

PLTN

SOLUTION # 1 VARIABLE ALTERNATIVES BY YEAR

YEAR-----	PRESENT WORTH	COST OF THE YEAR (K\$)-----	OBJ.FUN.	LOLP	C10H	N10H	CC75	C300	HYD1								
CONCST	SALVAL	OPCOST	ENSCST	TOTAL	(CUMM.)	%	LNG	G200	GE55	C600	PUMP						
2030	2321277	2103370	1974013	0	2191920	122472328	0.031	0	0	91	34	0	58	22	22	4	12
2029	3350258	2753243	1981609	0	2578624	120280408	0.032	0	0	83	13	0	58	22	22	4	12
2028	611704	453248	2063488	0	2221944	117701784	0.044	0	0	72	8	0	58	22	20	4	12
2027	250613	166341	1971767	0	2056040	115479840	0.000	0	0	71	8	0	50	20	20	4	12
2026	6640745	4059446	2537197	0	5118496	113423800	0.045	0	0	71	8	0	50	20	18	4	12
2025	2948679	1627116	2490343	103	3812008	108305304	0.068	0	0	54	1	0	42	20	18	4	12
2024	3763902	1886868	2530710	40	4407784	104493296	0.055	0	0	48	1	0	42	18	16	4	12
2023	6557997	2966825	2694608	581	6286360	100085512	0.110	0	0	40	1	0	36	18	16	4	12
2022	2915021	1181993	2666939	1129	4401096	93799152	0.153	0	0	28	0	0	36	16	14	4	12
2021	2677838	974467	2764007	222	4467600	89398056	0.062	0	0	24	0	0	28	14	13	4	12
2020	2628613	866443	2810434	124	4572728	84930456	0.047	0	0	21	0	0	24	12	11	4	12
2019	2925243	867350	2880148	0	4938040	80357728	0.016	0	0	18	0	0	20	12	9	4	12
2018	3272941	882567	2979474	0	5369848	75419688	0.000	0	0	15	0	0	17	10	8	4	12
2017	3261144	754184	3104040	0	5611000	70049840	0.000	0	0	12	0	0	13	8	8	4	8
2016	3343064	733599	3106855	0	5716320	64438840	0.000	0	0	11	0	0	11	7	3	2	4
2015	4950401	968436	3263571	0	7245536	58722520	0.000	0	0	8	0	0	9	6	3	0	4
2014	3045040	508005	3591328	0	6128364	51476984	0.000	0	0	4	0	0	8	5	2	0	4
2013	4151255	660039	3647620	0	7138836	45348620	0.000	0	0	3	0	0	2	3	1	0	0
2012	1383562	155867	3946143	0	5173838	38209784	0.000	0	0	0	0	0	2	2	1	0	0
2011	0	0	3782834	0	3782834	33035946	0.000	0	0	0	0	0	0	0	0	0	0
2010	0	1	3785993	0	3785992	29253112	0.000	0	0	0	0	0	0	0	0	0	0
2009	0	0	6912200	2676	6914876	25467120	0.153	0	0	0	0	0	0	0	0	0	0
2008	0	0	8827882	35118	8863000	18552244	1.300	0	0	0	0	0	0	0	0	0	0
2007	0	0	9687209	2035	9689244	9689244	0.107	0	0	0	0	0	0	0	0	0	0

TANPA PLTN

SOLUTION # 1 VARIABLE ALTERNATIVES BY YEAR

YEAR-----	PRESENT WORTH	COST OF THE YEAR (K\$)-----	OBJ.FUN. (CUMM.)	LOLP %	C10H LNG	N10H G200	CC75 GE55	C300 C600	HYD1 PUMP								
CONCST	SALVAL	OPCOST	ENSCST	TOTAL													
2030	2048201	1850003	3060568	1530	3260296	129703296	0.254	87	1	0	53	4	58	22	22	4	12
2029	2336846	1904619	3088458	1732	3522416	126443000	0.262	77	1	0	40	4	58	22	22	4	12
2028	530896	390841	3115401	1832	3257288	122920584	0.260	68	0	0	28	4	58	22	20	4	12
2027	250613	166341	3113400	0	3197672	119663296	0.000	67	0	0	28	4	50	20	20	4	12
2026	4503399	2680677	3795858	2100	5620680	116465624	0.252	67	0	0	28	4	50	20	18	4	12
2025	2183235	1171359	3501366	2454	4515696	110844944	0.268	54	0	0	13	0	42	20	18	4	12
2024	2255455	1088679	3505425	2456	4674656	106329248	0.255	49	0	0	5	0	42	18	16	4	12
2023	5359948	2326023	3576436	1359	6611720	101654592	0.160	43	0	0	1	0	36	18	16	4	12
2022	2742419	1067042	3319605	2258	4997240	95042872	0.225	30	0	0	0	0	36	16	14	4	12
2021	2645448	921118	3397167	1591	5123088	90045632	0.168	25	0	0	0	0	28	14	13	4	12
2020	2108955	655902	3457412	2912	4913376	84922544	0.250	21	0	0	0	0	24	12	11	4	12
2019	2886051	800036	3488462	788	5575264	80009168	0.094	18	0	0	0	0	20	12	9	4	12
2018	3229831	807204	3577973	0	6000600	74433904	0.015	14	0	0	0	0	17	10	8	4	12
2017	2386346	538378	3700321	0	5548288	68433304	0.007	10	0	0	0	0	13	8	8	4	8
2016	2582233	502769	3655560	0	5735024	62885016	0.002	10	0	0	0	0	11	7	3	2	4
2015	3054981	519551	3723702	0	6259132	57149992	0.001	7	0	0	0	0	9	6	3	0	4
2014	2738171	426579	3809884	0	6121476	50890860	0.000	4	0	0	0	0	8	5	2	0	4
2013	3138589	408017	3829029	0	6559600	44769384	0.001	3	0	0	0	0	2	3	1	0	0
2012	1383562	155867	3946143	0	5173838	38209784	0.000	0	0	0	0	0	2	2	1	0	0
2011	0	0	3782834	0	3782834	33035946	0.000	0	0	0	0	0	0	0	0	0	0
2010	0	1	3785993	0	3785992	29253112	0.000	0	0	0	0	0	0	0	0	0	0
2009	0	0	6912200	2676	6914876	25467120	0.153	0	0	0	0	0	0	0	0	0	0
2008	0	0	8827882	35118	8863000	18552244	1.300	0	0	0	0	0	0	0	0	0	0
2007	0	0	9687209	2035	9689244	9689244	0.107	0	0	0	0	0	0	0	0	0	0

PLTN
SUMMARY OF
FIXED SYSTEM PLUS OPTIMUM SOLUTION
(NOMINAL CAPACITY (MW))- SKENARIO NUKLIR
THERMAL FUEL TYPE
CAPACITIES

YEAR	0 COAL	1 GAS	2 LNG	3 MFO	4 HSD	5 GEO	6 NUC	7 ****	8 ****	9 ****	TOTAL CAP
2007	7771	3729	0	718	5183	826	0	0	0	0	18227
2008	7771	3729	0	718	5183	886	0	0	0	0	18287
2009	8716	5468	0	718	5183	886	0	0	0	0	20971
2010	14791	5468	0	274	5128	1076	0	0	0	0	26737
2011	15521	8364	0	192	5118	1136	0	0	0	0	30331
2012	16721	8348	0	192	5118	1220	0	0	0	0	31599
2013	17021	8348	0	192	5118	1220	3000	0	0	0	34899
2014	18221	8316	0	192	5118	1550	4000	0	0	0	37397
2015	18740	8316	0	192	5118	1605	8000	0	0	0	41971
2016	19040	8316	0	192	5118	1715	11000	0	0	0	45381
2017	22340	7155	0	0	5038	1731	12000	0	0	0	48264
2018	22940	6160	0	0	3942	1951	15000	0	0	0	49993
2019	23378	6160	0	0	2384	2116	18000	0	0	0	52038
2020	24578	5695	0	0	2344	2336	21000	0	0	0	55953
2021	26378	5695	0	0	2344	2556	24000	0	0	0	60973
2022	27578	5695	0	0	1330	2996	28000	0	0	0	65599
2023	28638	5695	0	0	1530	2996	40000	0	0	0	78859
2024	28638	5695	0	0	1530	3178	48000	0	0	0	87041
2025	30438	5695	0	0	1498	3178	54000	0	0	0	94809
2026	30438	5695	0	0	2854	3618	71000	0	0	0	113605
2027	30099	5695	0	0	2554	3514	71000	0	0	0	112862
2028	29505	5545	0	0	2554	3850	72000	0	0	0	113454
2029	29480	5545	0	0	2600	3670	83000	0	0	0	124295
2030	28870	5545	0	0	6800	3670	91000	0	0	0	135885

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SUMMARY OF
FIXED SYSTEM PLUS OPTIMUM SOLUTION
EXPECTED POLLUTING MATERIAL SO2 EMITTED BY FUEL TYPE IN (kt)
THERMAL FUEL TYPES

YEAR	0 COAL	1 GAS	2 LNG	3 MFO	4 HSD	5 GEO	6 NUC	7 ****	8 ****	9 ****	TOTAL
2007	485.6	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	487.1
2008	497.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	497.4
2009	497.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	497.2
2010	501.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	501.2
2011	513.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	513.6
2012	559.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	559.4
2013	568.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	568.3
2014	612.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	612.3
2015	577.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	577.0
2016	579.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	579.2
2017	586.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	586.1
2018	605.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	605.2
2019	590.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	590.9
2020	573.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	573.4
2021	586.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	586.6
2022	591.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	591.6
2023	485.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	485.1
2024	409.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	409.7
2025	406.8	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	406.9
2026	317.9	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	318.1
2027	65.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.8
2028	216.7	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	216.9
2029	133.9	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	134.1
2030	163.1	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	164.5

PLTN
SUMMARY OF
FIXED SYSTEM PLUS OPTIMUM SOLUTION
EXPECTED POLLUTING MATERIAL CO2 EMITTED BY FUEL TYPE IN (kT)

YEAR	THERMAL FUEL TYPES											TOTAL
	0	1	2	3	4	5	6	7	8	9		
COAL	GAS	LNG	MFO	HSD	GEO	NUC	****	****	****	****		
2007	36904.0	29283.3	0.0	1710.9	15562.8	0.0	0.0	0.0	0.0	0.0	83461.0	
2008	37804.0	37273.7	0.0	1740.3	16713.6	0.0	0.0	0.0	0.0	0.0	93531.6	
2009	37790.2	36425.6	0.0	572.5	11779.0	0.0	0.0	0.0	0.0	0.0	86567.3	
2010	38093.2	25482.8	0.0	0.2	181.7	0.0	0.0	0.0	0.0	0.0	63757.9	
2011	39032.4	22378.0	0.0	0.0	32.5	0.0	0.0	0.0	0.0	0.0	61442.9	
2012	45486.8	24671.1	0.0	0.3	200.3	0.0	0.0	0.0	0.0	0.0	70358.5	
2013	46141.0	22389.4	0.0	0.2	111.3	0.0	0.0	0.0	0.0	0.0	68641.9	
2014	52452.2	21915.2	0.0	0.1	43.3	0.0	0.0	0.0	0.0	0.0	74410.8	
2015	52502.3	16654.8	0.0	0.0	8.6	0.0	0.0	0.0	0.0	0.0	69165.7	
2016	52569.7	15278.9	0.0	0.0	9.2	0.0	0.0	0.0	0.0	0.0	67857.8	
2017	67218.5	7211.1	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	74434.0	
2018	68449.1	5044.4	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	73497.3	
2019	70020.0	5025.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	75050.1	
2020	73843.4	3483.2	0.0	0.0	11.5	0.0	0.0	0.0	0.0	0.0	77338.1	
2021	79720.7	3247.2	0.0	0.0	13.6	0.0	0.0	0.0	0.0	0.0	82981.5	
2022	81562.4	2704.4	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	84279.0	
2023	73979.4	1731.1	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	75723.5	
2024	64963.1	1394.9	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	66364.2	
2025	67599.0	1165.7	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	68773.6	
2026	55282.1	860.0	0.0	0.0	19.7	0.0	0.0	0.0	0.0	0.0	56161.8	
2027	23695.8	34.8	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	23730.5	
2028	49753.6	748.1	0.0	0.0	15.3	0.0	0.0	0.0	0.0	0.0	50517.0	
2029	40154.2	65.6	0.0	0.0	11.7	0.0	0.0	0.0	0.0	0.0	40231.5	
2030	44551.6	778.7	0.0	0.0	97.2	0.0	0.0	0.0	0.0	0.0	45427.5	

TANPA PLTN
SUMMARY OF
FIXED SYSTEM PLUS OPTIMUM SOLUTION
(NOMINAL CAPACITY (MW))
THERMAL FUEL TYPE
CAPACITIES

YEAR	0 COAL	1 GAS	2 LNG	3 MFO	4 HSD	5 GEO	6 NUC	7 ****	8 ****	9 ****	TOTAL CAP
2007	7771	3729	0	718	5183	826	0	0	0	0	18227
2008	7771	3729	0	718	5183	886	0	0	0	0	18287
2009	8716	5468	0	718	5183	886	0	0	0	0	20971
2010	14791	5468	0	274	5128	1076	0	0	0	0	26737
2011	15521	8364	0	192	5118	1136	0	0	0	0	30331
2012	16721	8348	0	192	5118	1220	0	0	0	0	31599
2013	20021	8348	0	192	5118	1220	0	0	0	0	34899
2014	22221	8316	0	192	5118	1550	0	0	0	0	37397
2015	25740	8316	0	192	5118	1605	0	0	0	0	40971
2016	29040	8316	0	192	5118	1715	0	0	0	0	44381
2017	32340	7155	0	0	5038	1731	0	0	0	0	46264
2018	36940	6160	0	0	3942	1951	0	0	0	0	48993
2019	41378	6160	0	0	2384	2116	0	0	0	0	52038
2020	45578	5695	0	0	2344	2336	0	0	0	0	55953
2021	51378	5695	0	0	2344	2556	0	0	0	0	61973
2022	57578	5695	0	0	1330	2996	0	0	0	0	67599
2023	71638	5695	0	0	1530	2996	0	0	0	0	81859
2024	77638	5695	0	0	2330	3178	0	0	0	0	88841
2025	84438	5695	0	0	3898	3178	0	0	0	0	97209
2026	97438	8695	0	0	6854	3618	0	0	0	0	116605
2027	97099	8695	0	0	6554	3514	0	0	0	0	115862
2028	97505	8545	0	0	6554	3850	0	0	0	0	116454
2029	106480	8545	750	0	8000	3670	0	0	0	0	127445
2030	115870	8545	750	0	10600	3670	0	0	0	0	139435

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SUMMARY OF
FIXED SYSTEM PLUS OPTIMUM SOLUTION
EXPECTED POLLUTING MATERIAL SO₂ EMITTED BY FUEL TYPE IN (kt)

YEAR	THERMAL FUEL TYPES											TOTAL
	0 COAL	1 GAS	2 LNG	3 MFO	4 HSD	5 GEO	6 NUC	7 ****	8 ****	9 ****		
2007	485.6	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	487.1
2008	497.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	497.4
2009	497.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	497.2
2010	501.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	501.2
2011	513.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	513.6
2012	559.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	559.4
2013	734.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	734.0
2014	829.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	829.9
2015	975.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	975.4
2016	1148.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1148.5
2017	1166.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1166.2
2018	1398.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1398.6
2019	1565.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1565.1
2020	1713.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1713.1
2021	1910.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1910.4
2022	2144.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2144.2
2023	2765.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2765.3
2024	3016.3	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	3017.3
2025	3315.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	3317.8
2026	4052.2	0.0	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	4059.9
2027	3667.7	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	3668.0
2028	3958.8	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	3965.7
2029	4362.8	0.0	0.0	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0	4372.6
2030	4848.3	0.0	0.0	0.0	17.2	0.0	0.0	0.0	0.0	0.0	0.0	4865.5

TANPA PLTN
SUMMARY OF
FIXED SYSTEM PLUS OPTIMUM SOLUTION
EXPECTED POLLUTING MATERIAL CO2 EMITTED BY FUEL TYPE IN (kt)
THERMAL FUEL TYPES

Lampiran I-8 64

YEAR	0 COAL	1 GAS	2 LNG	3 MFO	4 HSD	5 GEO	6 NUC	7 ****	8 ****	9 ****	TOTAL
2007	36904.0	29283.3	0.0	1710.9	15562.8	0.0	0.0	0.0	0.0	0.0	83461.0
2008	37804.0	37273.7	0.0	1740.3	16713.6	0.0	0.0	0.0	0.0	0.0	93531.6
2009	37790.2	36425.6	0.0	572.5	11779.0	0.0	0.0	0.0	0.0	0.0	86567.3
2010	38093.2	25482.8	0.0	0.2	181.7	0.0	0.0	0.0	0.0	0.0	63757.9
2011	39032.4	22378.0	0.0	0.0	32.5	0.0	0.0	0.0	0.0	0.0	61442.9
2012	45486.8	24671.1	0.0	0.3	200.3	0.0	0.0	0.0	0.0	0.0	70358.5
2013	58750.0	22037.4	0.0	0.3	147.4	0.0	0.0	0.0	0.0	0.0	80935.1
2014	69013.1	22552.9	0.0	0.1	68.1	0.0	0.0	0.0	0.0	0.0	91634.2
2015	83005.5	19674.5	0.0	0.1	63.5	0.0	0.0	0.0	0.0	0.0	102743.6
2016	96119.0	18282.1	0.0	0.2	78.9	0.0	0.0	0.0	0.0	0.0	114480.2
2017	112353.2	13110.2	0.0	0.0	106.0	0.0	0.0	0.0	0.0	0.0	125569.4
2018	129800.3	6352.9	0.0	0.0	42.1	0.0	0.0	0.0	0.0	0.0	136195.3
2019	145271.9	5736.9	0.0	0.0	24.9	0.0	0.0	0.0	0.0	0.0	151033.7
2020	162308.4	3680.1	0.0	0.0	54.9	0.0	0.0	0.0	0.0	0.0	166043.4
2021	182501.8	2596.8	0.0	0.0	34.8	0.0	0.0	0.0	0.0	0.0	185133.4
2022	202438.6	1856.1	0.0	0.0	18.1	0.0	0.0	0.0	0.0	0.0	204312.8
2023	250698.3	944.5	0.0	0.0	18.4	0.0	0.0	0.0	0.0	0.0	251661.2
2024	272168.2	919.8	0.0	0.0	88.9	0.0	0.0	0.0	0.0	0.0	273176.9
2025	300634.3	1400.8	0.0	0.0	214.6	0.0	0.0	0.0	0.0	0.0	302249.7
2026	357178.6	9432.1	0.0	0.0	562.8	0.0	0.0	0.0	0.0	0.0	367173.5
2027	328223.0	1025.8	0.0	0.0	18.4	0.0	0.0	0.0	0.0	0.0	329267.2
2028	355679.5	8916.3	0.0	0.0	504.5	0.0	0.0	0.0	0.0	0.0	365100.3
2029	391654.9	9471.2	255.4	0.0	699.2	0.0	0.0	0.0	0.0	0.0	402080.7
2030	427933.7	10702.3	353.7	0.0	1226.6	0.0	0.0	0.0	0.0	0.0	440216.3