7	7088.7	7432.6	7885.9	8383.1	8926.4	9509.3	10129.5	10786.2	11467.8
Capitive Tattover (GWh)	0.0	0.0	0.0	3.91	331.7	418.9	289.6	246.5	249.7	239.2	271.3	285.5	323.3	367.7
Share PLN to Tot. (%)	26.3	26.1	31.9	37.3	40.6	45.6	48.2	50.2	52.2	54.1	55.9	57.7	59.4	61.2
Energy Consump.(GWh)	2190.5	2332.2	3073.7	3976.3	4776.4	5923.8	6903.8	7962.3	9155.1	10502.5	12036.3	13789.2	15793.8	18099.7
Growth (%)	16.1	4.8	37.8	29.3	20.1	24.0	16.5	15.3	15.0	14.7	14.6	14.6	14.5	14.6
Share to Total (%)	39.9	38.2	44.2	48.0	50.0	52.8	54.0	55.1	56.1	57.0	58.0	59.0	59.9	60.9
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	3501.7	3872.1	4485.4	5051.2	5631.3	6277.3	6935.4	7627.3	8355.1	9107.5	9885.6	10690.7	11524.0	12387.3
Power Contracted (MVA)	3764.5	4132.1	4922.7	5574.9	6176.9	6899.1	7577.0	8394.4	9086.6	9913.3	10808.1	11759.8	12781.6	14405.3
Energy Consump.(GWh)	5338.8	5839.8	6936.4	8268.6	9339.6	11225.6	12773.3	14434.6	16321.7	18409.5	20752.7	23389.9	26360.2	29721.9
Growth Rate (%)	14.2	9.4	19.1	19.1	15.4	17.4	13.8	13.2	12.9	12.8	12.7	12.7	12.7	12.8
T & D Losses (%)	17.7	17.4	16.5	16.6	16.2	15.8	15.4	14.9	14.5	14.1	13.7	13.2	12.8	12.4
Energy Sent Out (GWh)	6545.1	7127.3	8395.7	10023.5	11503.6	13434.4	15207.0	17117.8	19227.5	21573.8	24192.9	27124.7	30409.2	34113.7
Plant Use (%)	3.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Production (GWh)	6820.2	7420.3	8747.5	10442.8	11982.8	13990.9	15836.4	17826.6	20023.6	22467.3	25194.9	28248.1	31668.4	35525.9
Load Factor (%)	54.4	56.2	57.1	57.1	57.1	58.6	59.0	59.3	59.6	60.2	60.2	60.2	60.8	61.1
Peak Load (MW)	1332.7	1308.1	1747.6	2088.8	2371.6	2727.5	3063.8	3431.9	3834.6	4281.6	4778.2	5331.8	5949.2	6642.3

DEI.D/wh/655

MEI 1992

\* Actual # Estimated

Energy & Load Demand Forecast  
TOTAL OUTJAYA + DATAM (EXCLUDING BALI) (HIGH)

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population(10 <sup>3</sup> )	68970.1	70648.5	72353.5	74022.1	75731.3	77397.7	79069.0	80771.8	82461.3	84088.8	85702.8	87279.2	88799.2	90298.6
Growth Rate(%)	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.1	2.1	2.0	1.9	1.8	1.7	1.7
Electr. Ratio(%)	23.4	25.3	28.6	31.5	34.4	37.4	40.5	43.6	46.8	50.0	53.2	56.3	59.8	63.2
No. of Customers(10 <sup>3</sup> )	3277.9	4141.7	4667.5	5217.2	5794.8	6401.7	7039.4	7709.0	8403.1	9119.4	9860.3	10626.7	11426.7	12261.7
Power Contr./Cust.(VA)	604.0	592.9	611.1	610.9	610.3	610.6	610.5	610.5	610.2	609.8	609.8	609.8	609.7	609.7
Power Contracted(MVA)	1949.5	2121.1	2530.9	2851.6	3186.8	3598.8	4297.3	4705.7	5127.6	5563.6	6014.3	6480.4	6962.8	7462.8
Growth of GDP Total (%)	8.07	5.22	5.48	5.90	5.46	5.68	5.88	5.84	5.85	5.80	5.77	5.77	5.77	5.77
Consump./Cust.(kwh)	683.2	695.3	645.2	631.1	622.3	618.6	617.8	619.4	622.1	627.9	636.1	646.7	659.3	673.7
Energy Consump.(GWh)	2205.2	2488.0	2672.4	2945.5	3246.7	3584.9	3954.9	4360.4	4796.5	5276.5	5801.2	6376.9	7005.8	7693.7
Growth (%)	13.2	12.8	7.4	10.2	10.2	10.4	10.3	10.3	10.0	10.0	9.9	9.9	9.9	9.8
Share to Total (%)	41.2	42.5	36.0	33.4	31.9	30.1	29.2	28.4	27.7	27.1	26.4	25.8	25.2	24.6
<b>Commercial</b>														
No. of Customers	162198	174386	235091	264511	295145	327170	360666	395695	432357	470149	509151	549309	590793	633651
Customer Ratio to Res.	0.03	0.03	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Elasticity	1.1	1.2	1.0	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
Growth of Gdp Sec.(%)	12.08	11.15	11.08	12.47	10.23	10.82	11.39	11.31	10.49	10.38	10.28	9.56	9.45	9.45
Power Contr./Cust.(VA)	2483	2799	2447	2436	2428	2420	2414	2408	2402	2397	2393	2389	2385	2381
Power Contracted(MVA)	402.8	488.0	575.2	644.4	718.6	791.8	870.5	952.7	1038.6	1127.1	1218.1	1312.0	1408.8	1508.7
Consump./Cust.(kwh)	2801.0	3049.7	2855.5	2916.5	2958.6	2995.8	3040.5	3093.1	3152.1	3218.9	3287.2	3368.5	3487.3	3593.4
Energy Consump.(GWh)	454.3	531.8	678.4	771.4	873.2	980.1	1096.6	1223.9	1362.9	1513.8	1678.6	1861.3	2060.3	2271.1
Growth (%)	17.4	17.1	27.6	13.7	13.2	12.2	11.9	11.6	11.4	11.1	10.9	10.9	10.7	10.5
Share to Total (%)	8.5	9.1	9.1	8.8	8.6	8.2	8.1	8.0	7.9	7.8	7.7	7.5	7.4	7.3
<b>Public &amp; Others</b>														
No. of Customers	102649	110897	135915	152583	170609	189512	209338	230132	251937	274490	297759	321802	346654	372363
Customer Ratio to Res.	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Elasticity	1.5	0.3	0.9	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6
Power Contr./Cust.(VA)	3940	3635	4019	4027	4035	4043	4051	4056	4065	4073	4080	4088	4095	4103
Power Contracted(MVA)	494.3	463.2	543.8	532.3	535.3	538.7	542.9	547.8	552.6	557.8	563.5	569.5	576.2	582.8
Consump./Cust.(kwh)	3476.9	3442.2	3417.7	3372.3	3331.1	3285.2	3239.5	3194.0	3148.6	3103.2	3057.8	3012.4	2967.0	2921.6
Energy Consump.(GWh)	562.2	603.7	733.1	819.7	913.2	1010.3	1115.5	1229.2	1352.3	1485.3	1628.5	1783.7	1951.2	2132.2
Growth (%)	23.5	7.4	21.4	11.8	11.4	10.4	10.4	10.2	10.0	9.8	9.5	9.3	9.4	9.3
Share to Total (%)	10.5	10.3	9.9	9.3	9.0	8.3	8.2	8.0	7.8	7.6	7.4	7.2	7.0	6.8
<b>Industry</b>														
No. of Customers	8918	9476	11028	12338	13679	15229	16972	18891	21134	23455	26409	29362	33131	37143
Customer Ratio to Res.	0.9	0.4	1.1	0.6	0.8	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9
Elasticity of Gdp Sec.(%)	16.43	15.33	14.73	17.91	12.83	14.11	15.21	15.33	12.72	12.72	12.54	12.43	12.29	12.13
Power Contr./Cust.(VA)	113098	118163	134936	141364	157789	171133	186121	193370	191003	190573	184463	176738	165865	150399
Power Contracted(MVA)	1607.8	1119.7	1488.0	1732.8	1883.7	2149.4	2344.2	2582.7	2813.3	3085.5	3392.5	3746.6	4152.3	4540.2
Energy Ind. Demand(GWh)	8102.8	8346.4	9903.2	10948.6	12123.6	13400.8	14829.9	16418.8	18197.8	20154.4	22344.1	24796.4	27545.4	30629.7
Energy Big Cust.(GWh)	6.0	6.0	296.2	277.3	6.0	210.2	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Capitve Power (GWh)	5972.3	6207.3	6572.9	6671.7	6992.7	7058.7	7432.6	7885.9	8383.1	8925.4	9509.8	10129.5	10786.2	11467.8
Share PLN to Total (%)	26.3	26.1	33.6	39.1	42.3	41.8	28.6	24.6	24.7	25.2	27.1	29.5	32.3	35.7
Energy Consump.(GWh)	2130.5	2252.2	3330.3	4276.9	5120.9	6462.1	7397.3	8532.9	9814.7	11228.0	12834.3	14667.1	16739.4	19161.9
Growth (%)	16.1	4.8	49.2	28.4	28.0	23.6	16.6	15.4	14.4	14.4	14.3	14.3	14.3	14.2
Share to Total (%)	39.8	38.1	44.9	48.5	50.5	53.2	54.3	55.4	56.6	57.6	58.5	59.4	60.3	61.3
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	3501.7	3672.1	4323.2	5096.8	5664.7	6267.7	6988.6	7684.2	8415.5	9171.3	9952.7	10761.0	11597.2	12463.3
Power Contracted(MVA)	3352.2	3853.8	4667.5	5217.2	5794.8	6401.7	7039.4	7709.0	8403.1	9119.4	9860.3	10626.7	11426.7	12261.7
Energy Consump.(GWh)	15.7	17.2	16.4	18.9	15.3	17.3	13.8	13.1	12.9	12.6	12.5	12.5	12.5	12.6
T & D Losses(%)	17.5	17.2	16.4	16.5	16.1	15.7	15.3	15.0	14.4	14.4	14.4	14.4	14.4	14.4
Energy Sent Out(GWh)	6545.1	7128.8	8392.8	10666.5	12217.2	14264.8	16129.2	18157.6	20347.6	22831.3	25554.0	28603.7	32054.0	35854.0
Plant Use (%)	4.0	3.9	4.0	4.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Production (GWh)	6820.2	7421.9	9308.5	11085.1	12719.2	14826.4	16787.1	18893.5	21219.2	23763.6	26598.1	29772.9	33232.1	37320.0
Load Factor (%)	38.4	34.9	37.5	37.4	36.0	38.3	39.2	39.6	39.5	40.2	40.4	40.7	41.0	41.2
Peak Load (MW)	1323.7	1546.5	1848.5	2204.0	2592.8	3074.3	3634.4	4262.3	4945.1	5699.2	6491.2	7329.1	8229.1	9166.2

\* Actual & Estimated

APRIL 1992

PHI, Divisi/655

Potential Energy and Peak Forecast  
Load Centre : BATAM ISLANDS

Fiscal Year	1992*	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>												
Population	13558	15034	165217	179921	194495	208693	222467	235814	248548	260727	272199	283087
Growth Rate (%)	12.0	10.9	9.9	8.9	8.1	7.3	6.8	6.0	5.4	4.9	4.4	4.0
Electrification Ratio (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of Customers	27112	30057	33043	35984	38899	41739	44493	47163	49710	52145	54440	56617
Power Contracted/Cust. (VA)	1796.1	1796.5	1796.8	1797.1	1797.3	1797.5	1797.8	1797.9	1798.0	1798.1	1798.2	1798.2
Power Contracted (KVA)	48696.3	54015.5	59373.4	64667.0	69913.5	75024.8	79983.3	84788.6	89372.9	93757.2	97887.2	101808.8
Consump./Cust. (KWh)	2030.7	2068.1	2103.4	2137.6	2170.9	2203.9	2236.8	2270.0	2303.6	2377.3	2452.5	2529.4
Energy Consump. (MWh)	55056	62181	69505	76919	84445	91986	99524	107057	114513	123365	133512	143208
Growth Rate (%)	673.0	12.9	11.8	10.7	9.8	8.9	8.2	7.6	7.0	6.3	5.7	5.3
<b>Commercial</b>												
No. of Customers	10205	11095	11974	12826	13658	14455	15218	15949	16638	17290	17899	18471
Customer Elasticity	0.67	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Constituent Ratio	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Power Contracted/Cust. (VA)	5808.1	5807.4	5806.9	5806.4	5806.0	5805.7	5805.4	5805.2	5805.0	5804.8	5804.6	5804.5
Power Contracted (KVA)	59272.7	64434.0	69530.7	74475.4	79296.1	83922.1	88349.9	92595.6	96581.8	100364.6	103894.5	107216.5
Consump./Cust. (KWh)	9699	10075	10436	10781	11116	11440	11757	12068	12374	12690	13410	13938
Energy Consump. (MWh)	98980	111788	124956	138285	151815	165373	178924	192468	205871	222864	240028	257459
Growth Rate (%)	673.0	12.9	11.8	10.7	9.8	8.9	8.2	7.6	7.0	6.3	5.7	5.3
<b>Public &amp; Others</b>												
No. of Customers	439	472	505	536	566	595	622	648	672	695	716	736
Customer Elasticity	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Constituent Ratio	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Power Contracted/Cust. (VA)	5150.6	5150.5	5150.5	5150.5	5150.4	5150.4	5150.4	5150.4	5150.4	5150.4	5150.3	5150.3
Power Contracted (KVA)	2261.1	2432.2	2599.3	2759.8	2915.0	3062.7	3203.0	3336.4	3481.4	3578.2	3688.5	3790.9
Consump./Cust. (KWh)	111981	110840	109821	108948	108195	107575	107077	106866	106412	107159	107988	108885
Energy Consump. (MWh)	49160	52340	55423	58379	61235	63969	66590	69110	71517	74168	77338	80144
Growth Rate (%)	208.3	6.5	6.8	6.3	4.9	4.5	4.1	3.8	3.5	3.1	2.9	2.8
<b>Industry</b>												
No. of Customers	37	43	51	60	71	82	95	104	115	126	139	153
Elasticity	1.50	1.50	1.50	1.50	1.50	1.30	1.30	1.00	1.00	1.00	1.00	1.00
Growth of Gdp Sec. (%)	12.00	12.00	12.00	12.00	12.00	12.00	12.00	10.00	10.00	10.00	10.00	10.00
Power Contracted/Cust. (VA)	3416505.5	3416504.8	3416503.9	3416503.3	3416502.8	3416502.4	3416502.1	3416501.9	3416501.7	3416501.6	3416501.4	3416501.3
Power Contracted (KVA)	124975.8	147471.4	174016.2	205339.1	242300.1	280098.8	323784.2	366173.6	391781.0	430970.0	474067.0	521473.7
Energy Consump. (MWh)	254568.5	300390.8	354461.2	418284.2	493551.7	570545.8	659550.9	725506.0	798056.6	877882.3	965848.5	1062213.3
Growth Rate (%)	18.0	18.0	18.0	18.0	18.0	15.6	15.8	10.0	10.0	10.0	10.0	10.0
<b>Total</b>												
No. of Customers	37792	41677	45573	49407	53193	56970	60428	63664	67134	70257	73193	75978
Power Contracted (KVA)	235205.8	288353.1	305519.6	347241.3	394424.6	442106.5	495329.4	536884.3	581207.0	628671.0	679597.1	734287.9
Energy Consumption (MWh)	457764.8	526700.2	604945.1	691847.9	791046.2	891973.4	1004588.0	1094142.0	1189957.0	1293159.6	1416325.2	1543024.7
Growth Rate (%)	81.9	15.1	14.7	14.5	14.3	12.7	12.6	8.9	8.8	8.2	8.0	8.9
Leases T & D (%)	15.4	15.0	14.6	14.2	13.8	13.4	12.8	12.6	12.2	11.8	11.4	11.0
Energy Sent Out (MWh)	544136.7	623025.0	711399.8	810468.8	922220.1	1034792.1	1160019.4	1267440.8	1361105.9	1479038.0	1605118.3	1740327.8
Plant Use (%)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Energy Production (MWh)	560965.7	642294	733402	835535	950742	1066796	1195896	1296931	1403202	1524781	1654761	1794152
Load Factor (%)	63.5	63.6	63.9	64.1	64.4	64.6	64.8	64.9	65.0	65.1	65.2	65.3
Peak Load (kW)	100915	115217	131117	148800	166604	188537	210573	227952	246350	267428	289868	319841

\* Actual  
Maret 1992 DKL, Divisi

**DEMAND AND SUPPLY  
PLN REGION I**

Demand & Supply	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<b>Demand</b>													
1. Sales	195.1	239.1	275.6	314.7	357.4	403.9	454.7	509.8	589.8	634.7	705	781.1	883.3
Increase	17.1	22.6	15.3	14.2	13.6	13.0	12.6	12.1	15.7	7.6	11.1	10.8	13.1
2. Losses T & D	49.8	59.1	64.8	71.5	78.3	85.3	92.4	98.9	87.2	113.7	122.1	129.6	116.9
(%)	18.8	18.3	17.8	17.3	16.8	16.3	15.8	15.3	14.8	14.3	13.8	13.3	12.8
3. Sent Out Energy	244.9	298.2	340.4	386.2	435.7	489.2	547.1	608.7	677.0	748.4	827.1	910.7	1009.2
4. Station Use	6.5	6.5	6.5	6.5	6.5	6.6	6.6	6.7	6.5	6.7	6.5	6.5	6.5
5. Gross Generation	261.9	319.0	364.2	413.2	466.2	523.5	585.5	652.4	724.4	801.8	885	974.4	1070.3
6. System Peak	63.6	74.5	84.3	94.9	106.5	119.0	132.5	147.1	162.8	178.7	187.8	217.3	238.2
7. System LF	47.0	48.9	49.3	49.7	50.0	50.2	50.4	50.5	50.8	51.2	53.8	51.2	51.3
8. Installed Capacity													
<b>Supply</b>													
Existing	143.5	140.9	139.5	139.5	138.2	126.6	121.3	118.3	117.8	114.5	94.2	91.3	89.5
Diesel	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Minihydro	143.9	141.3	139.9	139.9	138.6	127.0	121.7	118.7	118.2	114.9	94.6	91.6	89.9
Sub-total													
<b>Ongoing Projects</b>													
<b>Committed Projects</b>													
<b>Planned Projects</b>													
Mini Hydro	-	-	-	1.2	1.2	1.2	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Peusangan I & II, HEPP	-	-	-	-	-	-	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Peusangan IV, HEPP	-	-	-	-	-	-	-	30.0	30.0	30.0	30.0	30.0	30.0
Tampur stage, HEPP **]	-	-	-	-	-	-	-	-	428.0	428.0	428.0	428.0	428.0
Lawe Alas	-	-	-	-	-	-	-	-	-	-	-	-	322.0
Diesel	-	2.0	2.0	6.5	8.5	10.0	10.0	10.0	12.0	14.0	14.0	16.0	18.0
Sub-total	-	2.0	2.0	7.7	9.7	11.2	73.6	103.6	533.6	535.5	535.5	537.6	881.6
<b>Total</b>	143.9	149.3	141.9	147.6	148.3	138.2	195.3	222.3	651.8	650.5	630.2	629.2	951.5

\*) estimated

\*\*] Geographically exist in Aceh Province, energy will be sent to Region II

09/MST/WI

Energy & Load Demand Forecast  
PLN Region: I - Aceh (HIGH)

DKL 2.0

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1998	1987	1996	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>3</sup> )	3415.8	3503.1	3591.8	3680.4	3787.4	3852.2	3937.6	4024.8	4111.7	4199.3	4287.3	4374.5	4460.1	4542.3
Growth Rate (%)	2.7	2.6	2.5	2.5	2.4	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	1.8
Elec. Ratio (%)	23.0	25.3	26.4	31.2	33.9	36.7	39.5	42.4	45.2	48.1	51.0	53.8	56.8	58.8
No. of Customers (10 <sup>3</sup> )	157.0	171.4	204.1	229.3	253.5	282.6	311.3	341.1	372.1	404.2	437.3	471.4	508.7	543.2
Power Contract. (MVA)	633.8	693.8	852.7	952.4	1053.3	1194.4	1322.9	1498.0	1668.0	1851.5	2048.9	2264.8	2507.0	2761.0
Power Contract. (MVA)	102.8	105.3	133.2	149.6	166.8	194.4	202.9	222.3	242.4	263.3	284.8	307.0	329.9	353.7
Energy GDP Tot. (%)	8.89	8.88	8.88	8.80	8.88	8.78	8.74	8.75	8.68	8.62	8.55	8.48	8.43	8.38
Consump./Cust. (kwh)	543.5	593.8	623.5	518.2	515.0	513.4	517.8	523.1	528.8	533.1	540.7	548.4	558.3	570.0
Energy Consump. (GWh)	85.3	98.2	108.8	119.0	131.8	145.8	161.1	177.9	198.0	215.4	236.4	259.0	283.4	309.7
Growth (%)	10.6	15.1	8.8	11.4	10.5	10.8	10.5	10.4	10.2	9.7	9.7	9.8	9.4	9.3
Share to Total (%)	48.8	48.4	44.7	43.2	41.8	40.8	39.8	39.1	38.4	37.8	37.2	36.7	36.3	35.9
<b>Commercial</b>														
No. of Customers	16374	15012	23868	28639	28904	33103	38440	39921	43554	47308	51180	55182	59314	63383
Customer Ratio to Res.	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Elasticity	1.5	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.0	1.0	0.9
Growth of Gdp Sec. (%)	7.31	7.38	7.48	7.54	7.61	7.67	7.73	7.78	7.82	7.84	7.85	7.85	7.84	7.82
Power Contr./Cust. (VA)	1242.3	1243.3	1244.1	1244.7	1245.3	1245.7	1246.1	1246.5	1246.8	1247.0	1247.2	1247.4	1247.6	1247.8
Power Contract. (MVA)	22.8	24.5	29.7	33.4	37.2	41.2	45.4	49.8	54.3	59.0	63.8	68.8	74.0	79.3
Consump./Cust. (kwh)	1018.0	1392.7	1079.2	1118.9	1158.8	1188.1	1235.8	1277.5	1321.0	1368.8	1414.1	1462.5	1511.7	1581.2
Energy Consump. (GWh)	18.7	22.3	24.8	30.0	34.7	39.6	45.0	51.9	57.5	64.7	72.4	80.7	89.7	99.3
Growth (%)	10.8	19.2	17.0	18.3	15.8	14.5	13.7	13.3	12.8	12.4	11.9	11.5	11.1	10.7
Share to Total (%)	10.8	10.7	10.8	10.9	11.0	11.1	11.1	11.2	11.3	11.3	11.4	11.4	11.5	11.5
<b>Public &amp; Others</b>														
No. of Customers	7453	7645	8888	10887	12130	13428	14781	16193	17667	19188	20780	22383	24080	25781
Customer Ratio to Res.	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Elasticity	1.0	1.0	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1
Growth of Gdp Sec. (%)	3077.2	3080.2	3082.5	3084.4	3086.0	3087.4	3088.5	3089.5	3090.4	3091.2	3091.8	3092.4	3093.0	3093.4
Power Contr./Cust. (VA)	22.9	18.8	26.8	33.8	37.4	41.8	45.7	50.0	54.6	59.3	64.2	69.2	74.4	79.8
Power Contract. (MVA)	2618.2	2875.8	2855.2	3039.3	3143.0	3235.2	3343.4	3455.9	3563.2	3676.4	3791.4	3908.9	4022.4	4186.4
Consump./Cust. (kwh)	21.0	24.5	28.8	33.1	38.1	43.5	49.4	56.0	63.3	71.4	80.3	90.0	100.8	112.8
Energy Consump. (GWh)	0.3	16.6	18.7	15.8	15.2	14.0	13.7	13.3	13.0	12.7	12.5	12.2	11.8	11.7
Growth (%)	12.0	11.9	11.0	12.0	12.1	12.2	12.2	12.3	12.4	12.5	12.6	12.6	12.8	13.0
Share to Total (%)														
<b>Industry</b>														
No. of Customers	534	535	627	678	741	811	887	971	1022	1182	1271	1391	1522	1685
Elasticity	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Growth of Gdp Sec. (%)	12.54	10.45	10.45	9.72	9.72	9.41	8.41	9.41	9.41	9.41	9.41	9.41	9.41	9.41
Power Contr./Cust. (VA)	46506.5	57196.3	57580.9	58026.7	58496.1	58966.5	59436.9	59907.3	60377.7	60848.1	61318.5	61788.9	62259.3	62729.7
Power Contract. (MVA)	30.4	37.8	35.1	39.2	43.5	48.2	53.4	59.3	65.0	73.4	81.8	91.3	101.9	113.9
Energy Ind. Demand (GWh)	1033.6	1028.3	1107.2	1235.2	1307.2	1381.0	1459.0	1541.3	1628.3	1720.2	1819.2	1928.1	2028.1	2142.8
Energy Big Cust. (GWh)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capable Power (GWh)	982.6	1048.2	1088.1	1141.7	1198.9	1252.5	1310.8	1371.5	1435.2	1501.8	1571.6	1644.5	1720.8	1800.8
Capable Takeover (GWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Share PLN to Tot. (%)	4.80	4.59	6.09	7.57	8.44	9.31	10.17	11.02	11.88	12.69	13.52	14.34	15.15	15.95
Energy Consump. (GWh)	50.7	50.1	78.0	93.5	110.3	128.3	148.3	169.3	193.1	218.3	243.7	275.3	307.2	341.8
Growth (%)	30.0	-1.2	35.7	19.8	18.0	16.5	15.4	14.3	13.7	13.1	12.5	12.0	11.8	11.2
Share to Total (%)	29.9	25.7	32.8	33.9	35.1	36.0	36.7	37.3	37.9	38.3	38.7	39.0	39.3	39.6
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	153.3	201.9	236.3	297.7	298.3	330.2	393.4	399.2	434.4	471.8	510.5	550.4	591.3	634.3
Power Contract. (MVA)	175.7	195.9	238.8	275.8	294.7	335.3	387.4	391.4	417.3	455.0	494.9	535.0	580.3	626.7
Energy Consump. (GWh)	175.7	195.9	238.8	275.8	314.7	357.4	403.9	454.7	509.9	569.3	634.7	705.0	781.1	863.3
Growth Rate (%)	14.1	11.0	22.8	15.2	14.2	13.6	13.0	12.6	12.1	11.6	11.4	11.1	10.8	10.0
T & C Losses (%)	19.9	18.0	16.5	17.8	15.3	16.8	18.3	15.8	15.3	14.8	14.3	13.9	13.8	13.0
Energy Sent Out (GWh)	223.3	244.9	288.2	340.8	368.4	435.9	469.5	547.4	610.0	677.4	749.8	827.6	911.1	1000.7
Plant Use (%)	88.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5	81.5
Production (GWh)	238.6	261.9	319.0	364.2	413.2	488.2	523.5	595.5	624.4	724.4	801.9	885.0	974.4	1070.3
Load Factor (%)	40.8	47.0	48.9	49.3	48.7	50.0	50.2	50.4	50.8	50.8	50.9	51.1	51.2	51.3
Peak Load (MW)	58.1	63.8	74.5	84.3	84.0	108.6	110.0	132.5	147.1	162.6	178.7	197.8	217.3	238.3

MEI 1992

DKL, DIVIS/040

\* Actual # Estimated

DEMAND AND SUPPLY  
PLN REGION II

	1991/92 *	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<b>Demand</b>													
1. Sales	1580.0	1893.4	2333.0	2859.6	3488.8	4071.0	4703.6	5429.2	6261.4	7215.7	8310.2	9585.1	11004.0
Increase	8.0	19.8	23.2	22.6	21.3	17.4	15.5	15.4	15.3	15.2	15.2	15.3	14.8
2. Losses T & D	378.6	438.8	540.3	640.1	749.6	848.8	944.5	1051.0	1166.2	1291.8	1428.3	1556.6	1737.1
Increase	19.3	18.8	18.8	18.3	17.8	17.3	16.7	16.2	15.7	15.2	14.7	14.0	13.6
3. Sent Out Energy	1958.6	2332.2	2873.3	3499.7	4218.4	4919.8	5648.1	6480.2	7427.6	8507.5	9738.5	11141.7	12741.8
Increase	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4. Station Use	2026.3	2412.8	2973.1	3621.2	4364.9	5090.7	5845.2	6705.2	7685.5	8802.9	10076.1	11528.1	13184.1
Increase	359.9	459.1	574.7	688.2	814.2	940.7	1073.2	1223.5	1394.3	1588.2	1808.4	2058.5	2342.9
5. System Peak	64	60	59	60	61	62	62	63	63	63	64	64	64
6. System LF													
7. System LF													
<b>Supply</b>													
Existing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Minihydro	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0
Steam PP	180.6	139.4	139.4	139.4	139.4	139.4	139.4	118.0	118.0	118.0	118.0	118.0	0.0
GTPP	256.9	256.8	256.4	256.0	253.1	216.4	210.1	200.8	199.2	198.9	176.9	126.1	122.5
Diesel	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Import from INALUM	717.5	676.2	675.8	675.4	672.5	635.8	629.5	598.9	597.3	597.0	575.0	524.2	402.6
Sub-total	-	140.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0	260.0
Ongoing Projects													
CCPP Block I	-	-	-	-	-	-	-	-	-	-	-	-	-
(GTPP #2 & ST)	-	-	-	-	-	-	-	-	-	-	-	-	-
Committed Projects													
CCPP Block II	-	-	-	-	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0
Renun, HEPP	-	-	-	-	-	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0
Sub-total	-	-	-	-	400.0	482.0	482.0	482.0	482.0	482.0	482.0	482.0	482.0
Planned Projects													
Mini Hydro	-	-	1.4	1.4	1.4	1.4	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Sipanshaporas, HEPP	-	-	-	-	-	-	-	50.0	50.0	50.0	50.0	50.0	50.0
Wampu, HEPP	-	-	-	-	-	-	-	-	172.0	172.0	172.0	172.0	172.0
Asahan III, HEPP	-	-	-	-	-	-	-	400.0	400.0	400.0	400.0	400.0	400.0
Toru, HEPP	-	-	-	-	-	-	-	-	-	125.0	125.0	125.0	125.0
Diesel	-	-	-	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Medan #1-4, GTPP	-	-	-	-	50.0	100.0	100.0	100.0	100.0	100.0	100.0	200.0	200.0
Sub. Total	-	-	1.4	6.4	56.4	111.4	112.9	562.9	562.9	734.9	859.9	959.9	959.9
Private's Projects													
Sarula #1-2, GEOPP	-	-	-	-	-	55.0	110.0	110.0	110.0	110.0	110.0	110.0	110.0
Sibavak #1,2, GEOPP	-	-	-	-	-	-	-	110.0	110.0	110.0	110.0	110.0	110.0
Sub. Total	-	-	-	-	-	55.0	110.0	220.0	220.0	220.0	220.0	220.0	220.0
<b>Total</b>	<b>717.5</b>	<b>816.2</b>	<b>937.2</b>	<b>941.8</b>	<b>1388.9</b>	<b>1544.2</b>	<b>1594.4</b>	<b>2123.8</b>	<b>2122.2</b>	<b>2293.9</b>	<b>2396.9</b>	<b>2446.1</b>	<b>2324.5</b>

\*) estimated

Energy & Load Demand Forecast  
 PLN Region: (I - Median ( HIGH )

DKL 20

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>6</sup> )	10256.0	10488.5	10778.5	10921.1	11092.1	11291.8	11491.7	11693.8	11897.0	12081.7	12274.3	12462.8	12644.1	12814.0
Growth Rate (%)	2.1	2.1	2.0	2.0	1.8	1.8	1.8	1.8	1.7	1.6	1.5	1.5	1.5	1.3
Electr. Ratio (%)	32.2	34.8	38.0	43.0	47.1	51.3	55.7	60.1	64.8	69.3	74.0	78.8	83.8	89.0
No. of Customers (10 <sup>3</sup> )	661.3	728.0	833.2	937.0	1045.5	1150.4	1278.0	1434.7	1598.7	1774.0	1958.5	2154.7	2362.1	2581.6
Power Contr./Cust. (kVA)	584.4	655.8	746.1	846.8	958.9	1077.2	1202.5	1334.8	1474.3	1621.1	1775.2	1937.4	2108.5	2287.8
Power Contracted (kVA)	386.5	424.3	496.7	590.0	724.1	882.4	1054.2	1240.8	1443.9	1657.2	1891.8	2148.3	2428.2	2734.6
Growth of GDP Tot (%)	7.10	6.89	6.88	6.82	6.48	6.74	6.74	6.75	6.74	6.75	6.75	6.74	6.74	6.72
Consump./Cust. (kWh)	725.6	748.1	872.3	954.3	1051.3	1161.3	1284.0	1428.3	1585.5	1756.8	1944.0	2147.0	2366.0	2601.7
Energy Consump. (GWh)	478.8	544.8	560.1	620.8	684.1	756.0	835.2	922.3	1016.0	1123.3	1238.0	1366.1	1505.4	1656.4
Growth (%)	15.3	13.5	2.8	10.8	10.2	10.5	10.5	10.4	10.4	10.3	10.3	10.3	10.2	10.2
Share to Total (%)	32.4	34.5	38.8	28.6	23.9	21.8	20.5	19.8	18.8	17.8	17.2	16.4	15.7	15.1
<b>Commercial</b>														
No. of Customers	24788	25427	40012	44897	50208	55880	61425	67459	73788	80384	87257	94402	101841	109584
Customer Ratio to Res.	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Elasticity	1.47	1.10	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
Growth of Gdp Sec. (%)	5.51	5.53	5.50	5.56	5.67	5.19	5.21	5.23	5.23	5.29	5.31	5.33	5.35	5.37
Power Contr./Cust. (kVA)	3218.6	3203.2	2684.5	2686.2	2897.6	2888.8	2688.9	2690.8	2891.8	2682.3	2692.9	2693.4	2893.0	2894.3
Power Contracted (kVA)	787	82.5	107.4	120.8	134.8	146.7	165.2	181.5	198.9	218.4	235.0	254.3	274.3	293.3
Consump./Cust. (kWh)	3880.7	4223.9	3044.9	3098.4	3188.8	3228.8	3301.7	3385.1	3478.8	3583.8	3700.8	3828.4	3997.5	4118.3
Energy Consump. (GWh)	90.3	107.4	121.8	131.8	144.4	159.8	178.8	198.4	218.4	238.1	258.8	281.4	304.1	331.2
Growth (%)	24.1	11.5	13.4	7.4	8.0	6.0	5.2	4.9	4.7	4.8	4.5	4.3	4.2	4.1
Share to Total (%)	6.3	6.8	8.4	6.0	5.8	5.2	5.0	4.9	4.7	4.8	4.6	4.4	4.3	4.1
<b>Public &amp; Others</b>														
No. of Customers	14987	18338	21284	23760	26350	29088	31824	34824	38184	41283	44674	48194	51863	55863
Customer Ratio to Res.	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Elasticity	1.2	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of Gdp Sec. (%)	8.90	5.45	5.87	6.64	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04
Power Contr./Cust. (kVA)	80.2	81.2	111.3	128.6	148.7	168.5	188.5	208.5	228.5	248.5	268.5	288.5	308.5	328.5
Power Contracted (kVA)	7621.4	7898.7	7383.7	7444.7	7477.1	7426.3	7403.5	7408.0	7410.8	7415.8	7420.8	7425.8	7430.8	7435.8
Consump./Cust. (kWh)	114.1	124.0	138.6	157.8	177.7	198.4	221.0	245.7	272.8	302.3	334.4	368.5	404.6	442.6
Energy Consump. (GWh)	11.0	8.7	12.7	12.3	12.5	11.7	11.4	11.2	11.0	10.8	10.6	10.5	10.4	10.2
Growth (%)	7.7	7.6	7.4	6.8	6.2	6.7	6.4	6.2	6.0	5.8	5.6	5.4	5.3	5.1
Share to Total (%)	11.0	11.5	13.4	14.4	14.0	13.1	12.8	12.6	12.4	12.2	12.1	11.9	11.8	11.7
<b>Industry</b>														
No. of Customers	2952	2900	3956	4230	4806	5687	6522	7520	8671	9897	11287	13280	15324	17655
Customer Ratio to Res.	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Elasticity	1.7	1.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Growth of Gdp Sec. (%)	12.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Power Contr./Cust. (kVA)	137586.7	137060.9	140607.3	127131.6	113238.8	103253.1	94884.2	88084.3	82870.8	78921.8	72022.4	67773.2	64087.7	60482.8
Power Contracted (kVA)	384.8	397.3	518.4	536.6	588.4	658.4	730.0	808.0	891.9	986.0	1092.2	1200.7	1311.7	1428.7
Energy Inc. Demand (GWh)	1598.9	1690.3	1941.7	2248.7	2604.2	3002.8	3482.1	3991.7	4602.5	5308.7	6118.8	7054.7	8134.1	9378.5
Energy Big Cust. (GWh)	0	0	162	0	0	0	0	0	0	0	0	0	0	0
Capitive Power (GWh)	747.1	888.3	870.0	833.6	785.3	748.1	705.1	664.5	625.8	589.0	552.2	516.8	482.8	450.2
Share PLN to Tot. (%)	51.4	47.8	55.2	62.9	70.8	77.7	81.2	82.8	84.3	85.7	86.9	88.1	89.1	90.1
Energy Consump. (GWh)	788.3	804.0	1071.7	1415.1	1838.9	2334.5	2812.0	3307.2	3881.7	4547.7	5319.4	6213.1	7247.9	8445.5
Growth (%)	21.0	1.8	33.3	32.0	28.9	27.0	20.5	17.0	17.4	17.2	17.0	16.8	16.7	16.5
Share to Total (%)	53.4	50.8	56.8	60.7	64.3	67.3	69.1	70.3	71.5	72.6	73.7	74.8	75.8	76.7
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	703.7	772.6	895.8	1007.5	1124.4	1247.1	1378.1	1511.6	1654.1	1802.8	1957.0	2116.1	2289.0	2481.2
Power Contracted (kVA)	611.2	685.5	830.8	937.0	1045.5	1150.4	1278.0	1434.7	1598.7	1774.0	1958.5	2154.7	2362.1	2581.6
Energy Consump. (GWh)	1478.8	1580.0	1895.4	2333.0	2859.6	3468.8	4071.0	4703.8	5458.2	6281.4	7215.7	8310.2	9551.0	11004.7
Growth Rate (%)	18.5	9.8	19.8	23.2	22.6	21.3	17.4	15.5	15.4	15.3	15.2	15.1	15.1	15.1
T. & D. Losses (%)	18.2	18.7	18.2	18.2	17.7	17.2	16.7	16.2	15.7	15.2	14.7	14.2	13.7	13.2
Energy Sent Out (GWh)	1648.2	1653.8	2332.2	2873.7	3500.1	4219.0	4920.5	5649.8	6451.1	7426.7	8508.6	9739.0	11143.2	12743.5
Plant Use (%)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Production (GWh)	1910.1	2028.3	2412.0	2973.1	3621.1	4364.6	5090.7	5945.2	6705.2	7655.5	8802.8	10078.8	11528.4	13164.1
Load Factor (%)	65.1	64.3	80.0	50.1	60.2	61.2	61.8	62.2	62.6	62.9	63.0	63.8	64.2	64.2
Peak Load (MW)	335.1	350.9	459.1	574.7	680.2	814.2	940.3	1073.2	1223.8	1394.3	1588.2	1806.4	2058.3	2342.9

DKL DIVS/9/855

M E I 1992

\* Actual # Estimated  
 +) Losses to production

DEMAND AND SUPPLY  
PLN REGION III

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<b>Demand</b>													
1. Sales	702.8	860.0	1031.2	1185.5	1359.1	1555.3	1777.3	2028.3	2312.0	2632.5	2994.6	3404	3866.6
Increase	16.2	22.4	19.9	15.0	14.6	14.4	14.3	14.1	14.0	13.9	13.8	13.7	13.6
2. Losses T & D	184.8	219.2	254.5	283.2	314.1	347.4	383.4	422.3	464.1	509.1	557.4	609.2	664.5
Increase	20.8	20.3	19.8	19.3	18.8	18.3	17.7	17.2	16.7	16.2	15.7	15.2	14.7
3. Sent Out Energy	887.6	1079.2	1285.7	1468.7	1673.2	1902.7	2160.7	2450.6	2776.1	3141.6	3552.0	4013.2	4531.2
Increase	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
4. Station Use	910.3	1106.9	1318.7	1506.4	1716.1	1951.5	2216.2	2513.5	2847.3	3222.2	3643.1	4116.1	4647.4
Increase	185.3	218.7	255.3	289.0	328.7	368.9	416.2	489.0	528.1	594.2	668.1	750.9	843.5
5. Gross Generation	56	58	59	60	60	60	61	59	62	62	62	63	63
6. System Peak													
7. System LF													
Supply													
Existing	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Mini Hydro	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5	78.5
Hydro	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7
GTTP	145.3	142.7	142.3	142.1	142.1	131.8	119.9	111.6	111.6	110.6	102.8	97.9	81.8
Diesel	267.1	264.5	264.1	263.9	263.9	253.6	241.7	190.7	190.7	189.7	181.9	177.0	160.7
Sub-total													
Ongoing Project													
Padang, GTTP		30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Kotopanjang # 1-3							114.0	114.0	114.0	114.0	114.0	114.0	114.0
Singkarak # 1-4													
P. Baru, DPP		15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Sub. Total		45.2	75.2	75.2	75.2	75.2	189.2	364.2	364.2	364.2	364.2	364.2	364.2
Committed Projects													
Ombilin # 1-2, STCFPP					200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0	200.0
Planned Projects													
Kerinci, GEOPP		24.5	32.8	58.8	65.8	73.8	84.8	93.3	103.3	103.3	103.3	103.3	103.3
Diesel													
Minihydro													
Sub. Total		24.5	32.8	61.5	70.9	83.9	94.9	103.4	113.4	113.4	113.4	113.4	113.4
Total	267.1	334.2	372.1	400.6	610.0	612.7	725.8	858.3	868.3	867.3	859.5	854.6	838.3

09/MST/W3



Energy & Load Demand Forecast  
 PLN Region: III - Padang ( HIGH )

DKL 2.0

Fiscal Year	1990*	1991#	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>3</sup> )	7305.3	7504.8	7708.8	7917.7	8121.0	8329.5	8530.1	8741.8	8956.1	9170.6	9387.1	9599.8	9805.4	10015.6
Growth Rate (%)	2.8	2.7	2.7	2.7	2.6	2.5	2.5	2.5	2.5	2.4	2.4	2.3	2.1	2.1
Elect. Ratio (%)	24.1	25.9	28.4	30.8	33.8	37.4	40.4	43.8	47.7	51.1	55.2	59.8	64.9	71.3
No. of Customers (10 <sup>3</sup> )	352.0	389.4	435.5	483.8	534.0	587.1	643.8	703.2	765.7	831.4	900.3	972.8	1049.8	1131.1
Power Contr./Cust.(VA)	641.0	627.8	659.1	679.8	699.8	719.7	739.5	759.2	778.9	798.6	818.3	838.0	857.7	877.4
Power Contracted (MVA)	221.9	244.5	320.0	370.9	422.7	475.7	528.9	583.2	641.6	699.0	756.8	814.8	872.5	930.7
Growth o/GDP Tol. (%)	5.88	5.90	5.91	5.90	5.92	5.92	5.92	5.91	5.78	5.77	5.75	5.73	5.72	5.70
Share PLN to Tot. (%)	895.2	733.8	616.2	592.0	574.8	568.5	562.2	554.0	545.8	537.6	529.4	521.2	513.0	504.8
Energy Consump. (GWh)	240.3	285.7	289.2	303.5	308.9	314.2	319.5	324.8	330.1	335.4	340.7	346.0	351.3	356.6
Growth (%)	11.3	18.9	4.7	11.6	10.8	11.4	11.4	11.5	11.4	11.4	11.4	11.3	11.3	11.3
Share to Total (%)	41.0	38.2	34.8	32.4	31.2	30.3	29.5	28.6	28.1	27.5	26.9	26.3	25.8	25.3
<b>Commercial</b>														
No. of Customers	21050	22883	30231	35130	40102	45182	50373	55880	61107	66582	72108	77888	83316	88987
Customer Ratio to Res.	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Elasticity	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of Gdp Sec. (%)	8.75	8.78	8.82	8.85	8.88	8.92	8.95	8.98	8.95	8.92	8.88	8.85	8.82	8.80
Power Contr./Cust.(VA)	1890.3	1832.5	1941.7	1849.8	1836.0	1861.0	1863.0	1868.3	1871.1	1873.5	1875.8	1877.3	1878.8	1880.2
Power Contracted (MVA)	411.3	451.9	55.7	68.5	76.4	84.8	92.0	109.8	120.4	131.4	142.5	153.9	164.9	176.2
Consump./Cust.(kwh)	2227.2	2512.7	2053.6	2058.6	2158.2	2135.7	2189.8	2217.5	2275.8	2344.7	2424.4	2514.2	2614.3	2725.0
Energy Consump. (GWh)	46.9	57.7	63.0	73.3	84.5	98.4	109.3	123.5	138.1	156.1	174.8	195.3	217.3	242.5
Growth (%)	16.4	23.1	9.2	16.3	13.3	14.0	13.4	13.0	12.8	12.3	12.0	11.7	11.5	11.3
Share to Total (%)	7.8	6.6	7.3	7.1	7.1	7.1	7.0	6.9	6.9	6.8	6.8	6.8	6.4	6.3
<b>Public &amp; Others</b>														
No. of Customers	12992	13844	18414	21364	24411	27503	30663	33893	37197	40530	43894	47299	50716	54188
Customer Ratio to Res.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Elasticity	0.5	0.2	0.3	0.5	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Growth of Gdp Sec. (%)	3063.6	3077.7	3123.9	3106.5	3093.3	3092.8	3074.2	3097.2	3091.2	3058.2	3051.9	3048.1	3044.8	3042.0
Power Contr./Cust.(VA)	40.0	40.5	57.5	88.4	75.8	84.8	84.3	104.0	113.9	123.9	134.0	144.1	154.4	164.8
Power Contracted (MVA)	4234.4	4624.8	3703.1	3441.8	3345.7	3285.2	3208.5	3208.5	3160.3	3124.6	3081.9	3072.3	3069.4	3069.4
Consump./Cust.(kwh)	55.2	61.7	96.2	78.0	84.0	92.0	100.2	108.7	117.3	126.6	136.0	145.7	155.3	165.3
Energy Consump. (GWh)	10.7	11.9	19.5	17.5	10.5	9.8	9.9	8.5	7.7	7.4	7.1	6.9	6.7	6.7
Growth (%)	10.7	11.9	19.5	17.5	10.5	9.8	9.9	8.5	7.7	7.4	7.1	6.9	6.7	6.7
Share to Total (%)	9.1	8.2	7.8	7.4	7.1	6.8	6.4	6.1	5.8	5.5	5.2	4.9	4.8	4.3
<b>Industry</b>														
No. of Customers	759	795	1054	1181	1347	1516	1711	1928	2173	2449	2781	3113	3510	3958
Customer Ratio to Res.	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Elasticity	11.20	9.34	9.35	8.71	8.72	8.45	8.40	8.48	8.47	8.46	8.46	8.50	8.51	8.51
Growth of Gdp Sec. (%)	109440.1	111600.0	158691.3	179892.3	175417.1	172323.3	170269.5	169099.2	168742.1	168107.9	170314.4	172136.8	174596.3	177600.9
Power Contr./Cust.(VA)	83.1	88.7	187.2	214.1	236.6	261.6	291.3	326.6	368.6	414.3	470.2	535.8	612.3	703.2
Power Contracted (MVA)	743.8	754.7	966.9	1093.1	1236.0	1392.6	1598.2	1766.6	1966.2	2246.8	2532.6	2835.7	3220.3	3631.2
Energy Ind. Demand (GWh)	0	0	80.84	87.47	0	0	0	0	0	0	0	0	0	0
Energy Big Cust. (GWh)	481.3	480.3	537.1	644.9	566.0	634.1	692.9	735.4	782.1	833.2	892.4	960.4	1087.3	1190.2
Capitive Power (GWh)	0.0	0.0	0.0	26.8	27.2	28.4	31.7	34.1	36.8	39.8	42.7	46.0	49.3	53.4
Share PLN to Tot. (%)	33.28	35.03	44.44	50.15	52.35	54.47	56.48	58.42	60.28	62.02	63.71	65.32	66.86	68.33
Energy Consump. (GWh)	292.3	284.4	428.7	548.1	647.1	756.5	885.4	1035.1	1201.1	1383.5	1613.8	1885.3	2152.8	2481.0
Growth (%)	20.8	0.3	82.5	27.6	16.0	17.2	18.9	18.3	18.3	18.0	15.8	15.6	15.4	15.2
Share to Total (%)	43.4	39.5	35.0	33.2	34.6	35.8	37.0	38.1	39.2	40.3	41.3	42.3	43.2	44.2
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	3973	427.1	535.2	621.5	709.4	798.3	891.2	995.1	1091.2	1178.1	1276.0	1374.9	1474.7	1576.2
Power Contracted (MVA)	388.2	422.8	605.3	716.9	813.0	910.7	1014.4	1124.7	1242.5	1366.5	1503.3	1646.4	1805.8	1978.9
Energy Consump. (GWh)	604.7	689.5	890.0	1031.2	1195.5	1359.1	1535.3	1717.3	2026.3	2312.0	2692.5	2994.8	3404.0	3869.8
Growth Rate (%)	15.7	10.7	26.5	19.9	18.0	14.8	14.4	14.3	14.1	14.0	13.9	13.8	13.7	13.8
T & D Losses (%)	18.6	18.1	18.6	19.3	18.6	17.8	17.3	16.8	16.3	16.3	15.8	15.3	14.3	14.3
Energy Sent Out (GWh)	757.3	832.6	1092.3	1295.7	1488.7	1673.2	1902.7	2160.7	2450.8	2778.1	3141.6	3532.0	4013.2	4531.2
Plant Use (%)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Production (GWh)	778.5	854.0	1090.1	1318.7	1506.4	1718.1	1951.5	2218.1	2513.5	2847.3	3222.1	3643.1	4118.1	4647.4
Load Factor (%)	53.8	52.5	58.0	59.0	58.5	60.0	60.4	60.8	61.2	61.5	61.9	62.2	62.6	62.9
Peak Load (MW)	185.1	195.7	222.1	255.3	288.0	328.7	385.9	418.2	468.0	528.2	594.2	662.2	739.8	824.3

DKL DIVIS/055

MEI 1992

\* Actual # Estimated  
 +1 Losses to production

DEMAND AND SUPPLY  
PLN REGION IV

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
1. Sales	1121.1	1280.4	1456.6	1553.0	1870.7	2115.0	2389.3	2697.2	3041.9	3427.8	3659.8	4343.3	4884.8
Increase	14.2	14.2	13.8	13.5	13.2	13.1	13.0	12.9	12.8	12.7	12.6	12.5	12.5
2. Losses T & D	257.0	283.1	310.4	339.1	389.1	401.0	434.8	470.5	508.1	547.4	588.4	631.0	682.0
(%)	18.6	18.1	17.8	17.0	16.5	15.9	15.4	14.9	14.3	13.8	13.2	12.7	12.3
3. Sent Out Energy	1378.1	1563.6	1766.9	1992.2	2239.8	2516.0	2824.2	3167.5	3550.0	3975.2	4468.1	4974.3	5566.5
(%)	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
4. Station Use	1494.5	1695.6	1916.2	2160.4	2429.0	2728.5	3062.7	3435.3	3849.9	4311.0	4823.9	5394.5	6036.7
5. Gross Generation	293.4	330.3	370.8	415.3	464.2	518.5	579.0	646.2	720.7	803.3	894.9	996.5	1110.6
6. System Peak	58	59	59	59	60	60	60	61	61	61	62	62	62
7. System LF													
Supply													
Existing													
Minihydro	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42	2.42
Hydro	16	16	16	16	16	16	16	16	16	16	16	16	16
GTPP	36.01	36.01	36.01	21.35	21.35	21.35	21.35	0	0	0	0	0	0
Steam Coal	130	130	130	130	130	130	130	130	130	130	130	130	130
Steam Oil	25	25	25	25	25	25	25	25	0	0	0	0	0
Diesel	291.2	291	291	267.3	287.3	286.2	273.7	267.1	264.3	263.3	233.9	225.8	212.1
Sub-Total	500.63	500.43	500.43	482.07	482.07	480.97	468.47	440.52	412.72	411.72	382.32	374.22	360.52
Ongoing													
B. Asam #3, HEPP				65	65	65	65	65	65	65	65	65	65
Lampung, DPP	10	40	40	40	40	40	40	40	40	40	40	40	40
Sub-Total	10	40	40	105	105	105	105	105	105	105	105	105	105
Committed Projects													
B. Asam #4, HEPP				65	65	65	65	65	65	65	65	65	65
Planned Projects													
Mini Hydro								1.3	1.3	1.3	1.3	1.3	1.3
Beaol						80.0	80.0	90.0	90.0	90.0	80.0	90.0	90.0
Musl									210.0	210.0	210.0	210.0	210.0
Merangin									338.5	338.5	338.5	338.5	338.5
Ketaun												84.0	84.0
Batuteigi, HEPP												24	24
Patemban, GTPP				60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Tarahan #1-2								65.0	130.0	130.0	130.0	130.0	130.0
Diesel		27.0	28.0	63.0	67.0	92.3	96.0	108.0	118.0	118.0	128.0	131.0	138.0
Import from Java					100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sub-Total :		27.0	28.0	123.0	227.0	342.5	346.0	422.3	1089.9	1071.8	1081.8	1168.8	1173.8
TOTAL	510.6	587.4	589.4	710.1	878.1	993.5	984.5	1032.8	1652.5	1653.5	1634.1	1713.0	1704.3

ORNS/STANA

Energy & Load Demand Forecast  
PLN Region: IV - Palembang ( HIGH )

DKL2.0

Fiscal Year	1860*	1881#	1892	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2003
<b>Residential</b>															
Population (10 <sup>6</sup> )	15478.1	15915.1	16360.6	16636.9	17253.9	17698.7	18141.4	18593.1	19045.1	19487.9	19908.6	20318.2	20702.0	21089.4	21089.4
Growth Rate (%)	3.1	2.8	2.8	2.7	2.8	2.8	2.5	2.5	2.4	2.3	2.2	2.0	1.9	1.9	1.9
Elect. Ratio (%)	16.3	16.7	18.3	21.0	22.7	24.5	26.4	28.4	30.4	32.4	34.5	36.8	38.8	41.0	41.0
No. of Customers (10 <sup>3</sup> )	505.1	531.8	630.4	704.8	784.0	868.4	954.7	1054.7	1157.8	1264.1	1374.3	1488.5	1606.8	1726.5	1726.5
Power Contract (MVA)	891.5	892.4	881.0	884.1	886.7	889.0	891.0	892.7	894.2	895.3	896.7	897.7	898.6	899.4	899.4
Power Contract (MVA)	349.2	384.1	428.3	482.2	536.4	596.3	662.2	730.8	803.6	878.2	957.5	1038.5	1122.5	1208.7	1208.7
Growth of GDP Tot (%)	7.30	6.98	7.01	6.92	6.86	6.77	6.78	6.80	6.81	6.82	6.83	6.84	6.85	6.86	6.86
Consump./Cust (kwh)	860.8	818.0	810.8	799.9	791.0	786.2	784.0	784.4	786.7	792.9	802.8	812.5	821.2	828.7	848.7
Energy Consump. (GWh)	417.8	454.6	511.0	583.8	620.1	682.7	751.5	827.3	910.7	1005.3	1105.1	1213.8	1335.8	1489.5	1489.5
Growth (%)	6.7	6.9	12.4	10.3	10.0	10.1	10.1	10.1	10.1	10.1	10.0	10.0	10.0	10.0	10.0
Share to Total (%)	43.1	44.7	39.8	38.7	37.5	36.5	35.5	34.8	33.8	33.0	32.2	31.4	30.7	30.1	30.1
<b>Commercial</b>															
No. of Customers	25188	27143	31841	35803	39597	43680	48410	53271	58488	63847	68414	75180	81158	87356	87356
Customer Ratio to Res.	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Elasticity	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of Gdp Sec (%)	6.32	6.34	6.36	6.38	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39	6.39
Power Contract (MVA)	2847.9	2833.7	2830.3	2827.1	2824.3	2822.0	2819.9	2818.1	2816.5	2815.1	2813.8	2812.8	2811.9	2811.0	2811.0
Power Contract (MVA)	74.2	88.2	90.1	100.7	111.8	123.8	136.5	150.1	164.7	178.7	195.3	211.5	228.2	245.8	245.8
Consump./Cust (kwh)	3248.3	3235.7	3290.8	3342.1	3404.1	3459.5	3516.8	3583.8	3657.8	3743.8	3841.1	3948.1	4057.8	4192.7	4192.7
Energy Consump. (GWh)	81.8	82.7	104.8	118.0	134.6	151.9	170.2	180.8	213.9	239.0	268.8	298.8	330.1	388.6	388.6
Growth (%)	11.2	13.4	13.0	13.6	13.3	12.5	12.3	12.1	12.0	11.8	11.5	11.4	11.2	11.1	11.1
Share to Total (%)	8.4	9.1	8.2	8.2	8.2	8.1	8.0	8.0	7.9	7.8	7.8	7.7	7.6	7.5	7.5
<b>Public &amp; Others</b>															
No. of Customers	14187	14751	17778	18878	22108	24488	27928	29740	32641	35844	38782	41971	45307	48769	48769
Customer Ratio to Res.	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Elasticity	1.3	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Growth of Gdp Sec (%)	3020.2	3672.7	3937.2	3988.7	4047.4	4081.4	4129.8	4183.8	4193.5	4219.3	4241.8	4261.8	4279.2	4294.9	4294.9
Power Contract (MVA)	85.5	51.9	70.0	78.4	88.5	100.2	111.8	123.8	136.8	150.4	164.4	178.3	193.6	208.5	208.5
Consump./Cust (kwh)	5592.9	5598.9	5306.0	5611.5	5651.1	5677.8	5713.8	5763.2	5818.8	5922.8	5983.0	6053.0	6107.9	6225.0	6225.0
Energy Consump. (GWh)	70.2	70.7	80.3	111.5	124.0	139.0	154.5	171.4	190.0	210.0	231.8	255.3	280.8	306.5	306.5
Growth (%)	7.2	0.6	24.8	12.3	12.0	11.3	11.1	11.0	10.8	10.8	10.3	10.2	10.0	9.8	9.8
Share to Total (%)	8.2	7.8	7.8	7.7	7.6	7.4	7.3	7.2	7.0	6.8	6.8	6.8	6.8	6.8	6.8
<b>Industry</b>															
No. of Customers	1281	1286	1038	1825	2034	2239	2508	2786	3084	3437	3817	4240	4710	5232	5232
Elasticity	1.5	1.5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Growth of Gdp Sec (%)	12.81	10.76	10.77	10.02	10.02	9.70	8.70	8.70	8.71	8.71	8.71	8.72	8.72	8.72	8.72
Power Contract (MVA)	187085.3	182427.1	184840.8	187828.3	170852.8	173805.8	177478.3	181357.0	185542.8	190028.7	194815.2	198988.3	203278.6	210650.0	210650.0
Power Contract (MVA)	210.8	203.5	270.2	306.0	347.1	392.8	445.2	505.3	574.1	653.1	743.7	847.8	966.9	1103.7	1103.7
Energy Ind. Demand (GWh)	1873.5	1942.8	2181.2	2450.3	2707.8	3007.2	3393.8	3709.5	4119.8	4575.8	5082.8	5645.8	6271.2	6966.2	6966.2
Energy Big Cust. (GWh)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Small Cust. (GWh)	1484.3	1425.4	1815.9	1788.1	1834.7	2108.9	2301.0	2308.8	2737.1	2985.4	3256.3	3551.8	3874.3	4228.2	4228.2
Energy Takeover (GWh)	0.0	0.0	0.0	32.3	35.4	38.7	42.2	46.0	50.2	54.7	59.7	65.1	71.0	77.5	77.5
Share PLN to Tot (%)	20.77	24.37	20.02	27.25	28.95	28.94	31.10	32.34	33.58	34.78	35.83	37.09	38.22	39.33	39.33
Energy Consump. (GWh)	389.2	390.8	583.3	882.2	773.2	897.4	1038.8	1188.4	1382.7	1580.5	1826.4	2083.8	2398.8	2740.0	2740.0
Growth (%)	3.6	0.4	44.7	17.1	18.8	16.8	15.8	15.5	15.3	15.0	14.6	14.8	14.5	14.3	14.3
Share to Total (%)	40.2	38.4	44.2	43.5	46.8	48.0	48.1	50.2	51.3	52.3	53.3	54.2	55.2	56.1	56.1
<b>Total</b>															
No. of Customers (10 <sup>3</sup> )	545.8	574.8	681.7	762.2	847.7	939.0	1038.4	1140.5	1251.8	1367.3	1486.3	1608.8	1737.9	1870.9	1870.9
Power Contract (MVA)	899.8	708.5	359.7	868.3	1086.7	1215.0	1355.6	1508.6	1676.3	1862.5	2080.9	2279.3	2511.5	2766.5	2766.5
Energy Consump. (GWh)	887.7	1017.3	1280.4	1458.8	1653.0	1870.7	2115.0	2386.3	2697.2	3041.8	3427.3	3858.8	4343.3	4864.5	4864.5
Growth Rate (%)	7.1	5.2	25.8	13.8	13.1	13.2	13.1	13.0	12.9	12.8	12.7	12.8	12.8	12.5	12.5
T & D Losses (%)	17.5	16.5	16.0	16.1	15.6	15.1	14.8	14.1	13.8	13.6	13.4	13.2	13.1	13.2	13.2
Plant Use (%)	1196.8	1236.8	1549.8	1765.0	1990.0	2237.4	2613.3	2821.1	3164.4	3546.2	3970.8	4443.4	4969.0	5590.5	5590.5
Plant Life (yr)	7.9	7.9	7.9	7.9	7.9	7.8	7.8	7.8	7.9	7.9	7.9	7.9	7.9	7.9	7.9
Energy Sent Out (GWh)	1302.8	1346.1	1692.3	1918.2	2160.5	2429.0	2726.5	3027.7	3435.3	3849.9	4311.0	4823.9	5394.5	6030.7	6030.7
Production (GWh)	63.6	63.4	85.0	50.0	56.4	59.7	60.4	60.4	60.7	61.0	61.3	61.5	61.8	62.0	62.0
Load Factor (%)	83.8	83.4	85.0	85.0	85.4	85.7	86.0	86.0	86.2	86.2	86.3	86.4	86.5	86.5	86.5
Peak Load (MW)	232.7	242.4	293.3	370.8	415.3	484.2	518.3	579.0	648.2	720.7	803.3	884.8	982.8	1110.8	1110.8

DKL DIVS/6/55

M E I 1992

\* Actual # Estimated  
+ Losses to production

DEMAND AND SUPPLY  
PLN REGION V

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
1. Sales Increase (GWh)	240.5	267.5	296.4	338.3	384.9	437.2	495.9	561.6	634.5	715.8	806.8	906.7	1022.8
(%)	11.2	11.2	10.8	14.1	13.8	13.6	13.4	13.2	13.0	12.8	12.7	12.4	12.3
2. Losses T & D (GWh)	56.6	60.7	65.0	71.7	78.6	86.0	93.9	102.5	110.8	119.9	129.6	141.6	150.0
(%)	18.3	17.8	17.3	16.8	16.3	15.8	15.3	14.8	14.3	13.8	13.3	12.6	12.3
3. Sent Out Energy (GWh)	297.1	328.2	361.4	410.0	463.5	523.2	569.8	664.1	745.3	835.7	936.4	1048.3	1172.8
4. Station Use (GWh)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	6.1	3.9	3.9	3.9
5. Gross Generation (GWh)	309.2	341.6	376.1	426.7	482.4	544.5	613.8	691.2	775.7	839.8	974.6	1091	1220.6
6. System Peak (MW)	62.7	69.1	76.1	85.5	95.8	107.3	120.0	134.2	149.6	166.7	185.6	206.6	229.8
7. System LF (%)	56	56	56	57	57	58	58	59	59	61	60	60	61
8. Installed Capacity (MW)													
Supply													
Diesel	113.6	113.4	111.2	111.2	106.9	106.4	91.1	90.5	90.5	89.9	89.1	85.2	84.4
Ongoing Projects													
Potianak, DPP			15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Committed Projects													
Planned Projects													
Mini Hydro								1.7	1.7	1.7	1.7	1.7	1.7
Pace Kembayung											30.0	30.0	30.0
Pontianak #5												25.0	25.0
Diesel		4.0	5.0	21.5	21.5	23.5	27.0	27.5	27.5	28.5	29.5	30.5	31.5
Sub-total		4.0	5.0	21.5	21.5	23.5	27.0	29.2	29.2	30.2	61.2	87.2	88.2
Private's Projects													
Pontianak #1-4							50.0	75.0	100.0	100.0	100.0	100.0	100.0
Total	113.6	117.4	131.4	147.9	143.6	145.1	183.3	209.9	234.9	235.3	265.5	287.6	287.8

\*Estimated

09/MST/W5

Energy & Load Demand Forecast  
 PLN Region: V - Pontianak ( HIGH )

DKL 2.0

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	2000	2001	2002	2003
<b>Residential</b>													
Population (10 <sup>3</sup> )	3238.2	3321.8	3405.0	3480.1	3572.6	3658.5	3741.5	3827.9	3914.4	3997.8	4077.3	4154.4	4232.2
Growth Rate (%)	2.7	2.6	2.5	2.3	2.4	2.3	2.3	2.3	2.3	2.1	2.0	1.9	1.8
Elect. Rate (%)	16.8	20.2	21.7	25.4	25.1	26.8	28.5	30.2	31.9	33.9	35.3	37.1	38.9
No. of Customers (10 <sup>3</sup> )	120.3	134.3	147.5	163.1	178.3	195.0	213.3	231.2	249.8	268.2	286.2	304.8	323.6
Power Contr./Cust.(kVA)	627.4	628.8	633.7	655.3	653.0	652.4	652.2	652.4	652.2	652.0	651.8	651.8	651.8
Power Contracted(MVA)	75.5	84.1	88.4	106.8	117.1	127.9	139.2	150.8	162.8	173.2	187.8	202.8	214.1
Growth of GDP Tot.(%)	6.85	6.80	6.80	6.54	6.32	6.42	6.42	6.43	6.45	6.47	6.48	6.50	6.51
Consump./Cust.(kwh)	816.8	857.2	786.0	791.8	790.2	793.5	800.4	810.7	824.0	838.1	851.5	869.9	881.0
Energy Consump.(GWh)	98.5	112.4	117.4	129.2	141.6	155.5	170.7	187.4	205.6	224.7	245.4	266.1	292.8
Growth (%)	14.8	14.1	4.5	10.0	8.7	8.8	8.8	9.2	9.2	9.2	9.2	9.2	9.2
Share to Total (%)	44.8	44.3	43.9	43.8	41.9	40.4	39.0	37.8	36.8	35.4	34.3	33.2	31.3
<b>Commercial</b>													
No. of Customers	13642	14203	15222	20280	22280	24337	26488	28712	31019	33280	35787	38272	40698
Customer Ratio to Res.	0.11	0.10	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Elasticity	1.2	0.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of Gdp Sec.(%)	5.66	5.82	5.93	5.69	6.02	5.57	5.90	5.93	5.88	5.70	5.73	5.76	5.78
Power Contr./Cust.(kVA)	2050.1	2075.5	1857.1	1856.5	1853.0	1853.4	1854.8	1854.8	1854.2	1853.0	1853.7	1853.4	1853.2
Power Contracted(MVA)	27.9	30.9	34.0	37.8	41.3	45.2	48.1	53.2	57.5	61.9	66.4	70.9	75.8
Consump./Cust.(kwh)	2483.4	2612.1	2293.4	2322.4	2370.8	2414.5	2457.7	2509.4	2589.4	2681.4	2742.2	2830.3	2931.7
Energy Consump.(GWh)	33.1	37.1	41.0	47.1	52.8	58.8	65.3	72.5	80.3	88.8	98.2	108.3	119.4
Growth (%)	20.1	12.0	12.8	12.5	12.2	11.3	11.1	11.0	10.8	10.8	10.5	10.4	10.2
Share to Total (%)	15.1	14.9	15.8	15.9	15.6	15.3	14.9	14.8	14.3	14.0	13.7	13.4	12.9
<b>Public &amp; Others</b>													
No. of Customers	4533	4682	5763	6372	7002	7955	8931	9931	9756	10489	11259	12038	12833
Customer Ratio to Res.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Elasticity	0.8	0.1	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Growth of Gdp Sec.(%)	3440.1	3452.0	3391.2	3592.1	3592.4	3593.4	3594.4	3594.4	3594.6	3594.2	3593.5	3593.8	3593.3
Power Contr./Cust.(kVA)	4551.8	4549.3	4185.9	4187.5	4201.1	4223.3	4258.8	4258.8	4301.2	4354.1	4418.5	4497.6	4577.6
Power Contracted(MVA)	18.7	21.3	24.0	28.6	29.3	32.2	35.2	38.5	42.0	45.7	49.7	54.0	58.6
Consump./Cust.(kwh)	10.6	8.0	12.7	10.7	10.4	8.7	8.6	8.3	8.1	8.0	8.5	8.5	8.4
Energy Consump.(GWh)	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Growth (%)	0.2	8.5	0.0	9.0	8.7	8.4	8.1	7.8	7.5	7.2	6.5	6.7	6.2
<b>Industry</b>													
No. of Customers	398	407	497	553	618	681	765	858	826	1029	1137	1290	1366
Customer Ratio to Res.	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Elasticity	12.00	10.00	10.00	9.30	9.30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Growth of Gdp Sec.(%)	38748.1	97978.8	78251.5	78307.7	80543.0	81948.9	83711.0	85413.0	87911.4	89791.4	92347.3	95183.4	98253.2
Power Contr./Cust.(kVA)	34.6	39.8	38.9	43.8	49.3	55.5	63.1	71.4	81.0	92.2	103.0	119.9	137.2
Power Contracted(MVA)	448.9	450.4	559.3	621.8	691.2	785.8	848.5	940.1	1041.7	1154.2	1279.8	1417.0	1570.0
Energy Incl.Demand(GWh)	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Big Cust.(GWh)	377.5	371.7	478.2	528.2	578.8	627.3	682.6	742.8	807.9	876.0	958.4	1040.5	1132.1
Capitive Power(GWh)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Share PLN to Tot.(%)	15.35	17.47	15.05	15.05	16.86	16.09	16.56	17.02	17.84	18.22	18.57	19.11	20.8
Energy Consump.(GWh)	60.4	76.7	84.2	93.6	114.8	136.5	169.0	197.8	233.8	275.2	322.3	376.4	437.8
Growth (%)	17.3	18.0	7.0	11.2	22.4	20.8	18.9	18.3	17.7	17.2	16.3	16.3	16.0
Share to Total (%)	31.1	31.5	31.5	31.8	33.8	36.0	38.0	39.8	41.8	43.4	45.1	46.7	48.7
<b>Total</b>													
No. of Customers (10 <sup>3</sup> )	136.4	153.6	172.1	190.3	209.1	228.6	248.8	268.8	291.5	313.7	336.4	359.7	383.8
Power Contracted(MVA)	152.9	166.8	190.1	210.9	233.0	258.4	281.3	307.9	336.5	361.0	389.8	435.0	473.1
Energy Consump.(GWh)	218.8	248.5	267.5	296.4	339.3	384.9	437.2	485.9	541.8	604.5	673.6	752.9	852.9
Growth Rate (%)	16.0	13.5	7.2	10.8	14.2	14.3	13.8	13.3	12.9	12.8	12.7	12.8	12.5
T & D Losses (%) +	16.8	17.5	17.0	17.3	16.8	16.3	15.8	15.3	14.8	14.3	13.8	13.3	12.8
Energy Sent Out(GWh)	272.4	305.1	325.0	391.4	410.0	403.3	423.2	469.7	514.0	563.7	619.3	689.2	772.7
Plant Use (%)	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Production (GWh)	293.9	317.5	336.2	376.1	426.7	482.4	544.5	613.8	691.1	775.7	866.8	974.3	1091.0
Load Factor (%)	55.7	55.7	55.8	56.4	57.0	57.5	57.9	58.4	58.6	59.2	59.9	60.3	60.8
Peak Load (MW)	50.2	65.0	60.1	70.1	85.5	95.8	107.3	120.0	148.8	166.7	183.9	208.8	238.9

DKL DIVISYON 55

M E I 1992

\* Actual # Estimated  
 † Error in production

DEMAND AND SUPPLY  
PLN REGION VI

	1991/92 *)	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
1. Sales	831.1	1001.8	1166.0	1299.5	1500.7	1668.0	1848.7	2039.7	2238.2	2450.8	2684.8	2942.7	3245.8
Increase	14.9	20.5	16.4	11.4	15.5	11.2	10.8	10.3	9.7	9.5	9.5	9.6	10.3
2. Losses T & D	87.8	102.2	118.9	132.5	153.1	170.1	188.6	208.0	228.3	250.0	273.8	300.1	331.1
(%)	9.6	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
3. Sent Out Energy	918.9	1103.9	1285.0	1432.0	1653.7	1838.1	2037.3	2247.7	2466.5	2700.7	2958.7	3242.8	3576.9
4. Station Use	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5. Gross Generation	947.8	1141.1	1325.4	1477.0	1705.7	1895.9	2101.3	2318.3	2544.0	2785.6	3051.6	3344.7	3689.3
6. System Peak	188.8	218.6	250.0	276.8	315.1	348.2	383.8	421.5	460.7	502.5	548.1	598.1	655.6
7. System LF	57.3	59.6	60.5	60.9	61.8	62.2	62.5	62.8	63.0	63.3	63.6	63.8	64.2
Supply													
Existing													
Hydro	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
GTPP	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Diesel	222.7	221.2	219.4	218.0	218.0	214.9	160.3	135.1	134.9	134.6	131.4	123.5	104.9
Sub-total	264.7	263.2	261.4	260.0	260.0	256.9	202.3	177.1	176.9	176.6	173.4	155.5	146.9
Ongoing Projects													
Samarinda, DPP	-	-	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Banjarmasin, DPP	-	24	24	24	24	24	24	24	24	24	24	24	24
Sub-total	-	24	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
Committed Projects													
Banjarmasin, DPP	-	-	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Planned Projects	-	-	-	-	-	-	-	-	-	-	-	-	-
Mini Hydro	-	-	-	-	-	-	-	-	-	-	-	-	-
Kusan	-	-	-	-	-	-	-	-	-	-	-	-	-
B. Masin #1-4, STCFPP	-	-	-	-	-	90.0	90.0	135.0	135.0	135.0	180.0	180.0	180.0
Samarinda, GTPP	-	-	-	-	-	-	-	-	30.0	30.0	30.0	30.0	30.0
Samarinda #1-4, CCPP	-	-	66.0	66.0	99.0	99.0	99.0	99.0	132.0	132.0	132.0	132.0	132.0
Diesel	-	21	29.5	53	54	71	86	92.5	92.5	93.5	99.5	104.5	109.5
Sub-total	-	21	95.5	119.4	153.4	260.4	275.4	326.9	457.6	458.6	509.6	514.6	519.6
TOTAL	264.7	308.2	420.1	442.6	476.6	580.5	540.9	567.2	697.7	698.4	746.2	743.3	723.7

\*) estimated

09/MST/W/6

Energy & Load Demand Forecast  
 PLN Region: VI - Banjar Baru ( High )

DKL 2.0

Fiscal Year	1980*	1981*	1982	1983	1984	1985	1986	1987	1988	1989	2000	2001	2002	2003
<b>Residential</b>														
Population(10 <sup>3</sup> )	5870.6	6059.6	6253.4	6450.5	6646.4	6843.6	7044.5	7250.7	7451.5	7652.0	7851.2	8050.2	8248.5	8447.3
Growth Rate(%)	3.4	3.2	3.2	3.2	3.0	2.9	2.9	2.9	2.8	2.7	2.5	2.5	2.4	2.4
Electric Rate(%)	25.8	32.2	35.2	38.5	41.7	44.9	48.0	51.1	54.2	57.2	60.2	63.2	66.2	69.1
No. of Customers(10 <sup>3</sup> )	336.0	380.8	440.8	480.8	534.7	591.8	651.8	714.7	780.7	850.0	917.7	981.3	1048.8	1122.8
Power Contracted(MVA)	680.8	860.7	882.3	882.8	882.3	882.1	882.1	881.7	881.7	881.6	881.5	881.4	881.3	881.2
Power Contracted(MVA)	222.1	243.3	282.3	328.3	387.5	446.1	480.5	534.5	579.5	625.7	673.1	721.7	771.5	821.5
Growth of GDP Tot(%)	6.58	6.17	6.17	6.11	5.77	5.87	5.85	5.85	5.82	5.89	5.87	5.84	5.83	5.80
Consump./Cust.(kwh)	878.5	834.8	748.6	717.9	713.0	715.5	720.5	727.5	736.2	746.9	756.3	773.3	786.5	798.6
Energy Consump.(GWh)	300.1	326.1	330.5	358.8	385.5	438.3	484.3	533.8	587.4	644.9	709.5	772.7	843.9	920.4
Growth (%)	14.8	8.7	1.3	7.8	10.9	10.8	10.5	10.3	10.0	9.8	9.6	9.4	9.2	9.1
Share to Total (%)	40.2	35.2	33.0	30.6	30.4	29.0	28.9	28.8	28.8	28.8	28.8	28.8	28.7	28.4
<b>Commercial</b>														
No. of Customers	17000	18725	24331	27428	30023	33633	37361	40810	44587	48358	52220	56182	60244	64413
Customer Ratio to Res.	0.05	0.08	0.08	0.09	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.08
Elasticity	0.8	0.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of Gdp Sec.(%)	6.00	6.03	6.05	6.08	6.10	6.14	6.18	6.22	6.26	6.30	6.34	6.38	6.42	6.46
Power Contr./Cust.(VA)	3133.2	3088.6	2808.7	2809.0	2809.1	2809.2	2809.2	2809.2	2809.3	2809.4	2809.4	2809.4	2809.5	2809.5
Power Contracted(MVA)	53.3	61.8	88.3	77.0	88.0	85.3	105.0	114.9	125.3	135.8	146.7	157.5	169.3	181.0
Consump./Cust.(kwh)	3681.6	3778.8	3058.0	3113.4	3185.0	3163.8	3244.3	3305.5	3378.5	3458.5	3550.8	3653.5	3789.2	3888.8
Energy Consump.(GWh)	82.6	74.5	78.1	65.4	86.6	109.4	121.2	135.2	150.5	167.2	185.4	205.3	228.9	250.5
Growth (%)	21.4	19.0	0.9	13.7	13.1	12.2	11.8	11.6	11.3	11.1	10.9	10.7	10.5	10.4
Share to Total (%)	5.4	6.0	7.5	7.3	7.4	7.2	7.3	7.3	7.4	7.5	7.6	7.7	7.7	7.7
<b>Public &amp; Others</b>														
No. of Customers	12924	14415	18031	20328	22684	25147	27688	30918	33043	35838	38689	41638	44846	47736
Customer Ratio to Res.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Elasticity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Power Contr./Cust.(VA)	4027.3	4035.3	4103.8	4104.8	4104.4	4103.8	4103.3	4103.3	4103.0	4102.8	4102.6	4102.4	4102.3	4102.1
Power Contracted(MVA)	51.8	53.8	74.0	83.4	83.1	103.2	113.8	124.4	135.8	147.0	158.5	170.9	183.2	195.8
Consump./Cust.(kwh)	6455.8	6014.8	5890.5	5885.2	5976.8	5825.8	6025.8	6076.7	6143.8	6226.2	6329.5	6443.7	6573.0	6715.8
Energy Consump.(GWh)	82.8	84.7	107.8	121.3	135.7	160.7	168.8	194.2	203.0	223.2	244.9	268.3	283.9	320.8
Growth (%)	11.3	4.7	24.4	12.4	11.8	11.0	10.7	10.4	10.2	9.8	9.7	9.5	9.4	9.2
Share to Total (%)	11.1	10.4	10.6	10.4	10.4	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.8
<b>Industry</b>														
No. of Customers	1012	1088	972	1029	1089	1150	1215	1285	1356	1432	1513	1588	1688	1783
Elasticity	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Growth of Gdp Sec.(%)	16.72	6.94	6.94	6.31	6.32	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05	6.05
Power Contr./Cust.(VA)	140216.4	142795.1	159141.6	184283.5	188028.8	178594.4	181634.4	186437.7	187411.8	203451.0	211895.9	220501.7	229895.8	230807.3
Power Contracted(MVA)	141.8	155.4	154.7	160.0	164.8	201.8	200.9	241.8	265.3	291.3	320.2	352.4	386.1	427.9
Energy Ind. Demand(GWh)	1321.8	1617.2	1718.4	1818.4	1824.2	2032.6	2147.2	2288.2	2366.1	2531.2	2873.8	3242.7	3654.1	4152.5
Energy Big Cust.(GWh)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capitive Power (GWh)	1221.2	1275.4	1230.0	1215.5	1252.8	1229.3	1251.5	1272.9	1297.4	1328.3	1380.0	1385.2	1405.7	1398.1
Capitive Takeover(GWh)	0.0	0.0	0.0	88.1	33.7	93.8	47.1	48.1	47.2	42.3	43.2	50.5	56.7	66.8
Share PLN to Tot.(%)	18.76	21.26	26.42	33.15	34.80	38.92	41.72	43.89	45.85	47.52	49.14	50.93	52.69	55.83
Energy Consump.(GWh)	306.7	343.8	488.3	602.8	671.6	803.4	895.7	998.3	1098.9	1202.9	1313.9	1436.5	1576.4	1754.3
Growth (%)	10.8	14.3	42.0	23.5	11.4	16.8	11.5	11.1	10.4	9.5	9.2	8.5	8.7	11.1
Share to Total (%)	40.3	41.4	46.7	51.7	51.7	53.5	53.7	55.6	53.8	53.7	53.6	53.6	53.6	54.0
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	38816	4253	4841	5450	6061	6749	7430	8126	8867	9616	10364	11171	11976	12805
Power Contracted(MVA)	486.6	514.3	569.4	558.8	571.5	607.5	637.5	671.8	700.3	735.7	781.4	834.1	892.2	958.2
Energy Consump.(GWh)	746.2	831.1	1001.8	1166.0	1289.5	1500.7	1686.0	1848.7	2036.7	2238.2	2450.8	2684.8	2942.7	3245.5
Growth Rate(%)	13.3	11.4	20.3	12.4	11.4	15.5	11.2	10.8	10.3	9.7	9.5	9.5	9.3	10.3
T & D Losses (%)	9.3	8.3	8.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Energy Sent Out(GWh)	825.1	918.9	1108.4	1285.0	1432.0	1633.8	1838.2	2037.3	2247.7	2469.5	2700.8	2953.7	3242.9	3577.0
Plant Use (%)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Production (GWh)	851.1	947.8	1141.1	1325.4	1477.0	1695.7	1910.3	2101.3	2318.6	2544.0	2785.6	3051.7	3344.3	3689.3
Load Factor (%)	86.0	57.3	56.6	60.5	60.9	61.8	62.2	62.5	62.8	63.0	63.3	63.8	64.2	64.2
Peak Load (MW)	142.9	188.8	218.6	250.0	278.8	315.1	348.2	383.3	421.5	460.7	502.1	540.1	586.1	633.9

M E I 1992  
 DKL DIVIS/055

\* Actual # Estimated  
 +) Losses to production

DEMAND AND SUPPLY  
PLN REGION VII

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
1. Sales	268.2	300.9	337.5	377.4	421.5	470.5	524.8	584.9	651.5	724.9	806	895.2	993.4
Increase	12.1	12.2	12.2	11.8	11.7	11.6	11.5	11.5	11.4	11.3	11.2	11.1	11.0
2. Losses T & D	56.1	60.7	65.5	70.6	75.8	81.2	86.9	92.9	98.9	105.2	111.6	118.0	124.5
	16.9	16.4	15.9	15.4	14.9	14.4	13.9	13.4	12.9	12.4	11.9	11.4	10.9
3. Sent Out Energy	324.3	361.6	403.0	448.0	497.3	551.7	611.7	677.8	750.4	830.1	917.6	1013.2	1117.9
4. Station Use	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5. Gross Generation	332.7	370.9	413.5	459.6	510.2	566.0	627.6	695.4	769.9	851.7	941.4	1039.5	1146.9
6. System Peak	90.1	100.1	111.2	123.2	136.3	150.6	166.7	184.2	203.4	224.5	247.6	272.9	300.5
7. System LF	42	42	42	43	43	43	43	43	43	43	43	43	44
Supply													
Existing	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.7	1.7	1.7	1.7	1.6
Minihydro													
Hydro	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.4	32.3	32.3
Diesel	120.3	120.3	119.0	118.5	118.1	108.9	104.9	100.1	98.3	87.2	77.4	63.9	62.9
Sub-total	154.6	154.6	153.3	152.8	152.4	143.2	139.2	134.4	132.4	121.3	111.5	97.9	96.8
Ongoing													
Lahendong, GEPP		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Committed			20	20	20	20	20	20	20	20	20	20	20
Lahendong, GEPP													
Planned													
Mini Hydro				5.9	5.9	12.3	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Tanggari II, HEPP				19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Palu III, HEPP										76	76	76	76
Polgar II, HEPP								16.0	16.0	16.0	16.0	16.0	16.0
Polgar III, HEPP								13.4	13.4	13.4	13.4	13.4	13.4
Bitung #1-4, GTPP								50	75	75	75	100	100
Diesel		12.5	30.5	40.5	43.5	44.5	68.5	70	75	78	81	84	87
Sub. Total		12.5	30.5	65.4	68.4	75.8	104.5	185.4	215.4	294.4	297.4	325.4	328.4
TOTAL	154.6	169.6	206.3	240.7	243.3	241.5	266.2	342.3	370.3	438.2	431.4	445.8	447.7

\*) estimated

09/MST/W7



Energy & Load Demand Forecast  
 PLN Reglbr: VII - Manado ( HIGH)

DKL 2.0

Fiscal Year:	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>3</sup> )	4180.1	4275.7	4392.0	4447.6	4530.8	4612.5	4694.6	4777.7	4854.9	4932.1	5000.5	5086.1	5132.5	5183.3
Growth Rate (%)	2.1	2.0	2.0	1.8	1.8	1.8	1.8	1.8	1.8	1.5	1.4	1.4	1.3	1.2
Electr. Ratio (%)	32.9	34.3	36.6	39.5	42.5	45.5	48.7	52.0	55.4	59.1	62.8	66.3	70.2	74.2
No. of Customers (10 <sup>3</sup> )	276.0	320.4	319.4	351.2	384.7	420.0	457.2	488.8	528.1	561.1	595.8	626.1	720.3	770.3
Power Contr./Cust. (VA)	516.7	520.6	523.3	524.8	527.0	528.1	530.6	535.2	538.3	544.8	550.8	558.8	537.3	536.5
Power Contracted (MVA)	143.2	153.7	159.8	164.3	202.7	222.1	242.6	264.3	287.1	310.8	335.3	360.3	367.3	414.8
Growth of GDP Tot. (%)	5.86	5.81	5.88	5.89	5.84	5.70	5.69	5.68	5.68	5.67	5.68	5.85	5.83	5.82
Consump./Cust. (kwh)	562.4	549.7	547.1	551.7	538.2	563.1	571.5	581.4	592.8	605.9	621.2	638.4	657.3	678.1
Energy Consump. (GWh)	144.3	181.3	174.8	183.8	214.0	238.5	281.3	288.7	318.9	352.1	388.8	428.1	473.5	522.3
Share to Total (%)	15.5	11.8	8.3	10.9	10.4	10.5	10.5	10.5	10.3	10.4	10.4	10.4	10.3	10.3
	59.5	58.7	58.1	57.4	58.7	58.1	55.5	55.0	54.5	54.0	53.8	53.2	52.9	52.8
<b>Commercial</b>														
No. of Customers	6453	10381	11041	12141	13257	14518	15806	17195	18600	20088	21832	23235	24888	26628
Customer Ratio to Res.	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Elasticity	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of GDP Sec. (%)	6.02	6.03	6.03	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04
Power Contr./Cust. (VA)	2392.8	2370.8	2395.7	2393.3	2286.7	2284.8	2291.0	2287.7	2284.8	2282.2	2278.8	2277.8	2276.0	2274.3
Power Contracted (MVA)	283.8	286.8	285.5	280.0	306	333	362	393	42.5	45.6	49.3	52.9	56.7	60.8
Consump./Cust. (kwh)	2831.8	2869.5	2789.4	2840.7	2958.2	2960.9	3022.2	3088.8	3180.7	3240.1	3328.7	3420.3	3520.8	3626.4
Energy Consump. (GWh)	717.9	801.1	741.5	784.5	838.6	843.0	878	930	988	1041	1100	1164	1233	1306
Share to Total (%)	17.9	21.0	21	12.2	12.0	11.3	11.1	11.0	10.9	10.7	10.6	10.4	10.3	10.2
	10.3	10.9	10.2	10.2	10.2	10.2	10.2	10.1	10.1	10.0	9.9	9.8	9.8	9.7
<b>Public &amp; Others</b>														
No. of Customers	8005	8581	10881	11985	13105	14308	15378	16917	18331	19768	21320	22889	24538	26242
Customer Ratio to Res.	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Elasticity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Power Contr./Cust. (VA)	3635.4	3071.2	2863.3	2853.1	2844.1	2836.2	2829.2	2822.9	2817.3	2812.3	2803.6	2803.6	2803.6	2807.0
Power Contracted (MVA)	3789.9	3725.1	3817.8	3854.4	3889.4	3934.4	3970.5	4022.4	4074.6	4134.7	4202.1	4278.6	4357.5	4444.9
Energy Consump. (GWh)	33.9	35.7	41.5	46.1	51.1	56.3	61.9	68.0	74.7	81.9	89.9	97.9	106.8	116.6
Share to Total (%)	8.0	8.3	19.4	11.0	10.8	10.2	10.0	9.8	9.8	9.8	9.4	9.3	9.2	9.1
	14.0	13.0	13.8	13.7	13.5	13.4	13.2	13.0	12.8	12.8	12.4	12.2	11.9	11.7
<b>Industry</b>														
No. of Customers	542	593	595	648	702	780	824	893	968	1048	1136	1231	1334	1448
Customer Ratio to Res.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Elasticity	11.14	9.28	9.29	8.64	8.64	8.39	8.38	8.38	8.38	8.38	8.38	8.38	8.38	8.38
Growth of GDP Sec. (%)	52847.8	62391.8	55350.5	54035.7	54875.3	55391.5	56242.2	57228.2	58353.0	59220.8	61036.5	62805.8	64333.1	66231.5
Power Contr./Cust. (VA)	151.3	154.1	160.7	166.3	178.2	193.1	204.4	213.1	224.0	238.5	248.2	274.1	288.4	308.3
Power Contracted (MVA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Incl. Demand (GWh)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Big Cust. (GWh)	112.0	108.3	126.6	133.2	139.5	145.3	150.8	156.3	161.4	166.2	170.8	174.8	178.2	181.4
Capita Power (GWh)	0.0	0.0	0.0	0.0	0.2	0.9	0.5	0.7	0.8	0.7	0.5	0.2	0.2	0.2
Capita Takeover (GWh)	25.98	31.02	28.82	32.14	34.59	37.11	39.73	42.40	45.11	47.84	50.59	53.32	56.04	58.71
Share PLN to Tot. (%)	14.5	14.5	12.7	17.1	16.8	16.3	16.0	15.8	15.3	14.9	14.6	14.2	13.9	13.5
Energy Consump. (GWh)	16.2	17.4	17.8	18.7	19.5	20.3	21.1	21.9	22.7	23.4	24.1	24.7	25.4	26.0
Share to Total (%)	285.0	314.0	341.8	376.0	411.9	448.6	486.4	521.5	578.0	632.1	685.6	719.5	771.0	824.2
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	285.0	314.0	341.8	376.0	411.9	448.6	486.4	521.5	578.0	632.1	685.6	719.5	771.0	824.2
Power Contracted (MVA)	242.4	274.9	300.9	327.4	377.4	421.5	470.5	524.8	584.8	651.5	724.8	808.0	893.2	983.4
Energy Consump. (GWh)	14.8	13.4	18.5	21.1	25.2	28.5	31.8	35.1	38.3	42.6	46.3	50.5	54.7	59.0
Growth Rate (%)	17.3	18.5	18.3	15.8	15.3	14.9	14.3	13.8	13.3	12.8	12.3	11.8	11.3	10.8
T & D Losses (%)	294.7	332.1	367.3	403.0	447.9	497.2	551.8	611.8	677.7	750.3	830.0	917.4	1013.1	1117.8
Energy Sent Out (GWh)	2.8	2.8	2.8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Plant Use (%)	302.5	340.8	370.8	413.5	458.8	510.2	568.0	627.8	693.4	769.8	851.7	941.4	1039.5	1148.9
Production (GWh)	43.1	42.4	43.5	42.4	42.0	42.7	42.9	43.0	43.1	43.2	43.3	43.4	43.5	43.8
Load Factor (%)	80.2	86.7	97.3	111.2	123.2	130.3	150.8	189.7	184.2	203.4	224.5	247.6	272.9	300.5
Peak Load (MW)														

DKL DIVSIS/RS5

MEI 1992

\* Actual # Estimated  
 +) Losses to production

DEMAND AND SUPPLY  
PLN REGION VIII

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03
<b>Demand</b>												
1. Sales	598.8	689.9	935.0	1029.7	1309.5	1440.8	1585.4	1730.1	1883.4	2049.7	2230.7	2429.0
Increase	11.4	15.2	35.5	10.1	27.2	10.0	10.0	9.1	8.9	8.8	8.8	8.9
2. Losses T & D	125.5	139.5	182.1	193.0	236.0	249.4	263.2	275.2	286.6	298.0	309.3	320.6
(%)	16.8	16.3	15.8	15.3	14.8	14.3	13.8	13.3	12.8	12.3	11.8	11.3
3. Sent Out Energy	724.4	829.3	1117.1	1222.7	1545.4	1690.1	1848.6	2005.3	2170.0	2347.6	2540.0	2749.6
(GWh)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
4. Station Use	747.0	855.3	1152.0	1261.0	1593.8	1743.0	1906.5	2068.0	2237.8	2421.1	2619.4	2835.6
(GWh)	159.3	179.7	226.4	247.9	301.2	329.1	359.7	389.7	420.6	454.1	490.2	529.6
5. System Peak	54	54	58	58	60	60	61	61	61	61	61	61
(MW)												
6. System LF												
(%)												
7. System LF												
(MW)												
<b>Supply</b>												
Existing	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Mini Hydro	126.0	126.0	126.0	126.0	126.0	126.0	126.0	126.0	126.0	126.0	126.0	126.0
Hydro	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Steam Oil	35.8	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4
GTPP	147.47	147.22	141.5	141.4	140.73	138.9	136.47	133.88	131.47	129.77	114.92	109.95
Diesel	336.0	321.3	315.6	315.5	314.8	288.0	285.5	282.9	259.2	257.5	242.6	237.7
Sub. Total												
Ongoing												
<b>Committed Projects</b>												
<b>Planned Projects</b>												
Minihydro	-	-	-	4.2	4.2	5.7	5.7	9.2	9.2	9.2	9.2	9.2
Bakaru II, HEPP	-	-	-	-	-	-	-	126.0	126.0	126.0	126.0	126.0
Malea, HEPP	-	-	-	-	-	-	-	-	-	-	184.0	184.0
Bili-Bili, HEPP	-	-	-	-	-	-	-	-	16.2	16.2	16.2	16.2
U.Pandang, GTPP	-	-	-	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
U.Pandang # 1-2, STCFPP	-	-	-	-	-	-	65.0	130.0	130.0	130.0	130.0	130.0
Diesel	-	8.0	13.0	18.3	21.8	31.3	35.5	38	43	45	50	52
Sub. Total	-	8.0	13.0	52.5	86.0	97.0	166.2	363.2	384.4	386.4	575.4	577.4
<b>TOTAL</b>	336.0	329.3	328.6	368.0	400.8	385.0	451.7	646.1	643.6	643.9	816.0	815.1

Energy & Load Demand Forecast  
 PLN Region: VIII - Ujung Pandang ( HIGH )

DKL2.0

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>3</sup> )	8331.3	8477.0	8623.8	8767.9	8905.2	9041.4	9179.3	9318.7	9451.5	9578.1	9699.8	9815.8	9925.4	10036.1
Growth Rate (%)	1.9	1.7	1.7	1.7	1.6	1.5	1.5	1.5	1.4	1.3	1.3	1.2	1.1	1.1
Elect. Ratio (%)	26.4	30.6	34.5	37.9	41.8	45.4	48.4	50.7	52.2	52.8	53.5	54.0	54.5	54.9
No. of Customers (10 <sup>3</sup> )	473.7	518.3	584.7	665.3	740.4	821.1	907.7	1000.8	1100.8	1205.5	1315.5	1431.0	1552.2	1678.6
Power Contracted (MVA)	520.5	520.5	507.1	508.4	508.5	511.4	512.2	511.4	512.2	512.8	513.5	514.0	514.9	514.9
Power Contracted (MW)	248.8	272.8	300.8	337.3	378.4	416.4	463.4	511.8	563.7	616.3	675.5	735.5	796.8	864.8
Growth of GDP Tot (%)	8.43	8.48	8.42	8.47	8.02	8.44	8.43	8.41	8.40	8.38	8.37	8.35	8.30	8.28
Share of GDP Tot (%)	48.4	51.47	47.20	46.54	45.77	45.03	44.48	43.98	42.66	41.58	40.84	39.98	39.08	38.24
Consump./Cust. (kwh)	229.2	269.8	260.7	309.9	369.9	440.2	469.0	440.2	469.0	501.4	554.7	606.7	645.2	685.2
Energy Consump. (GWh)	12.8	18.4	5.2	10.3	8.5	8.2	8.1	8.0	8.8	8.7	8.8	8.8	8.4	8.4
Growth (%)	43.1	43.8	40.7	33.1	32.8	28.3	28.0	27.8	27.2	26.5	26.1	25.5	25.0	24.4
Share to Total (%)														
<b>Commercial</b>														
No. of Customers	15444	17421	20135	22525	25070	27602	30798	33885	37287	40816	44541	48452	52537	56871
Customer Ratio to Res.	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Elasticity	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of Gdp Sec (%)	5.77	5.80	5.82	5.83	5.87	5.43	5.46	5.48	5.50	5.53	5.55	5.58	5.62	5.62
Power Contract. (MVA)	2771.7	2726.8	2598.0	2497.3	2487.4	2478.8	2471.3	2484.7	2458.8	2448.2	2445.2	2441.7	2438.5	2438.5
Power Contract. (MW)	42.5	51.1	50.5	50.3	50.4	50.8	50.8	50.8	50.8	50.2	50.1	50.1	50.3	50.3
Consump./Cust. (kwh)	3188.5	3428.0	3121.3	3151.5	3181.1	3221.8	3258.0	3302.0	3350.4	3407.8	3473.4	3546.8	3626.0	3718.6
Energy Consump. (GWh)	48.4	58.7	62.8	71.0	80.0	88.9	100.2	111.9	124.8	136.1	154.7	171.9	190.7	211.4
Growth (%)	14.1	20.8	5.3	13.0	12.7	11.8	11.8	11.7	11.6	11.4	11.2	11.1	11.0	10.8
Share to Total (%)	9.2	8.8	8.1	7.8	7.8	6.8	7.0	7.1	7.2	7.4	7.5	7.7	7.8	8.0
<b>Public &amp; Others</b>														
No. of Customers	10930	11714	14048	15715	17481	19387	21444	23641	26001	28477	31078	33804	36888	39878
Customer Ratio to Res.	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Elasticity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Power Contract. (MVA)	5097.9	5103.3	5191.0	5284.4	5371.5	5503.8	5592.1	5676.0	5760.0	5838.3	5918.1	5990.0	6065.2	6140.5
Power Contract. (MW)	55.4	53.7	52.8	52.3	52.2	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8
Consump./Cust. (kwh)	7417.6	7138.8	7048.8	7044.2	7058.4	7057.5	7088.1	7082.0	7125.0	7175.1	7240.2	7316.2	7411.1	7512.0
Energy Consump. (GWh)	81.1	83.8	99.0	110.7	123.9	138.8	151.6	167.7	185.3	204.3	228.0	247.4	271.8	298.2
Growth (%)	2.4	3.1	19.5	11.8	11.5	10.9	10.7	10.8	10.5	10.3	10.1	10.0	9.7	9.7
Share to Total (%)	15.0	13.7	14.4	11.6	12.0	10.5	10.5	10.6	10.7	10.8	11.0	11.1	11.2	11.3
<b>Industry</b>														
No. of Customers	1000	1078	1293	1372	1500	1638	1784	1945	2121	2313	2522	2751	3000	3272
Elasticity	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Growth of Gdp Sec (%)	10.85	8.12	6.13	6.48	8.48	8.22	8.22	8.22	8.22	8.23	8.23	8.23	8.23	8.23
Power Contract. (MVA)	83854.0	89139.1	90860.0	104888.2	149008.9	203197.8	242355.6	286416.6	338110.0	392708.8	453100.0	514140.0	583921.0	663921.0
Power Contract. (MW)	63.7	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9	63.9
Energy Ind. Demand (GWh)	587.2	624.1	686.7	760.8	821.0	885.2	978.2	1084.5	1180.5	1285.8	1380.4	1484.2	1584.2	1684.2
Energy Big Cust. (GWh)	0	0	44	189.80	0	210.24	0	0	0	0	0	0	0	0
Captive Power (GWh)	587.4	425.8	438.4	307.2	338.6	162.2	190.8	198.7	210.8	227.2	248.3	263.7	281.7	303.8
Captive Takeover (GWh)	0.0	0.0	0.0	2.4	3.2	7.7	7.9	8.3	8.1	2.5	2.7	3.5	8.9	3.7
Share PLN to Tot. (%)	31.7	31.8	36.0	39.1	36.4	78.7	80.5	81.3	81.6	82.1	82.2	82.5	82.8	83.0
Energy Consump. (GWh)	179.7	189.3	247.3	443.7	487.3	713.0	795.4	885.7	930.1	1038.8	1153.3	1241.8	1359.8	1488.8
Growth (%)	17.1	10.3	24.7	79.4	9.8	46.3	10.1	10.2	9.7	8.3	9.3	9.4	8.5	9.3
Share to Total (%)	33.3	32.6	33.8	47.5	47.3	54.5	54.5	54.8	54.8	55.1	55.4	55.7	56.0	56.3
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	501.1	548.8	630.1	704.8	764.5	870.0	891.7	1090.2	1182.0	1277.1	1385.6	1515.0	1644.5	1778.5
Power Contracted (MVA)	438.4	473.4	538.2	608.1	654.5	722.5	760.2	1000.2	1094.0	1178.2	1274.0	1378.8	1480.8	1610.7
Energy Consump. (GWh)	538.3	608.4	686.9	835.0	1029.7	1308.8	1440.8	1585.4	1730.1	1863.4	2048.7	2230.7	2428.0	2641.8
Growth Rate (%)	12.7	12.8	13.4	15.8	15.3	14.8	14.3	14.3	13.3	12.8	12.3	11.8	11.3	10.9
Y & D Losses (%)	16.5	17.3	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
Energy Sent Out (GWh)	685.7	739.4	833.2	1117.4	1223.1	1346.0	1690.7	1846.3	2006.0	2170.7	2348.4	2540.8	2742.9	2942.2
Plant Use (%)	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Production (GWh)	693.9	759.3	855.9	1132.0	1261.0	1393.8	1743.0	1908.1	2068.1	2237.9	2421.1	2619.4	2835.8	3066.2
Load Factor (%)	52.3	52.1	53.3	56.1	58.1	60.4	60.5	60.5	60.5	60.7	60.8	61.0	61.1	61.2
Peak Load (MW)	148.8	186.5	183.2	228.3	247.9	301.2	329.1	359.7	388.7	420.8	454.1	490.2	528.5	571.8

DKL DIVSIS/655

M.EI 1992

\* Actual # Estimated  
 +1. Losses to production

DEMAND AND SUPPLY  
PLN REGION IX

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
1. Sales	108.0	122.3	137.6	154.1	172.3	192.2	214.0	237.9	263.9	292.5	323.7	357.9	395.2
Increase	12.7	13.2	12.5	12.0	11.8	11.5	11.3	11.2	10.9	10.8	10.7	10.6	10.4
2. Losses T & D	25.9	27.9	30.4	32.8	35.4	38.1	40.8	43.5	46.5	49.3	52.4	55.3	58.4
(%)	18.3	17.8	17.3	16.8	16.3	15.8	15.3	14.8	14.3	13.8	13.3	12.8	12.3
3. Sent Out Energy	133.9	150.2	168.0	186.9	207.7	230.3	254.8	281.4	310.4	341.8	376.1	413.2	453.6
(%)	4.2	4.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
4. Station Use	139.7	156.7	175.3	195.1	216.8	240.3	265.9	293.7	323.9	356.7	392.4	431.2	473.3
(GWh)	34.7	38.6	43.3	48.1	53.3	59.0	65.1	71.8	79.1	87.1	95.7	105.1	115.3
(MW)	46	46	46	46	46	46	47	47	47	47	47	47	47
5. System Peak													
6. System LF													
7. System LF													
Supply													
Existing													
Diesel	65.04	64.04	64.04	63.70	63.70	63.70	57.36	56.37	56.37	56.37	55.09	54.25	41.79
Ongoing Projects													
Committed Projects													
Planned Projects													
Mini Hydro	-	-	-	-	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Isai-2, HEPP	-	-	-	-	-	-	-	-	-	20.0	20.0	20.0	60.0
GTPP	-	-	-	-	-	-	-	-	20.0	20.0	20.0	20.0	20.0
Diesel	-	1	2	3.5	5.3	14.8	15.5	18.5	20.5	22.5	27.5	29.5	32.5
Sub-total	-	1.0	2.0	3.5	5.3	15.8	16.5	19.5	41.5	63.5	68.5	70.5	113.5
Total	65.0	65.0	66.0	67.2	69.0	79.5	73.9	75.9	97.9	119.9	124.6	124.8	155.3

SPINSTAT99

Energy & Load Demand Forecast  
 PLN Region: IX - Maluku ( HIGH )

DKL2.0

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Residential	1850.1	1905.3	1955.4	2005.7	2051.1	2099.3	2147.0	2195.5	2240.7	2288.2	2331.5	2378.9	2421.1	2465.7
Population (10 <sup>^3</sup> )	2.3	2.7	2.8	2.5	2.4	2.3	2.3	2.3	2.1	2.0	2.0	1.9	1.9	1.8
Growth Rate (%)	23.3	25.0	30.3	33.6	37.0	40.3	43.6	46.9	50.1	53.4	56.5	59.7	62.8	65.9
Electr. Ratio (%)	80.5	95.1	118.4	134.8	151.8	169.3	187.4	205.8	224.0	242.0	260.7	279.3	304.3	325.2
No. of Customers (10 <sup>^3</sup> )	601.2	584.7	568.1	570.3	573.8	578.3	578.6	580.5	582.2	583.0	584.8	586.9	588.5	587.7
Power Contr./Cust. (VA)	50.4	55.1	67.0	76.9	87.1	97.8	108.4	119.5	130.8	142.4	154.2	166.2	178.5	191.1
Power Contracted (MVA)	8.35	8.26	8.23	6.22	5.87	6.12	6.11	6.10	6.09	6.08	6.09	6.05	6.02	6.01
Growth of GDP Tot. (%)	590.3	628.9	588.2	557.3	548.5	548.6	551.3	556.1	568.0	580.8	598.5	614.9	635.4	656.5
Consump./Cust. (kwh)	54.3	59.6	67.3	75.1	83.4	92.9	103.3	114.9	127.8	141.7	157.3	174.4	193.3	214.2
Energy Consump. (GWh)	15.7	17.1	12.6	11.7	11.4	11.4	11.3	11.2	11.1	11.0	11.0	10.9	10.8	10.8
Growth (%)	54.8	55.1	55.0	54.8	54.1	53.9	53.8	53.7	53.7	53.7	53.8	53.9	54.0	54.2
Share to Total. (%)														
Commercial	4279	4371	8704	7836	6598	8599	10814	11661	12729	13621	14534	16072	17234	18421
No. of Customers	0.06	0.05	0.00	0.08	0.08	0.08	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Customer Ratio to Res.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Elasticity	5.85	5.98	5.86	5.87	5.98	5.42	5.43	5.43	5.44	5.45	5.48	5.48	5.47	5.46
Growth of GDP Sec. (%)	2580.0	2533.6	2202.8	2232.9	2257.2	2277.1	2283.8	2307.8	2318.8	2330.1	2339.0	2349.3	2353.8	2360.0
Power Contr./Cust. (VA)	11.0	11.8	14.8	17.1	19.4	21.8	24.3	26.9	29.5	32.2	34.9	37.7	40.8	43.5
Power Contracted (MVA)	2592.7	2586.3	2037.7	2018.3	2010.9	2004.8	2006.0	2015.2	2031.0	2052.8	2078.9	2111.9	2148.5	2189.4
Consump./Cust. (kwh)	11.1	11.2	13.7	15.4	17.3	18.2	21.3	23.5	25.9	28.4	31.1	33.9	37.0	40.3
Energy Consump. (GWh)	19.8	19.8	21.7	12.6	12.2	11.2	10.9	10.4	10.0	9.7	9.5	9.3	9.1	8.9
Growth (%)	11.2	10.4	11.2	11.2	11.2	11.2	11.1	11.0	10.9	10.7	10.6	10.5	10.3	10.2
Share to Total. (%)														
Public & Others	3377	3453	4834	5278	5942	6628	7337	8060	8789	8553	10323	11110	11913	12733
No. of Customers	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Customer Ratio to Res.	0.7	0.1	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Elasticity	3728.6	3732.1	3529.5	3572.3	3508.6	3634.9	3656.6	3678.5	3695.4	3710.0	3722.5	3733.6	3743.2	3752.4
Power Contr./Cust. (VA)	12.8	13.3	18.4	18.9	21.4	24.1	26.8	29.8	32.3	35.4	38.4	41.5	44.5	47.8
Power Contracted (MVA)	4354.5	4807.4	3918.8	3919.0	3745.0	3879.9	3927.4	3590.2	3587.4	3549.3	3542.4	3542.9	3550.0	3563.0
Consump./Cust. (kwh)	14.7	16.6	18.2	20.2	22.3	24.4	26.8	28.9	31.4	33.6	36.8	39.4	42.3	45.4
Energy Consump. (GWh)	18.3	18.3	11.1	10.4	10.4	9.8	9.1	8.7	8.4	8.1	7.8	7.8	7.4	7.3
Growth (%)	14.9	15.3	14.8	14.7	14.4	14.2	13.8	13.5	13.2	12.6	12.5	12.2	11.8	11.5
Share to Total. (%)														
Industry	185	182	186	200	215	232	249	267	287	309	332	357	383	412
No. of Customers	0.8	0.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Elasticity	12.00	10.00	10.00	9.30	8.30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Growth of GDP Sec. (%)	58745.5	58270.3	58788.4	55705.3	55080.0	54054.2	54413.9	54501.8	54684.1	55580.4	56614.2	58013.7	59811.8	62047.0
Power Contr./Cust. (VA)	153.4	152.2	182.3	194.4	211.6	227.4	244.3	262.9	282.2	303.3	325.9	350.3	376.5	404.8
Power Contracted (MVA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Ind. Demand (GWh)	136.8	135.4	189.1	188.5	180.4	181.5	203.3	215.8	229.2	243.3	256.4	274.3	291.2	308.2
Energy Big Cust. (GWh)	0.0	0.0	0.0	1.9	2.2	2.3	2.5	2.6	2.8	3.0	3.2	3.4	3.8	4.3
Capitive Power (GWh)	12.15	13.31	12.72	13.69	14.73	15.78	16.78	17.79	18.78	19.78	20.73	21.69	22.64	23.58
Share PLN to Tot. (%)	94.8	10.2	11.5	18.0	15.9	15.0	14.4	13.9	13.5	13.1	12.7	12.4	12.2	11.9
Energy Consump. (GWh)	18.1	18.2	19.0	18.5	20.2	20.8	21.3	21.6	22.3	22.7	23.1	23.5	23.8	24.1
Growth (%)														
Share to Total. (%)														
Total	843	902	1289	1478	1665	1857	2058	2259	2468	2677	2893	3113	3338	3558
No. of Customers (10 <sup>^3</sup> )	83.7	90.2	108.7	126.8	139.8	158.1	173.2	190.7	208.7	227.2	246.4	265.6	284.8	303.9
Power Contracted (MVA)	88.8	108.2	123.3	137.6	154.1	172.3	192.2	214.0	237.8	263.9	292.0	323.7	357.9	395.2
Energy Consump. (GWh)	28.4	31.0	33.0	32.5	32.0	31.8	31.8	31.3	31.1	30.8	30.6	30.3	30.1	30.0
Growth Rate (%)	28.4	9.4	13.0	12.5	12.0	11.8	11.8	11.3	11.1	10.8	10.6	10.3	10.3	10.4
T. & O. Losses (%)	122.8	133.3	149.8	167.6	186.8	207.5	230.1	254.8	281.2	310.1	341.5	375.7	412.5	453.2
Energy Sent Out (GWh)	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Plant Use (%)	128.2	139.2	158.2	175.3	195.1	218.7	240.3	265.9	293.9	323.9	356.7	392.4	431.1	473.3
Production (GWh)	47.2	47.2	47.2	48.2	48.3	48.4	48.5	48.8	48.7	48.7	48.9	48.8	48.8	48.9
Load Factor (%)	31.0	33.8	37.6	43.3	48.1	53.3	58.0	65.1	71.8	78.1	87.1	95.7	105.1	115.3
Peak Load (MW)														

DKL DIVIS/D55

MEI 1992

\* Actual # Estimated  
 +) Losses to production

DEMAND AND SUPPLY  
PLN REGION X

	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
1. Sales	109.0	117.8	129.4	142.0	155.8	170.2	186.1	203.3	222.0	242.3	264.3	288.3	314.4
Increase	10.7	8.1	9.8	9.7	9.7	9.2	9.3	9.2	9.2	9.1	9.1	9.1	9.1
2. Losses T & D	22.8	23.6	25.6	27.1	28.2	29.8	31.4	32.9	34.3	35.8	37.3	38.7	40.1
(%)	16.6	16.1	15.9	15.4	14.9	14.4	13.9	13.4	12.9	12.4	11.9	11.4	10.9
3. Sent Out Energy	131.7	141.4	155.0	169.1	184.0	200.0	217.5	236.2	256.3	278.1	301.6	327	354.5
4. Station Use	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.4	3.4	3.4	3.4	3.4	3.4
5. Gross Generation	136.3	146.4	160.4	175.0	190.5	207.2	225.1	244.5	265.3	287.8	312.2	338.5	367
6. System Peak	29.9	31.5	33.2	36.3	39.5	43.0	46.8	50.8	55.2	59.9	65.0	70.5	76.5
7. System LF	52	53	55	55	55	55	55	55	55	55	55	55	55
Supply													
Existing	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Minihydro	65.6	65.6	65.4	64.9	64.9	64.9	63.1	63.1	63.1	63.1	63.1	63.1	63.1
Diesel	65.9	65.9	65.7	65.2	65.2	65.2	63.4	63.4	63.4	63.4	63.3	63.3	63.3
Sub-total													
Ongoing Projects													
Committed Projects													
Planned Projects													
Mini Hydro	-	-	-	1.0	1.0	1.0	2.0	4.3	4.3	4.3	4.3	4.3	4.3
Sentani #1-2	-	-	-	-	-	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Diesel	-	-	2.0	3.0	5.5	7.3	8.3	11.8	13.8	15.8	16.8	17.8	18.8
Sub-total	-	-	2.0	4.0	6.5	20.3	22.3	28.1	30.1	32.1	33.1	34.1	35.1
Total	65.9	65.9	67.7	69.2	71.7	85.5	85.6	91.4	93.4	95.4	96.4	97.4	98.4

09/MST/WV10

Energy & Load Demand Forecast  
PLN Region: X - Irian Jaya ( HIGH )

DKL2.0

Fiscal Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population(10 <sup>3</sup> )	1641.4	1689.9	1739.4	1787.6	1835.3	1883.9	1932.4	1981.8	2030.6	2079.9	2128.7	2178.5	2228.6	2278.6
Growth Rate (%)	3.4	3.0	2.9	2.8	2.7	2.6	2.6	2.6	2.5	2.4	2.4	2.3	2.3	2.2
Electric Ratio (%)	14.3	16.3	17.3	18.7	20.2	21.7	23.2	24.8	26.5	28.3	30.2	32.2	34.3	36.8
No. of Customers(10 <sup>3</sup> )	48.4	55.0	60.2	66.8	74.0	81.8	89.7	98.4	107.8	117.8	128.5	140.1	152.8	166.8
Power Contr./Cust.(VA)	812.8	858.1	892.1	946.9	992.4	1039.0	1086.8	1135.9	1185.0	1234.2	1283.4	1332.6	1381.8	1431.0
Power Contracted(MVA)	39.4	43.1	51.3	56.6	62.3	68.4	74.9	81.8	89.2	97.3	105.8	115.3	125.4	136.4
Growth of GDP Tot.(%)	6.19	6.23	6.24	6.26	6.28	6.29	6.30	6.31	6.32	6.33	6.34	6.35	6.36	6.37
Consump./Cust.(kwh)	1110.0	1080.0	1062.0	1046.0	1033.9	1023.6	1015.4	1008.0	1003.8	999.3	995.2	991.4	987.9	984.3
Energy Consump.(GWh)	53.8	59.5	64.0	70.1	76.5	83.5	91.1	98.2	106.1	114.8	123.8	133.9	145.0	157.0
Growth (%)	11.1	10.7	7.5	9.9	9.1	8.2	8.0	8.0	8.9	8.8	8.7	8.7	8.6	8.8
Share to Total (%)	54.8	54.8	54.3	54.2	53.9	53.7	53.5	53.3	53.1	53.0	52.8	52.6	52.4	52.2
<b>Commercial</b>														
No. of Customers	5493	6084	7428	8250	9127	10083	11093	12132	13277	14512	15945	17287	18949	20548
Customer Ratio to Res.	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Elasticity	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Growth of Gdp Sec.(%)	6.90	6.91	6.92	6.93	6.94	6.95	6.96	6.97	6.98	6.99	7.00	7.01	7.02	7.03
Power Contr./Cust.(VA)	2248.3	2874.0	2189.9	2189.9	2189.9	2189.9	2189.9	2189.9	2189.9	2189.9	2189.9	2189.9	2189.9	2189.9
Power Contracted(MVA)	12.4	16.3	16.3	18.1	20.0	22.0	24.2	26.6	29.1	31.8	34.7	37.9	41.3	45.0
Consump./Cust.(kwh)	2578.0	2810.7	2935.2	2935.4	2935.4	2935.4	2935.4	2935.4	2935.4	2935.4	2935.4	2935.4	2935.4	2935.4
Energy Consump.(GWh)	14.2	17.1	17.3	19.2	21.3	23.5	25.8	28.4	31.2	34.3	37.6	41.3	45.3	49.8
Growth (%)	17.0	20.8	1.0	11.1	10.9	10.3	10.1	10.0	9.8	9.8	9.8	9.7	9.7	9.7
Share to Total (%)	14.4	14.5	14.7	14.8	15.0	15.1	15.2	15.3	15.3	15.4	15.5	15.8	15.7	15.8
<b>Public &amp; Others</b>														
No. of Customers	3808	3847	4728	5252	5810	6408	7043	7723	8452	9238	10087	11005	11999	13080
Customer Ratio to Res.	0.07	0.06	0.08	0.08	0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Elasticity	0.9	0.2	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Power Contr./Cust.(VA)	4893.8	5354.5	5934.1	5934.1	5934.1	5934.1	5934.1	5934.1	5934.1	5934.1	5934.1	5934.1	5934.1	5934.1
Power Contracted(MVA)	17.8	17.9	23.3	28.1	31.1	34.3	37.7	41.3	45.2	49.4	54.0	58.8	64.2	70.0
Consump./Cust.(kwh)	5938.4	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8	5938.8
Energy Consump.(GWh)	20.3	21.4	25.3	28.3	31.8	35.0	38.8	42.8	47.4	52.4	57.8	63.8	70.4	77.7
Growth (%)	8.3	5.3	18.4	11.8	11.8	10.8	10.7	10.8	10.5	10.5	10.4	10.4	10.3	10.3
Share to Total (%)	20.7	21.1	21.5	21.6	22.2	22.5	22.8	23.1	23.3	23.8	24.1	24.4	24.4	24.7
<b>Industry</b>														
No. of Customers	130	159	121	127	133	139	146	153	160	167	175	183	192	201
Elasticity	0.8	0.3	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Growth of Gdp Sec.(%)	10.38	8.85	6.85	6.04	6.04	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
Power Contr./Cust.(VA)	40576.0	37305.4	37504.0	37780.9	38040.0	38382.7	38734.5	39160.7	39689.8	40243.2	40894.5	41630.0	42456.7	43382.2
Power Contracted(MVA)	5.3	6.3	4.5	4.8	5.1	5.2	5.6	6.0	6.3	6.7	7.2	7.8	8.1	8.7
Energy Ind.Demand(GWh)	36.3	38.2	40.2	42.1	44.2	46.2	48.4	50.7	53.0	55.6	58.1	60.8	63.7	66.9
Energy Big Cust.(GWh)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Captive Power (GWh)	28.2	27.5	28.8	30.3	31.5	32.7	33.9	35.1	36.4	37.7	39.1	40.5	42.0	43.8
Captive Takeover(GWh)	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Share PLN to Tot.(%)	28.00	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01	28.01
Energy Consump.(GWh)	10.2	11.0	11.3	11.8	12.7	13.8	14.5	15.8	16.8	17.8	19.0	20.3	21.8	23.1
Growth (%)	30.4	8.1	2.4	4.8	7.4	7.2	7.1	7.0	6.9	6.8	6.8	6.7	6.7	6.8
Share to Total (%)	10.3	10.0	9.8	9.1	8.9	8.7	8.3	8.4	8.2	8.0	7.8	7.7	7.5	7.3
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	57.7	65.1	72.5	80.5	89.1	98.2	107.9	118.4	129.5	141.9	154.9	168.9	183.9	200.4
Power Contracted(MVA)	74.6	83.8	97.4	107.8	118.5	130.1	142.3	155.7	169.9	185.2	201.7	219.8	239.0	260.4
Energy Consump.(GWh)	98.4	109.0	117.9	128.4	142.0	155.6	170.2	186.1	203.3	222.0	242.3	264.3	288.3	314.4
Growth Rate (%)	13.0	10.7	8.1	9.8	9.8	9.5	9.4	9.3	9.2	9.2	9.1	9.1	9.1	9.0
T & D Losses (%) +)	11.7	16.8	16.1	15.9	15.4	14.9	14.4	13.9	13.4	12.9	12.4	11.9	11.4	10.8
Energy Sent Out(GWh)	119.7	131.7	141.4	155.0	166.1	184.0	200.1	217.5	236.2	256.3	278.1	301.8	327.0	354.5
Plant Use (%)	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Production (GWh)	123.9	138.3	148.4	160.4	175.0	190.5	207.2	225.1	244.5	265.3	287.8	312.2	338.5	367.0
Load Factor (%)	52.1	52.0	53.0	55.1	55.1	55.0	55.0	54.8	54.8	54.8	54.9	54.8	54.8	54.8
Peak Load (MW)	27.1	29.9	31.5	33.2	36.3	39.5	43.0	46.8	50.9	55.2	59.9	65.0	70.5	76.4

\* Actual # Estimated  
+ ) Losses to production

M E I 1992

DKL DIVSIS/dss

DEMAND AND SUPPLY  
PLN REGION XI  
(EXCLUDING BALI)

Supply - Demand	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
<b>Demand</b>													
1. Sales	180.2	183.1	188.6	205.6	225.2	249.2	274.7	299.3	331.2	366.1	404.0	444.8	489.2
Increase	4.4	1.6	3.0	9.0	9.5	10.7	10.2	9.0	10.7	10.5	10.4	10.1	10.0
2. Losses T & D	61.9	64.2	66.8	71.1	75.5	77.2	78.1	77.8	74.9	75.2	72.2	68.2	62.3
(%)	24.4	24.7	24.9	24.5	23.9	22.5	21.1	19.7	17.6	16.2	14.5	12.7	10.8
3. Sent Out Energy	242.1	247.3	255.4	276.7	300.7	326.4	352.8	377.1	406.1	441.3	476.2	513.0	551.5
(GWh)	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
4. Station Use	254.0	259.5	268.0	290.3	315.5	342.5	370.2	395.7	426.1	463.1	499.7	538.3	578.7
(GWh)	70.5	74.6	79.9	87.5	95.9	104.7	113.8	123.4	135.4	148.4	162.4	177.4	193.6
5. Gross Generation													
(MW)	41	40	38	38	38	37	37	37	36	36	35	35	34
6. System Peak													
(%)													
7. System LF													
(MW)													
<b>Supply</b>													
Existing	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.39	0.39	0.39	0.39	0.39	0.39
Minihydro	146.43	145.43	140.92	136.21	135.77	130.26	128.26	123.46	117.40	111.51	110.11	104.94	97.37
Diesel	146.94	145.94	141.43	136.72	136.28	130.77	128.77	123.85	117.79	111.9	110.5	105.33	97.76
Sub-total													
Ongoing Projects			15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Lombok, DPP													
Committed Projects													
Ulumbu, GEPP					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Planned Projects													
Mini Hydro				2.8	2.8	2.8	6.1	6.1	9.4	9.4	9.4	9.4	9.4
Beburung, HEPP							22.4	22.4	22.4	22.4	22.4	22.4	22.4
Iralalaro, HEPP										27.0	27.0	27.0	27.0
Diesel		4.0	7.5	31.6	40.1	56.6	59.1	62.1	72.1	77.1	82.1	87.1	92.1
Hu 'u #1-2, GEOPP									10.0	10.0	10.0	10.0	10.0
Mutubusa #1-2, GEOPP									7.5	7.5	7.5	7.5	7.5
Sub, Total	0.0	4.0	7.5	34.4	42.9	59.4	87.6	90.6	121.4	153.4	158.4	163.4	168.4
<b>Total</b>	146.9	149.9	164.1	186.3	197.4	208.4	234.6	232.6	257.4	283.5	287.1	286.9	284.4

05MSTW11



Energy & Load Demand Forecast  
PLN Region: XI - Donpasir ( HIGH )

Forecast Year	1990*	1991*	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Residential</b>														
Population (10 <sup>3</sup> )	10163.8	10335.5	10515.8	10689.9	10854.8	11018.8	11180.8	11342.4	11485.7	11647.8	11799.8	11941.3	12078.3	12215.3
Growth Rate (%)	1.8	1.7	1.7	1.7	1.5	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.1	1.1
Elect. Ratio (%)	23.4	26.1	27.3	30.1	32.8	35.8	38.3	41.5	44.8	47.7	50.8	53.8	57.1	60.4
No. of Customers (10 <sup>3</sup> )	475.7	540.7	578.3	644.3	713.2	785.8	861.5	941.1	1024.7	1110.3	1198.1	1286.0	1390.2	1474.7
Power Contr./Cust. (VA)	544.3	545.0	530.1	540.3	541.2	542.0	542.7	543.3	543.9	544.3	544.8	545.1	545.7	545.7
Power Contracted (MVA)	258.9	295.2	311.8	346.1	386.0	425.8	487.5	513.3	557.3	604.4	652.7	702.1	742.8	804.8
Growth of GDP Tot. (%)	8.43	8.43	8.40	8.43	8.09	8.29	8.27	8.28	8.24	8.23	8.21	8.20	8.18	8.15
Consump./Cust. (kwh)	530.8	556.5	577.4	637.9	638.7	643.7	650.8	658.1	670.8	678.9	680.2	681.1	682.1	682.3
Energy Consump. (GWh)	252.6	300.9	310.8	348.5	384.2	427.1	474.5	528.8	584.7	648.0	719.0	788.7	862.1	976.3
Growth (%)	13.8	18.1	3.3	11.5	10.8	11.2	11.1	11.0	11.0	10.8	10.9	10.8	10.7	10.7
Share to Total (%)	45.2	48.5	48.0	49.2	48.5	48.1	47.8	47.5	48.0	48.2	48.5	48.7	48.0	48.2
<b>Commercial</b>														
No. of Customers	18084	20683	21712	24188	26779	28492	32342	35331	38489	41884	44878	48354	51814	55382
Customer Ratio to Res.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Elasticity	1.2	0.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Growth of Gdp Sec. (%)	8.83	8.84	8.84	8.84	8.85	8.31	8.31	8.31	8.32	8.32	8.33	8.33	8.33	8.34
Power Contr./Cust. (VA)	2400.1	2418.8	2385.0	2380.8	2340.5	2323.0	2307.7	2284.4	2282.6	2272.4	2263.4	2255.5	2248.5	2242.2
Power Contracted (MVA)	45.1	50.0	51.2	57.1	62.7	68.5	74.8	81.1	87.8	94.7	101.8	109.1	118.5	124.1
Consump./Cust. (kwh)	2694.8	3006.5	2881.2	2848.1	3022.3	3090.8	3188.1	3233.7	3347.5	3452.8	3568.8	3697.2	3839.0	3988.1
Energy Consump. (GWh)	48.8	62.0	62.8	71.3	80.8	91.2	102.5	115.0	126.8	143.8	160.8	178.8	198.8	220.7
Growth (%)	22.0	27.2	0.8	13.0	13.8	12.6	12.4	12.2	12.0	11.8	11.5	11.4	11.2	11.0
Share to Total (%)	9.3	10.0	8.8	10.1	10.2	10.3	10.3	10.4	10.6	10.7	10.8	10.8	11.0	11.1
<b>Public &amp; Others</b>														
No. of Customers	18343	20078	22586	25181	27854	30879	33843	38753	40017	43382	46788	50300	53899	57580
Customer Ratio to Res.	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Elasticity	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Power Contr./Cust. (VA)	2797.3	2838.1	2718.3	2715.4	2714.8	2713.4	2712.3	2711.2	2710.3	2708.5	2708.8	2708.2	2707.7	2707.2
Power Contracted (MVA)	50.2	53.0	61.4	66.3	75.6	83.2	91.2	99.5	108.9	117.3	126.7	136.2	146.9	159.8
Consump./Cust. (kwh)	3057.8	3356.7	3144.2	3176.4	3218.3	3255.4	3289.3	3350.4	3406.4	3476.8	3552.2	3637.4	3731.0	3832.7
Energy Consump. (GWh)	56.1	87.4	71.0	78.8	89.7	99.9	111.0	123.1	136.4	150.7	166.2	183.0	201.1	230.7
Growth (%)	11.7	20.2	5.4	12.5	12.2	11.4	11.1	10.8	10.5	10.3	10.3	10.1	9.9	9.8
Share to Total (%)	10.7	10.8	11.2	11.3	11.3	11.3	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.1
<b>Industry</b>														
No. of Customers	1772	1883	2015	2193	2388	2583	2818	3058	3321	3607	3917	4254	4621	5019
Elasticity	0.8	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Growth of Gdp Sec. (%)	12.70	10.39	10.59	8.88	8.88	8.55	8.35	8.55	8.58	8.58	8.58	8.57	8.57	8.57
Power Contr./Cust. (VA)	84081.3	80010.8	84238.7	83881.4	83710.3	83710.3	83882.4	84224.0	84733.7	85410.7	86255.3	87288.5	88452.1	89808.0
Power Contracted (MVA)	113.8	113.0	100.3	116.2	128.3	138.3	151.7	165.8	181.5	198.8	220.4	243.8	270.1	300.2
Energy Ind. Demand (GWh)	258.8	271.3	310.1	337.8	367.8	398.1	433.4	470.7	511.2	558.2	602.8	654.8	711.3	772.8
Energy Big Cust. (GWh)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capitive Power (GWh)	81.8	81.8	119.0	130.4	130.4	128.8	128.3	132.7	142.8	153.8	165.3	177.8	191.4	206.0
Share PLN to Tot. (%)	64.53	65.87	61.33	61.33	64.53	67.47	70.17	71.81	72.07	72.39	72.56	72.84	73.09	73.34
Energy Consump. (GWh)	188.8	190.0	190.2	207.1	237.2	268.3	304.1	338.0	368.4	401.8	437.8	477.0	518.9	568.5
Growth (%)	38.1	13.8	0.1	8.9	14.5	13.8	12.9	11.1	9.0	8.0	8.0	8.0	8.0	8.0
Share to Total (%)	31.8	30.8	30.0	28.4	28.8	30.3	30.7	30.6	30.2	29.9	29.5	28.2	28.9	28.8
<b>Total</b>														
No. of Customers (10 <sup>3</sup> )	513.9	624.7	624.7	885.8	770.3	848.3	950.3	1016.9	1106.5	1199.0	1293.6	1390.8	1480.5	1582.8
Power Contracted (MVA)	487.7	511.2	534.3	591.7	632.5	718.8	765.1	857.9	933.5	1018.5	1101.8	1191.8	1285.4	1385.0
Energy Consump. (GWh)	524.3	620.3	634.8	704.8	792.0	887.4	992.1	1103.0	1218.3	1344.8	1463.4	1635.5	1801.8	1984.2
Growth Rate (%)	20.5	18.3	2.3	11.1	12.4	12.0	11.8	11.2	10.5	10.4	10.3	10.2	10.2	10.1
T & D Losses (%) +	18.3	15.1	14.8	16.7	16.2	15.7	15.2	14.7	14.2	13.7	13.2	12.7	12.2	11.7
Energy Sent Out (GWh)	843.8	732.4	744.8	845.7	947.9	1053.7	1173.1	1298.5	1423.8	1582.1	1713.1	1877.7	2058.7	2251.9
Plant Use (%)	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Production (GWh)	682.8	742.3	754.9	860.7	981.4	1070.7	1189.8	1314.9	1443.9	1584.3	1737.4	1904.3	2085.9	2283.8
Load Factor (%)	40.3	48.0	45.8	48.7	48.9	47.0	47.1	47.0	47.0	46.9	46.8	46.8	46.7	46.8
Peak Load (MW)	181.0	184.0	187.0	210.2	233.9	259.8	288.3	318.5	350.4	385.3	423.3	464.8	510.0	558.3

DKL DIVS/655

MEI 1992

\* Actual # Estimated  
+ ) Losses to production





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