COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity bagasse price 200 Baht/tonne**
Date:	08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA	
Mill Capacity (input) (tcy)	2,200,000
Type of Residue Produced	bagasse
Residue/Mill Input Ratio	27.00%
Total Bagasse Production (tpy)	594,000
Fuel Required from Other Sources (tpy):	
Bagasse (Phu Viang)	30,000
Rice husk	47,330
Wood bark	10,000
Cane leaves	44,500
Mill Heat Requirement (ton-steam/hr)	
Crushing: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@ 2.5 bar	376.2
Cane-waiting: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@ 2.5 bar	0.0
Remelting: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling	0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting	0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting	0.0
Mill Power Requirement (kW)	
Crushing	30,140
Cane-waiting	0
Remelting 1	6,000
Remelting 2	6,000
Off-milling/off-remelting	800
Crushing Duration (hr/yr)	2,315
Cane-waiting Duration (hr/yr)	0
Remelting 1 Duration (hr/yr)	2,644
Remelting Duration 2 (hr/yr)	2,241
Pure Power Generation (hr/yr)	720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	200.0000	4.6512
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		118,800	2,763
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS		1,000 Baht	1,000 US$
Investment Costs			
Development Costs		86,000	2,000
Equipment Costs (main equipment)		843,230	19,610
Equipment Costs (BOP)		73,100	1,700
Grid Connection		73,100	1,700
Engineering and Civil Works		129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost		25,284	588
Erection, Installation, Training, Handling & Land Transportation		43,000	1,000
Construction time insurance,1.50 % Equip. Cost		12,642	294
Transferred equipment from sugar mill (old)		387,000	9,000
SUB-TOTAL		1,672,356	38,892
Contingency	5.00% of sub-total	83,618	1,945
Total Investment Costs		1,755,974	40,837
Financing Costs during Construction			
Interest Costs		135,450	3,150
Other Financing Expenses		9,417	219
Total Financing Costs during Construction		144,867	3,369
TOTAL USES OF FUNDS (Project Cost)		**1,900,841**	**44,206**

SOURCES OF FUNDS		1,000 Baht	1,000 US$
Equity 1	34.01% of investment cost	646,476	15,034
Equity 2			
Grant			
Loan*		1,254,365	29,171
TOTAL SOURCES OF FUNDS		**1,900,841**	**44,206**
*Loan			
Amount		1,254,365	29,171
Grace Period			2
Maturity			9
Base Interest Rate			9.00%
Lender's Margin			1.00%
All-in Interest Rate			10.00%
Financing Fees			0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**10.17%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**448**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios		
	Minimum	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity bagasse price 200 Baht/tonne
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				2,763	2,846	2,931	3,019	3,110	3,203	3,299	3,398	3,500	3,605	3,713	3,824	3,939	4,057	4,179	4,304	4,433	4,566	4,703	4,845	4,990
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,608	2,739	2,876	3,020	3,171	3,329	3,496	3,670	3,854	4,047	4,249	4,461	4,684	4,919	5,165	5,423	5,694
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				6,812	7,071	7,340	7,620	7,913	8,354	8,679	9,018	9,371	9,740	10,298	10,708	11,136	11,583	12,049	12,536	13,044	13,574	14,128	14,706	15,310
Cash Flow from Operations				4,407	4,485	4,563	4,639	4,714	4,874	4,946	5,016	5,084	5,149	5,295	5,352	5,406	5,456	5,501	5,541	5,575	5,603	5,625	5,639	5,646
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				2,462	2,541	2,618	2,695	2,770	2,930	3,002	3,072	3,139	3,204	3,350	3,408	3,462	3,511	3,556	3,596	3,630	3,659	3,680	3,695	3,701
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(334)	(351)	(356)	(359)	(723)	(727)	(729)	(728)	(726)	(721)	(714)	(704)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	2,870	2,999	3,052	3,103	2,788	2,829	2,868	2,902	2,933	2,959	2,980	2,997
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,815**	**4,943**	**4,997**	**5,047**	**4,733**	**4,774**	**4,812**	**4,847**	**4,877**	**4,904**	**4,925**	**4,941**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,815**	**4,943**	**4,997**	**5,047**	**4,733**	**4,774**	**4,812**	**4,847**	**4,877**	**4,904**	**4,925**	**4,941**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,815	4,943	4,997	5,047	4,733	4,774	4,812	4,847	4,877	4,904	4,925	4,941
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,815	4,943	4,997	5,047	4,733	4,774	4,812	4,847	4,877	4,904	4,925	4,941
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**448**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	4,407	4,485	4,563	4,639	4,714	4,874	4,946	5,016	5,084	5,149	5,295	5,352	5,406	5,456	5,501	5,541	5,575	5,603	5,625	5,639	5,646
Pre-Tax Project IRR (total)		**10.17%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																					
Pre-Tax Cash Flow Coverage																					
of Interest	1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service	0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																					
of Interest	0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service	0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Case:	**sensitivity bagasse price 225 Baht/tonne**
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Residue/Mill Input Ratio		27.00%
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Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	225.0000	5.2326
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		133,650	3,108
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	86,000	2,000
Equipment Costs (main equipment)	843,230	19,610
Equipment Costs (BOP)	73,100	1,700
Grid Connection	73,100	1,700
Engineering and Civil Works	129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost	25,284	588
Erection, Installation, Training, Handling & Land Transportation	43,000	1,000
Construction time insurance,1.50 % Equip. Cost	12,642	294
Transferred equipment from sugar mill (old)	387,000	9,000
SUB-TOTAL	1,672,356	38,892
Contingency 5.00% of sub-total	83,618	1,945
Total Investment Costs	1,755,974	40,837
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,900,841**	**44,206**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	646,476	15,034
Equity 2		
Grant		
Loan*	1,254,365	29,171
TOTAL SOURCES OF FUNDS	**1,900,841**	**44,206**
*Loan		
Amount	1,254,365	29,171
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**9.01%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(2,605)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios		
	Minimum	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity bagasse price 225 Baht/tonne
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				3,108	3,201	3,297	3,396	3,498	3,603	3,711	3,823	3,937	4,055	4,177	4,302	4,431	4,564	4,701	4,842	4,988	5,137	5,291	5,450	5,614
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,608	2,739	2,876	3,020	3,171	3,329	3,496	3,670	3,854	4,047	4,249	4,461	4,684	4,919	5,165	5,423	5,694
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				7,158	7,426	7,706	7,998	8,302	8,754	9,091	9,443	9,809	10,191	10,762	11,186	11,629	12,090	12,572	13,074	13,598	14,145	14,716	15,312	15,934
Cash Flow from Operations				4,061	4,129	4,196	4,262	4,326	4,474	4,534	4,592	4,646	4,698	4,831	4,874	4,914	4,949	4,979	5,003	5,021	5,032	5,037	5,034	5,022
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				2,117	2,185	2,252	2,317	2,381	2,529	2,589	2,647	2,702	2,753	2,886	2,930	2,969	3,004	3,034	3,058	3,076	3,088	3,092	3,089	3,077
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(266)	(282)	(284)	(285)	(571)	(570)	(567)	(562)	(555)	(545)	(532)	(517)
Income After Tax				1,771	1,829	1,885	1,940	1,992	2,129	2,177	2,222	2,138	2,487	2,604	2,646	2,684	2,433	2,464	2,491	2,514	2,533	2,547	2,557	2,560
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,432**	**4,549**	**4,591**	**4,629**	**4,378**	**4,408**	**4,436**	**4,459**	**4,478**	**4,492**	**4,501**	**4,505**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,432**	**4,549**	**4,591**	**4,629**	**4,378**	**4,408**	**4,436**	**4,459**	**4,478**	**4,492**	**4,501**	**4,505**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,432	4,549	4,591	4,629	4,378	4,408	4,436	4,459	4,478	4,492	4,501	4,505
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,432	4,549	4,591	4,629	4,378	4,408	4,436	4,459	4,478	4,492	4,501	4,505
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(2,605)**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	4,061	4,129	4,196	4,262	4,326	4,474	4,534	4,592	4,646	4,698	4,831	4,874	4,914	4,949	4,979	5,003	5,021	5,032	5,037	5,034	5,022
Pre-Tax Project IRR (total)		**9.01%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME: **Phu Kieo Bioenergy Co., Ltd.**
Project: **Phu Kieo Bioenergy Cogeneration Plant**
Configuration: **120 tph biomass-fired boilers**
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition: **Sugar Mill to provide bagasse + raw water + land lease**
Sugar Mill to get steam and electricity
Case: **sensitivity bagasse price 275 Baht/tonne**
Date: 08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	275.0000	6.3953
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		163,350	3,799
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	86,000	2,000
Equipment Costs (main equipment)	843,230	19,610
Equipment Costs (BOP)	73,100	1,700
Grid Connection	73,100	1,700
Engineering and Civil Works	129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost	25,284	588
Erection, Installation, Training, Handling & Land Transportation	43,000	1,000
Construction time insurance,1.50 % Equip. Cost	12,642	294
Transferred equipment from sugar mill (old)	387,000	9,000
SUB-TOTAL	1,672,356	38,892
Contingency 5.00% of sub-total	83,618	1,945
Total Investment Costs	1,755,974	40,837
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,900,841**	**44,206**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	646,476	15,034
Equity 2		
Grant		
Loan*	1,254,365	29,171
TOTAL SOURCES OF FUNDS	**1,900,841**	**44,206**
*Loan		
Amount	1,254,365	29,171
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**6.49%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(8,709)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	**Minimum**	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)
Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: **Phu Kieo Bioenergy Co., Ltd.**
Project: **Phu Kieo Bioenergy Cogeneration Plant**
Configuration: **120 tph biomass-fired boilers**
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: **Sugar Mill to provide bagasse + raw water + land lease**
Sugar Mill to get steam and electricity
Case: **sensitivity bagasse price 275 Baht/tonne**
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				3,799	3,913	4,030	4,151	4,276	4,404	4,536	4,672	4,812	4,957	5,105	5,258	5,416	5,579	5,746	5,918	6,096	6,279	6,467	6,661	6,861
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,608	2,739	2,876	3,020	3,171	3,329	3,496	3,670	3,854	4,047	4,249	4,461	4,684	4,919	5,165	5,423	5,694
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				7,849	8,138	8,439	8,753	9,079	9,555	9,916	10,292	10,684	11,092	11,691	12,143	12,614	13,105	13,616	14,150	14,706	15,287	15,892	16,523	17,181
Cash Flow from Operations				3,371	3,418	3,464	3,507	3,548	3,673	3,709	3,742	3,771	3,797	3,902	3,918	3,929	3,934	3,934	3,927	3,912	3,891	3,861	3,822	3,775
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				1,426	1,473	1,519	1,562	1,604	1,729	1,765	1,797	1,827	1,852	1,958	1,974	1,985	1,990	1,989	1,982	1,968	1,946	1,916	1,878	1,830
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(131)	(143)	(140)	(137)	(267)	(257)	(244)	(230)	(212)	(192)	(169)	(143)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	1,721	1,815	1,833	1,847	1,723	1,732	1,738	1,738	1,734	1,724	1,709	1,687
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,666**	**3,760**	**3,778**	**3,792**	**3,668**	**3,677**	**3,682**	**3,683**	**3,679**	**3,669**	**3,653**	**3,632**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,666**	**3,760**	**3,778**	**3,792**	**3,668**	**3,677**	**3,682**	**3,683**	**3,679**	**3,669**	**3,653**	**3,632**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,666	3,760	3,778	3,792	3,668	3,677	3,682	3,683	3,679	3,669	3,653	3,632
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,666	3,760	3,778	3,792	3,668	3,677	3,682	3,683	3,679	3,669	3,653	3,632
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(8,709)**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	3,371	3,418	3,464	3,507	3,548	3,673	3,709	3,742	3,771	3,797	3,902	3,918	3,929	3,934	3,934	3,927	3,912	3,891	3,861	3,822	3,775
Pre-Tax Project IRR (total)		**6.49%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																						
Pre-Tax Cash Flow Coverage																						
of Interest		1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service		0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																						
of Interest		0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service		0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME: **Phu Kieo Bioenergy Co., Ltd.**
Project: **Phu Kieo Bioenergy Cogeneration Plant**
Configuration: **120 tph biomass-fired boilers**
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition: **Sugar Mill to provide bagasse + raw water + land lease**
Sugar Mill to get steam and electricity
Case: **sensitivity bagasse price 300 Baht/tonne**
Date: 08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	300.0000	6.9767
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		178,200	4,144
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	86,000	2,000
Equipment Costs (main equipment)	843,230	19,610
Equipment Costs (BOP)	73,100	1,700
Grid Connection	73,100	1,700
Engineering and Civil Works	129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost	25,284	588
Erection, Installation, Training, Handling & Land Transportation	43,000	1,000
Construction time insurance,1.50 % Equip. Cost	12,642	294
Transferred equipment from sugar mill (old)	387,000	9,000
SUB-TOTAL	1,672,356	38,892
Contingency 5.00% of sub-total	83,618	1,945
Total Investment Costs	1,755,974	40,837
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,900,841**	**44,206**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	646,476	15,034
Equity 2		
Grant		
Loan*	1,254,365	29,171
TOTAL SOURCES OF FUNDS	**1,900,841**	**44,206**
*Loan		
Amount	1,254,365	29,171
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**5.07%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(11,762)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	**Minimum**	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity bagasse price 300 Baht/tonne
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				4,144	4,269	4,397	4,528	4,664	4,804	4,948	5,097	5,250	5,407	5,569	5,737	5,909	6,086	6,268	6,457	6,650	6,850	7,055	7,267	7,485
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,608	2,739	2,876	3,020	3,171	3,329	3,496	3,670	3,854	4,047	4,249	4,461	4,684	4,919	5,165	5,423	5,694
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				8,194	8,494	8,805	9,130	9,468	9,955	10,328	10,717	11,121	11,542	12,155	12,621	13,106	13,612	14,139	14,688	15,261	15,857	16,480	17,128	17,805
Cash Flow from Operations				3,025	3,062	3,097	3,130	3,160	3,273	3,297	3,317	3,334	3,346	3,438	3,440	3,437	3,427	3,411	3,389	3,358	3,320	3,273	3,217	3,151
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				1,081	1,118	1,153	1,185	1,215	1,328	1,352	1,373	1,389	1,402	1,494	1,496	1,492	1,483	1,467	1,444	1,414	1,375	1,328	1,272	1,206
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(64)	(73)	(69)	(64)	(115)	(100)	(83)	(63)	(41)	(16)	13	44
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	1,338	1,421	1,427	1,429	1,368	1,367	1,361	1,350	1,334	1,313	1,285	1,250
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,283**	**3,365**	**3,372**	**3,373**	**3,313**	**3,311**	**3,306**	**3,295**	**3,279**	**3,257**	**3,229**	**3,195**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,283**	**3,365**	**3,372**	**3,373**	**3,313**	**3,311**	**3,306**	**3,295**	**3,279**	**3,257**	**3,229**	**3,195**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,283	3,365	3,372	3,373	3,313	3,311	3,306	3,295	3,279	3,257	3,229	3,195
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,283	3,365	3,372	3,373	3,313	3,311	3,306	3,295	3,279	3,257	3,229	3,195
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(11,762)**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	3,025	3,062	3,097	3,130	3,160	3,273	3,297	3,317	3,334	3,346	3,438	3,440	3,437	3,427	3,411	3,389	3,358	3,320	3,273	3,217	3,151
Pre-Tax Project IRR (total)		**5.07%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Rice Husk Price 560 Baht/tonne**
Date:	08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	560.0000	13.0233
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		85,655	1,992
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	86,000	2,000
Equipment Costs (main equipment)	843,230	19,610
Equipment Costs (BOP)	73,100	1,700
Grid Connection	73,100	1,700
Engineering and Civil Works	129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost	25,284	588
Erection, Installation, Training, Handling & Land Transportation	43,000	1,000
Construction time insurance,1.50 % Equip. Cost	12,642	294
Transferred equipment from sugar mill (old)	387,000	9,000
SUB-TOTAL	1,672,356	38,892
Contingency 5.00% of sub-total	83,618	1,945
Total Investment Costs	1,755,974	40,837
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,900,841**	**44,206**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	646,476	15,034
Equity 2		
Grant		
Loan*	1,254,365	29,171
TOTAL SOURCES OF FUNDS	**1,900,841**	**44,206**
*Loan		
Amount	1,254,365	29,171
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**8.44%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(4,070)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios		
	Minimum	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity Rice Husk Price 560 Baht/tonne
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
Operating Year		***-1***	***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***15***	***16***	***17***	***18***	***19***	***20***	***21***
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)				1,992	2,092	2,196	2,306	2,421	2,542	2,669	2,803	2,943	3,090	3,245	3,407	3,577	3,756	3,944	4,141	4,348	4,566	4,794	5,034	5,285
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				7,349	7,620	7,903	8,197	8,503	8,958	9,297	9,651	10,019	10,402	10,976	11,401	11,845	12,307	12,789	13,292	13,816	14,363	14,933	15,528	16,149
Cash Flow from Operations				3,870	3,935	4,000	4,063	4,124	4,270	4,328	4,384	4,436	4,486	4,617	4,660	4,698	4,732	4,761	4,785	4,803	4,815	4,820	4,817	4,807
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				1,926	1,991	2,055	2,118	2,180	2,326	2,383	2,439	2,492	2,542	2,673	2,715	2,754	2,787	2,817	2,840	2,858	2,870	2,875	2,873	2,862
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(235)	(250)	(252)	(253)	(506)	(505)	(502)	(497)	(489)	(480)	(468)	(453)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	2,307	2,423	2,464	2,501	2,281	2,312	2,338	2,362	2,381	2,395	2,405	2,410
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,252**	**4,368**	**4,408**	**4,445**	**4,226**	**4,256**	**4,283**	**4,306**	**4,325**	**4,340**	**4,350**	**4,354**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,252**	**4,368**	**4,408**	**4,445**	**4,226**	**4,256**	**4,283**	**4,306**	**4,325**	**4,340**	**4,350**	**4,354**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,252	4,368	4,408	4,445	4,226	4,256	4,283	4,306	4,325	4,340	4,350	4,354
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,252	4,368	4,408	4,445	4,226	4,256	4,283	4,306	4,325	4,340	4,350	4,354
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(4,070)**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	3,870	3,935	4,000	4,063	4,124	4,270	4,328	4,384	4,436	4,486	4,617	4,660	4,698	4,732	4,761	4,785	4,803	4,815	4,820	4,817	4,807
Pre-Tax Project IRR (total)		**8.44%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																						
Pre-Tax Cash Flow Coverage																						
of Interest		1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service		0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																						
of Interest		0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service		0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Rice Husk Price 630 Baht/tonne**
Date:	08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA	
Mill Capacity (input) (tcy)	2,200,000
Type of Residue Produced	bagasse
Residue/Mill Input Ratio	27.00%
Total Bagasse Production (tpy)	594,000
Fuel Required from Other Sources (tpy):	
Bagasse (Phu Viang)	30,000
Rice husk	47,330
Wood bark	10,000
Cane leaves	44,500
Mill Heat Requirement (ton-steam/hr)	
Crushing: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@ 2.5 bar	376.2
Cane-waiting: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@ 2.5 bar	0.0
Remelting: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling	0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting	0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting	0.0
Mill Power Requirement (kW)	
Crushing	30,140
Cane-waiting	0
Remelting 1	6,000
Remelting 2	6,000
Off-milling/off-remelting	800
Crushing Duration (hr/yr)	2,315
Cane-waiting Duration (hr/yr)	0
Remelting 1 Duration (hr/yr)	2,644
Remelting Duration 2 (hr/yr)	2,241
Pure Power Generation (hr/yr)	720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	630.0000	14.6512
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		88,968	2,069
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	86,000	2,000
Equipment Costs (main equipment)	843,230	19,610
Equipment Costs (BOP)	73,100	1,700
Grid Connection	73,100	1,700
Engineering and Civil Works	129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost	25,284	588
Erection, Installation, Training, Handling & Land Transportation	43,000	1,000
Construction time insurance,1.50 % Equip. Cost	12,642	294
Transferred equipment from sugar mill (old)	387,000	9,000
SUB-TOTAL	1,672,356	38,892
Contingency 5.00% of sub-total	83,618	1,945
Total Investment Costs	1,755,974	40,837
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,900,841**	**44,206**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	646,476	15,034
Equity 2		
Grant		
Loan*	1,254,365	29,171
TOTAL SOURCES OF FUNDS	**1,900,841**	**44,206**
*Loan		
Amount	1,254,365	29,171
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**8.12%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(4,864)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	**Minimum**	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity Rice Husk Price 630 Baht/tonne
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)				2,069	2,172	2,281	2,395	2,515	2,641	2,773	2,911	3,057	3,210	3,370	3,539	3,716	3,901	4,097	4,301	4,516	4,742	4,979	5,228	5,490
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				7,426	7,701	7,988	8,286	8,597	9,056	9,401	9,759	10,133	10,522	11,101	11,533	11,983	12,452	12,942	13,452	13,984	14,539	15,119	15,723	16,353
Cash Flow from Operations				3,793	3,855	3,915	3,974	4,031	4,172	4,225	4,275	4,323	4,367	4,492	4,528	4,560	4,587	4,609	4,625	4,635	4,638	4,634	4,623	4,603
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				1,848	1,910	1,970	2,029	2,086	2,227	2,280	2,330	2,378	2,422	2,547	2,583	2,615	2,642	2,664	2,680	2,690	2,693	2,690	2,678	2,658
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(217)	(231)	(232)	(232)	(462)	(459)	(454)	(446)	(436)	(424)	(409)	(391)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	2,206	2,316	2,351	2,383	2,180	2,205	2,226	2,244	2,257	2,265	2,269	2,267
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,150**	**4,261**	**4,296**	**4,328**	**4,124**	**4,149**	**4,171**	**4,188**	**4,202**	**4,210**	**4,213**	**4,211**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,150**	**4,261**	**4,296**	**4,328**	**4,124**	**4,149**	**4,171**	**4,188**	**4,202**	**4,210**	**4,213**	**4,211**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,150	4,261	4,296	4,328	4,124	4,149	4,171	4,188	4,202	4,210	4,213	4,211
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,150	4,261	4,296	4,328	4,124	4,149	4,171	4,188	4,202	4,210	4,213	4,211
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(4,864)**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	3,793	3,855	3,915	3,974	4,031	4,172	4,225	4,275	4,323	4,367	4,492	4,528	4,560	4,587	4,609	4,625	4,635	4,638	4,634	4,623	4,603
Pre-Tax Project IRR (total)		**8.12%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Rice Husk Price 770 Baht/tonne**
Date:	08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA	
Mill Capacity (input) (tcy)	2,200,000
Type of Residue Produced	bagasse
Residue/Mill Input Ratio	27.00%
Total Bagasse Production (tpy)	594,000
Fuel Required from Other Sources (tpy):	
Bagasse (Phu Viang)	30,000
Rice husk	47,330
Wood bark	10,000
Cane leaves	44,500
Mill Heat Requirement (ton-steam/hr)	
Crushing: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@ 2.5 bar	376.2
Cane-waiting: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@ 2.5 bar	0.0
Remelting: @ 31 bar	0.0
@ 17 bar	0.0
@ 8 bar	0.0
@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling	0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting	0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting	0.0
Mill Power Requirement (kW)	
Crushing	30,140
Cane-waiting	0
Remelting 1	6,000
Remelting 2	6,000
Off-milling/off-remelting	800
Crushing Duration (hr/yr)	2,315
Cane-waiting Duration (hr/yr)	0
Remelting 1 Duration (hr/yr)	2,644
Remelting Duration 2 (hr/yr)	2,241
Pure Power Generation (hr/yr)	720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	770.0000	17.9070
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		95,594	2,223
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	86,000	2,000
Equipment Costs (main equipment)	843,230	19,610
Equipment Costs (BOP)	73,100	1,700
Grid Connection	73,100	1,700
Engineering and Civil Works	129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost	25,284	588
Erection, Installation, Training, Handling & Land Transportation	43,000	1,000
Construction time insurance,1.50 % Equip. Cost	12,642	294
Transferred equipment from sugar mill (old)	387,000	9,000
SUB-TOTAL	1,672,356	38,892
Contingency 5.00% of sub-total	83,618	1,945
Total Investment Costs	1,755,974	40,837
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,900,841**	**44,206**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	646,476	15,034
Equity 2		
Grant		
Loan*	1,254,365	29,171
TOTAL SOURCES OF FUNDS	**1,900,841**	**44,206**
*Loan		
Amount	1,254,365	29,171
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**7.46%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(6,452)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	**Minimum**	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: **Phu Kieo Bioenergy Co., Ltd.**
Project: **Phu Kieo Bioenergy Cogeneration Plant**
Configuration: **120 tph biomass-fired boilers**
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: **Sugar Mill to provide bagasse + raw water + land lease**
Sugar Mill to get steam and electricity
Case: **sensitivity Rice Husk Price 770 Baht/tonne**
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)				2,223	2,334	2,451	2,574	2,702	2,837	2,979	3,128	3,285	3,449	3,621	3,802	3,992	4,192	4,402	4,622	4,853	5,095	5,350	5,618	5,899
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				7,580	7,863	8,158	8,464	8,784	9,253	9,607	9,976	10,360	10,761	11,352	11,796	12,260	12,743	13,247	13,772	14,321	14,893	15,489	16,112	16,762
Cash Flow from Operations				3,639	3,693	3,745	3,795	3,843	3,975	4,018	4,058	4,095	4,128	4,241	4,264	4,283	4,296	4,303	4,304	4,298	4,285	4,263	4,233	4,194
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				1,694	1,748	1,800	1,851	1,899	2,031	2,074	2,114	2,150	2,183	2,296	2,320	2,338	2,352	2,359	2,360	2,354	2,340	2,319	2,289	2,249
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(181)	(193)	(192)	(190)	(375)	(368)	(358)	(345)	(330)	(313)	(292)	(269)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	2,002	2,103	2,127	2,148	1,976	1,991	2,002	2,008	2,010	2,006	1,996	1,980
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,947**	**4,047**	**4,072**	**4,093**	**3,921**	**3,936**	**3,947**	**3,953**	**3,954**	**3,950**	**3,941**	**3,925**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,947**	**4,047**	**4,072**	**4,093**	**3,921**	**3,936**	**3,947**	**3,953**	**3,954**	**3,950**	**3,941**	**3,925**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,947	4,047	4,072	4,093	3,921	3,936	3,947	3,953	3,954	3,950	3,941	3,925
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,947	4,047	4,072	4,093	3,921	3,936	3,947	3,953	3,954	3,950	3,941	3,925
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(6,452)**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	3,639	3,693	3,745	3,795	3,843	3,975	4,018	4,058	4,095	4,128	4,241	4,264	4,283	4,296	4,303	4,304	4,298	4,285	4,263	4,233	4,194
Pre-Tax Project IRR (total)		**7.46%**																						
DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity Rice Husk Price 840 Baht/tonne
Date: 08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	840.0000	19.5349
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	32,072	746
O&M, % of EPC cost (Yr 6-10)	4.00%	36,653	852
O&M, % of EPC cost (Yr 11 onwards)	4.50%	41,235	959
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		98,907	2,300
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,841	345

USES OF FUNDS		1,000 Baht	1,000 US$
Investment Costs			
Development Costs		86,000	2,000
Equipment Costs (main equipment)		843,230	19,610
Equipment Costs (BOP)		73,100	1,700
Grid Connection		73,100	1,700
Engineering and Civil Works		129,000	3,000
Import Duty, @ 5.00% of Foreign EPC Cost		25,284	588
Erection, Installation, Training, Handling & Land Transportation		43,000	1,000
Construction time insurance,1.50 % Equip. Cost		12,642	294
Transferred equipment from sugar mill (old)		387,000	9,000
SUB-TOTAL		1,672,356	38,892
Contingency	5.00% of sub-total	83,618	1,945
Total Investment Costs		1,755,974	40,837
Financing Costs during Construction			
Interest Costs		135,450	3,150
Other Financing Expenses		9,417	219
Total Financing Costs during Construction		144,867	3,369
TOTAL USES OF FUNDS (Project Cost)		**1,900,841**	**44,206**

SOURCES OF FUNDS		1,000 Baht	1,000 US$
Equity 1	34.01% of investment cost	646,476	15,034
Equity 2			
Grant			
Loan*		1,254,365	29,171
TOTAL SOURCES OF FUNDS		**1,900,841**	**44,206**
*Loan			
Amount		1,254,365	29,171
Grace Period			2
Maturity			9
Base Interest Rate			9.00%
Lender's Margin			1.00%
All-in Interest Rate			10.00%
Financing Fees			0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**7.11%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(7,246)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	Minimum	Average
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)
Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: **Phu Kieo Bioenergy Co., Ltd.**
Project: **Phu Kieo Bioenergy Cogeneration Plant**
Configuration: **120 tph biomass-fired boilers**
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: **Sugar Mill to provide bagasse + raw water + land lease**
Sugar Mill to get steam and electricity
Case: **sensitivity Rice Husk Price 840 Baht/tonne**
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				746	783	822	863	907	1,088	1,142	1,199	1,259	1,322	1,562	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)				2,300	2,415	2,536	2,663	2,796	2,936	3,082	3,237	3,398	3,568	3,747	3,934	4,131	4,337	4,554	4,782	5,021	5,272	5,536	5,812	6,103
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345	345
Total operating expenses				7,657	7,944	8,243	8,554	8,878	9,352	9,710	10,084	10,474	10,880	11,478	11,928	12,398	12,888	13,399	13,932	14,489	15,069	15,675	16,307	16,967
Cash Flow from Operations				3,562	3,612	3,660	3,706	3,750	3,877	3,915	3,950	3,981	4,008	4,115	4,133	4,145	4,151	4,151	4,144	4,130	4,108	4,078	4,038	3,989
Less Depreciation				(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)	(1,945)
Operating Profit (Loss) Before Interest & Tax				1,617	1,667	1,715	1,761	1,805	1,932	1,970	2,005	2,036	2,064	2,171	2,188	2,200	2,206	2,206	2,200	2,186	2,164	2,133	2,094	2,045
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(163)	(175)	(173)	(170)	(332)	(322)	(310)	(295)	(277)	(257)	(234)	(207)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	1,901	1,996	2,015	2,030	1,875	1,884	1,890	1,891	1,886	1,876	1,860	1,837
Add Depreciation				1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945	1,945
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,845**	**3,941**	**3,960**	**3,975**	**3,819**	**3,829**	**3,835**	**3,835**	**3,831**	**3,821**	**3,805**	**3,782**
Capital Expenditure		(13,476)	(27,361)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(13,476)**	**(27,361)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,845**	**3,941**	**3,960**	**3,975**	**3,819**	**3,829**	**3,835**	**3,835**	**3,831**	**3,821**	**3,805**	**3,782**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(13,476)**	**(40,837)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,845	3,941	3,960	3,975	3,819	3,829	3,835	3,835	3,831	3,821	3,805	3,782
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,583)	(9,305)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,845	3,941	3,960	3,975	3,819	3,829	3,835	3,835	3,831	3,821	3,805	3,782
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(7,246)**																						
Cash Flow Before Interest and Tax		(13,476)	(27,361)	3,562	3,612	3,660	3,706	3,750	3,877	3,915	3,950	3,981	4,008	4,115	4,133	4,145	4,151	4,151	4,144	4,130	4,108	4,078	4,038	3,989
Pre-Tax Project IRR (total)		**7.11%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,055																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity Investment Cost -10%
Date: 08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	28,864	671
O&M, % of EPC cost (Yr 6-10)	4.00%	32,988	767
O&M, % of EPC cost (Yr 11 onwards)	4.50%	37,111	863
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	13,357	311

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	77,400	1,800
Equipment Costs (main equipment)	758,907	17,649
Equipment Costs (BOP)	65,790	1,530
Grid Connection	65,790	1,530
Engineering and Civil Works	116,100	2,700
Import Duty, @ 5.00% of Foreign EPC Cost	22,756	529
Erection, Installation, Training, Handling & Land Transportation	38,700	900
Construction time insurance,1.50 % Equip. Cost	11,378	265
Transferred equipment from sugar mill (old)	348,300	8,100
SUB-TOTAL	1,505,120	35,003
Contingency 5.00% of sub-total	75,256	1,750
Total Investment Costs	1,580,376	36,753
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,725,243**	**40,122**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	586,755	13,645
Equity 2		
Grant		
Loan*	1,138,488	26,476
TOTAL SOURCES OF FUNDS	**1,725,243**	**40,122**
*Loan		
Amount	1,138,488	26,476
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**9.57%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(1,038)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	**Minimum**	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)
Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity Investment Cost -10%
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Revenues												
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312
Electricity sales- MPB				749	772	795	819	843	869	895	922	949
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187
Steam sales (RM2)				439	452	465	479	494	509	524	540	556
NEPO incentive				0	0	0	0	0				
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455
Operating Expenses												
Administration				279	293	308	323	339	356	374	393	412
O&M				671	705	740	777	816	979	1,028	1,079	1,133
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,609	2,739	2,876	3,020	3,171
Land lease				424	437	450	464	478	492	507	522	538
Raw Water				71	73	75	78	80	82	85	87	90
Purchase from EGAT				38	40	42	44	46	49	51	54	56
Insurance				311	311	311	311	311	311	311	311	311
Total operating expenses				7,394	7,669	7,956	8,254	8,565	9,012	9,355	9,713	10,086
Cash Flow from Operations				3,825	3,886	3,947	4,005	4,062	4,217	4,270	4,321	4,369
Less Depreciation				(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)
Operating Profit (Loss) Before Interest & Tax				2,075	2,136	2,196	2,255	2,312	2,467	2,520	2,571	2,619
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138
Add Depreciation				1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**
Capital Expenditure		(12,128)	(24,624)									
Salvage Value												
Net Cash Flow Before Interest & Debt Service		**(12,128)**	**(24,624)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(12,128)**	**(36,753)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**										
Nominal Post -Tax IRR (project)		**7.42%**										
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)
Equity Cash Flow		(4,125)	(8,375)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)
Equity IRR (Post-Tax)		**5.01%**										
Net Present Value (NPV total project @)	10.00%	**(1,038)**										
Cash Flow Before Interest and Tax		(12,128)	(24,624)	3,825	3,886	3,947	4,005	4,062	4,217	4,270	4,321	4,369
Pre-Tax Project IRR (total)		**9.57%**										

IndexationYear	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues												
Energy payment - EGAT	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive												
Total revenues	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses												
Administration	433	455	477	501	526	553	580	609	640	672	705	740
O&M	1,190	1,406	1,476	1,550	1,627	1,709	1,794	1,884	1,978	2,077	2,181	2,290
Fuel (bagasse)	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)	3,329	3,496	3,671	3,854	4,047	4,249	4,462	4,685	4,919	5,165	5,423	5,694
Land lease	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT	59	62	65	69	72	76	79	83	88	92	96	101
Insurance	311	311	311	311	311	311	311	311	311	311	311	311
Total operating expenses	10,475	11,036	11,466	11,915	12,382	12,870	13,378	13,909	14,462	15,039	15,641	16,269
Cash Flow from Operations	4,414	4,557	4,595	4,628	4,657	4,680	4,698	4,710	4,716	4,714	4,705	4,687
Less Depreciation	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)	(1,750)
Operating Profit (Loss) Before Interest & Tax	2,664	2,807	2,845	2,878	2,907	2,930	2,948	2,960	2,966	2,964	2,955	2,937
Less Corporate Tax	(253)	(270)	(271)	(271)	(542)	(539)	(534)	(527)	(518)	(506)	(492)	(475)
Income After Tax	2,411	2,537	2,574	2,607	2,365	2,391	2,414	2,433	2,448	2,458	2,462	2,462
Add Depreciation	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750
Operating Cash Flow	**4,161**	**4,287**	**4,324**	**4,357**	**4,115**	**4,141**	**4,164**	**4,183**	**4,198**	**4,208**	**4,213**	**4,212**
Capital Expenditure												
Salvage Value												
Net Cash Flow Before Interest & Debt Service	**4,161**	**4,287**	**4,324**	**4,357**	**4,115**	**4,141**	**4,164**	**4,183**	**4,198**	**4,208**	**4,213**	**4,212**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Less Interest Expense	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow	4,161	4,287	4,324	4,357	4,115	4,141	4,164	4,183	4,198	4,208	4,213	4,212
CUM. NET FINANCING CASH FLOW	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow	4,161	4,287	4,324	4,357	4,115	4,141	4,164	4,183	4,198	4,208	4,213	4,212
Cash Flow Before Interest and Tax	4,414	4,557	4,595	4,628	4,657	4,680	4,698	4,710	4,716	4,714	4,705	4,687

DEBT SERVICE		1	2	3	4	5	6	7	8	9	10	11
Overall interest rate		10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759
Debt Drawdown		0	16,250									
Interest During Construction		667	2,330									
Other Financing Expenses		202										
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**
DEBT SERVICE COVERAGE RATIOS												
Pre-Tax Cash Flow Coverage												
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80
After-Tax Cash Flow Coverage												
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41

DEBT SERVICE	12	13	14	15	16	17	18	19	20	21	22	23
Overall interest rate	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown												
Interest During Construction												
Other Financing Expenses												
Repayment of Principal	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
DEBT SERVICE COVERAGE RATIOS												
Pre-Tax Cash Flow Coverage												
of Interest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage												
of Interest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Investment Cost -5%**
Date:	08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	30,468	709
O&M, % of EPC cost (Yr 6-10)	4.00%	34,821	810
O&M, % of EPC cost (Yr 11 onwards)	4.50%	39,173	911
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	14,099	328

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	81,700	1,900
Equipment Costs (main equipment)	801,069	18,630
Equipment Costs (BOP)	69,445	1,615
Grid Connection	69,445	1,615
Engineering and Civil Works	122,550	2,850
Import Duty, @ 5.00% of Foreign EPC Cost	24,020	559
Erection, Installation, Training, Handling & Land Transportation	40,850	950
Construction time insurance,1.50 % Equip. Cost	12,010	279
Transferred equipment from sugar mill (old)	367,650	8,550
SUB-TOTAL	1,588,738	36,947
Contingency 5.00% of sub-total	79,437	1,847
Total Investment Costs	1,668,175	38,795
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**1,813,042**	**42,164**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	616,616	14,340
Equity 2		
Grant		
Loan*	1,196,426	27,824
TOTAL SOURCES OF FUNDS	**1,813,042**	**42,164**
*Loan		
Amount	1,196,426	27,824
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**8.65%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(3,348)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	**Minimum**	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Investment Cost -5%**
Date:	08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				709	744	781	820	861	1,034	1,085	1,139	1,196	1,256	1,484	1,558	1,636	1,718	1,804	1,894	1,989	2,088	2,192	2,302	2,417
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,609	2,739	2,876	3,020	3,171	3,329	3,496	3,671	3,854	4,047	4,249	4,462	4,685	4,919	5,165	5,423	5,694
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328	328
Total operating expenses				7,449	7,726	8,014	8,315	8,628	9,083	9,429	9,790	10,166	10,558	11,131	11,565	12,018	12,490	12,982	13,495	14,030	14,589	15,171	15,779	16,413
Cash Flow from Operations				3,771	3,830	3,888	3,945	3,999	4,145	4,196	4,244	4,289	4,331	4,462	4,495	4,525	4,549	4,568	4,581	4,588	4,589	4,581	4,566	4,543
Less Depreciation				(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)	(1,847)
Operating Profit (Loss) Before Interest & Tax				1,923	1,983	2,041	2,097	2,152	2,298	2,349	2,397	2,442	2,483	2,614	2,648	2,677	2,702	2,721	2,734	2,741	2,741	2,734	2,719	2,695
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(226)	(241)	(242)	(241)	(480)	(476)	(470)	(462)	(451)	(437)	(421)	(402)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	2,258	2,373	2,406	2,436	2,221	2,245	2,264	2,280	2,290	2,297	2,297	2,293
Add Depreciation				1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,105**	**4,221**	**4,254**	**4,283**	**4,069**	**4,092**	**4,112**	**4,127**	**4,138**	**4,144**	**4,145**	**4,140**
Capital Expenditure		(12,802)	(25,992)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(12,802)**	**(25,992)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**4,105**	**4,221**	**4,254**	**4,283**	**4,069**	**4,092**	**4,112**	**4,127**	**4,138**	**4,144**	**4,145**	**4,140**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(12,802)**	**(38,795)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,105	4,221	4,254	4,283	4,069	4,092	4,112	4,127	4,138	4,144	4,145	4,140
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,354)	(8,840)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	4,105	4,221	4,254	4,283	4,069	4,092	4,112	4,127	4,138	4,144	4,145	4,140
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(3,348)**																						
Cash Flow Before Interest and Tax		(12,802)	(25,992)	3,771	3,830	3,888	3,945	3,999	4,145	4,196	4,244	4,289	4,331	4,462	4,495	4,525	4,549	4,568	4,581	4,588	4,589	4,581	4,566	4,543
Pre-Tax Project IRR (total)		**8.65%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	17,152																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Investment Cost +5%**
Date:	08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	33,675	783
O&M, % of EPC cost (Yr 6-10)	4.00%	38,486	895
O&M, % of EPC cost (Yr 11 onwards)	4.50%	43,297	1,007
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	15,584	362

USES OF FUNDS		1,000 Baht	1,000 US$
Investment Costs			
Development Costs		90,300	2,100
Equipment Costs (main equipment)		885,392	20,591
Equipment Costs (BOP)		76,755	1,785
Grid Connection		76,755	1,785
Engineering and Civil Works		135,450	3,150
Import Duty, @ 5.00% of Foreign EPC Cost		26,548	617
Erection, Installation, Training, Handling & Land Transportation		45,150	1,050
Construction time insurance,1.50 % Equip. Cost		13,274	309
Transferred equipment from sugar mill (old)		406,350	9,450
SUB-TOTAL		1,755,974	40,837
Contingency	5.00% of sub-total	87,799	2,042
Total Investment Costs		1,843,772	42,878
Financing Costs during Construction			
Interest Costs		135,450	3,150
Other Financing Expenses		9,417	219
Total Financing Costs during Construction		144,867	3,369
TOTAL USES OF FUNDS (Project Cost)		**1,988,639**	**46,247**

SOURCES OF FUNDS		1,000 Baht	1,000 US$
Equity 1	34.01% of investment cost	676,336	15,729
Equity 2			
Grant			
Loan*		1,312,303	30,519
TOTAL SOURCES OF FUNDS		**1,988,639**	**46,247**
*Loan			
Amount		1,312,303	30,519
Grace Period			2
Maturity			9
Base Interest Rate			9.00%
Lender's Margin			1.00%
All-in Interest Rate			10.00%
Financing Fees			0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**6.98%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(7,967)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios	**Minimum**	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Investment Cost +5%**
Date:	08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				783	822	863	907	952	1,142	1,199	1,259	1,322	1,388	1,640	1,722	1,808	1,899	1,994	2,093	2,198	2,308	2,423	2,544	2,672
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,609	2,739	2,876	3,020	3,171	3,329	3,496	3,671	3,854	4,047	4,249	4,462	4,685	4,919	5,165	5,423	5,694
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				362	362	362	362	362	362	362	362	362	362	362	362	362	362	362	362	362	362	362	362	362
Total operating expenses				7,558	7,839	8,131	8,436	8,753	9,226	9,578	9,945	10,327	10,725	11,322	11,764	12,225	12,705	13,206	13,729	14,274	14,843	15,437	16,056	16,702
Cash Flow from Operations				3,661	3,717	3,771	3,824	3,874	4,002	4,047	4,089	4,128	4,164	4,271	4,297	4,318	4,334	4,344	4,348	4,345	4,334	4,316	4,289	4,254
Less Depreciation				(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)	(2,042)
Operating Profit (Loss) Before Interest & Tax				1,620	1,675	1,730	1,782	1,832	1,960	2,005	2,048	2,087	2,122	2,229	2,255	2,276	2,292	2,302	2,306	2,303	2,292	2,274	2,248	2,212
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(172)	(183)	(183)	(181)	(357)	(351)	(341)	(330)	(316)	(300)	(280)	(257)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	1,951	2,046	2,072	2,095	1,935	1,951	1,964	1,973	1,976	1,975	1,968	1,954
Add Depreciation				2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042	2,042
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,992**	**4,088**	**4,114**	**4,137**	**3,976**	**3,993**	**4,006**	**4,015**	**4,018**	**4,017**	**4,009**	**3,996**
Capital Expenditure		(14,150)	(28,729)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(14,150)**	**(28,729)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,992**	**4,088**	**4,114**	**4,137**	**3,976**	**3,993**	**4,006**	**4,015**	**4,018**	**4,017**	**4,009**	**3,996**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(14,150)**	**(42,878)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,992	4,088	4,114	4,137	3,976	3,993	4,006	4,015	4,018	4,017	4,009	3,996
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(4,812)	(9,771)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,992	4,088	4,114	4,137	3,976	3,993	4,006	4,015	4,018	4,017	4,009	3,996
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(7,967)**																						
Cash Flow Before Interest and Tax		(14,150)	(28,729)	3,661	3,717	3,771	3,824	3,874	4,002	4,047	4,089	4,128	4,164	4,271	4,297	4,318	4,334	4,344	4,348	4,345	4,334	4,316	4,289	4,254
Pre-Tax Project IRR (total)		**6.98%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	18,958																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

COMPANY NAME:	**Phu Kieo Bioenergy Co., Ltd.**
Project:	**Phu Kieo Bioenergy Cogeneration Plant**
Configuration:	**120 tph biomass-fired boilers**
	26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Condition:	**Sugar Mill to provide bagasse + raw water + land lease**
	Sugar Mill to get steam and electricity
Case:	**sensitivity Investment Cost +10%**
Date:	08/16/02 (Revision 4)

ASSUMPTIONS AND RESULTS

MILL DATA		
Mill Capacity (input) (tcy)		2,200,000
Type of Residue Produced		bagasse
Residue/Mill Input Ratio		27.00%
Total Bagasse Production (tpy)		594,000
Fuel Required from Other Sources (tpy):		
Bagasse (Phu Viang)		30,000
Rice husk		47,330
Wood bark		10,000
Cane leaves		44,500
Mill Heat Requirement (ton-steam/hr)		
Crushing:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	376.2
Cane-waiting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@ 2.5 bar	0.0
Remelting:	@ 31 bar	0.0
	@ 17 bar	0.0
	@ 8 bar	0.0
	@2.5 bar	129.5
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - milling		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - cane-waiting		0.0
Steam Exhaust from Drives (ton-steam/hr@2.5 bar) - remelting		0.0
Mill Power Requirement (kW)		
Crushing		30,140
Cane-waiting		0
Remelting 1		6,000
Remelting 2		6,000
Off-milling/off-remelting		800
Crushing Duration (hr/yr)		2,315
Cane-waiting Duration (hr/yr)		0
Remelting 1 Duration (hr/yr)		2,644
Remelting Duration 2 (hr/yr)		2,241
Pure Power Generation (hr/yr)		720

ENERGY PLANT DATA	
Fuel Data:	
Bagasse	
Moisture Content (wet basis)	50.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Rice husk	
Moisture Content (wet basis)	12.00%
Lower Heating Value (LHV)(MJ/kg)	11.70
Wood bark	
Moisture Content (wet basis)	55.00%
Lower Heating Value (LHV)(MJ/kg)	7.32
Cane leaves	
Moisture Content (wet basis)	24.00%
Lower Heating Value (LHV)(MJ/kg)	12.50
Plant Performance:	
Plant Total Operation (hr/yr)	7,920
Parasitic Load (crushing)	2,920
Parasitic Load (cane waiting)	0
Parasitic Load (remelting)	2,400
Parasitic Load (pure power generation)	2,300
Transmission Loss	2.00%
Overall Grid Off-take in a Year (year 1-5)	62.56%
Overall Grid Off-take in a Year (year 6-10)	64.54%
Overall Grid Off-take in a Year (year 11-21)	66.52%
Crushing:	
Plant Capacity (kW)	**55,560**
Load Factor	100.00%
Power Generation (kWh/yr)	128,621,400
Mill Power Requirements (kWh/yr)	69,774,100
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,800,887
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,933,271
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	38,065,654
Cane-waiting:	
Plant Capacity (kW)	**0**
Load Factor	0.00%
Power Generation (kWh/yr)	0
Mill Power Requirements (kWh/yr)	0
Grid Export/Excess Power (kWh/yr) - yr 1- 5	0
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	0
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	0
Remelting 1:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	79,584,400
Mill Power Requirements (kWh/yr)	15,864,000
Grid Export/Excess Power (kWh/yr) - yr 1 - 5	41,991,316
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	43,319,458
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	44,647,601
Remelting 2:	
Plant Capacity (kW)	**30,100**
Load Factor	100.00%
Power Generation (kWh/yr)	67,454,100
Mill Power Requirements (kWh/yr)	13,446,000
Grid Export/Excess Power (kWh/yr) - yr 1 -5	35,590,985
Grid Export/Excess Power (kWh/yr) - yr 6 - 10	36,716,690
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	37,842,394
Pure Power Generation:	
Plant Capacity (kW)	**23,060**
Load Factor	100.00%
Power Generation (kWh/yr)	16,603,200
Mill Power Requirements (kWh/yr)	576,000
Grid Export/Excess Power (kWh/yr) - yr 1- 5	10,491,621
Grid Export/Excess Power (kWh/yr) - yr 6- 10	10,823,572
Grid Export/Excess Power (kWh/yr) - yr 11 - 21	11,155,523
Annual Shutdown/Maintenance:	
Back-up Power Requirements (MW)	1.00
Total Number Days for Annual Maintenance	30

GENERAL DATA	
Plant Life (years)	21
PPA with EGAT (years)	21
Depreciation Policy	straight line
Corporate Tax Rate:	
Year 1-8	0.00%
Year 9-13	15.00%
Year 14 onwards	30.00%

TARIFF	Baht	US$
Energy Payment (Baht/kWh) - EGAT	1.4900	0.0347
Power Capacity Payment (Baht/kW-mo)	442.1053	10.2815
Levelised Electricity Selling Rate (Baht/kWh) - EGAT (RM2+PP)	2.1040	0.0489
Electricity Purchase Price from EGAT (Baht/kWh) - Peak	2.6950	0.0627
Electricity Purchase Price from EGAT (Baht/kWh) - Off-Peak	1.1914	0.0277
Power Demand Charge (Baht/kW-mo)	132.9300	3.0914
Back-up Power Charge for Cogeneration (Baht-kW-mo)	29.4400	0.6847
Service Charge (Baht/mo)	228.1700	5.3063
Levelised Electricity Selling Rate (Baht/kWh) - Sugar Mill (C+CW+RM1	1.1782	0.0274
Steam Selling Rate (Baht/ton) - Sugar Mill (C+CW+RM1)	33.2153	0.7724
Steam Selling Rate (Baht/ton) - Sugar Mill (RM 2)	65.0000	1.5116
Fuel Cost:		
Bagasse - Phu Keaw (Baht/ton)	250.0000	5.8140
Bagasse - Phu Viang (Baht/ton)	700.0000	16.2791
Rice husk (Baht/ton)	700.0000	16.2791
Wood bark (Baht/ton)	700.0000	16.2791
Cane leaves (Baht/ton)	700.0000	16.2791
Natural gas (Baht/million BTU)	151.4518	3.5221
Raw Water (Baht/cu.m.)	6.5000	0.1512
NEPO Incentive (Baht/kWh)	0.0000	0.0000

OPERATING COSTS		1,000 Baht	1,000 US$
Administration		12,000	279
O&M, % of EPC cost (Yr 1-5)	3.50%	35,279	820
O&M, % of EPC cost (Yr 6-10)	4.00%	40,319	938
O&M, % of EPC cost (Yr 11 onwards)	4.50%	45,358	1,055
Fuel (bagasse)		148,500	3,453
Fuel (other biomass)		92,281	2,146
Raw Water (C+CW+RM1)		2,366	55
Raw Water (RM2+PP)		689	16
Land Lease (C+CW+RM1)		10,331	240
Land Lease (RM2+PP)		7,919	184
Purchase from EGAT		1,642	38
Insurance, % of EPC Cost	1.50%	16,326	380

USES OF FUNDS	1,000 Baht	1,000 US$
Investment Costs		
Development Costs	94,600	2,200
Equipment Costs (main equipment)	927,553	21,571
Equipment Costs (BOP)	80,410	1,870
Grid Connection	80,410	1,870
Engineering and Civil Works	141,900	3,300
Import Duty, @ 5.00% of Foreign EPC Cost	27,812	647
Erection, Installation, Training, Handling & Land Transportation	47,300	1,100
Construction time insurance,1.50 % Equip. Cost	13,906	323
Transferred equipment from sugar mill (old)	425,700	9,900
SUB-TOTAL	1,839,592	42,781
Contingency 5.00% of sub-total	91,980	2,139
Total Investment Costs	1,931,571	44,920
Financing Costs during Construction		
Interest Costs	135,450	3,150
Other Financing Expenses	9,417	219
Total Financing Costs during Construction	144,867	3,369
TOTAL USES OF FUNDS (Project Cost)	**2,076,438**	**48,289**

SOURCES OF FUNDS	1,000 Baht	1,000 US$
Equity 1 34.01% of investment cost	706,197	16,423
Equity 2		
Grant		
Loan*	1,370,242	31,866
TOTAL SOURCES OF FUNDS	**2,076,438**	**48,289**
*Loan		
Amount	1,370,242	31,866
Grace Period		2
Maturity		9
Base Interest Rate		9.00%
Lender's Margin		1.00%
All-in Interest Rate		10.00%
Financing Fees		0.75%

ECONOMIC DATA	
Currency Exchange Rate (Baht/US$)	43.00
Average Inflation Rate (Thai CPI)	5.00%
Crude Oil Price Growth Rate	1.00%
Discount Rate	10.00%

PROJECT PERFORMANCE	
Pre-Tax Project IRR	**6.22%**
NPV-Cash Flow Before Interest & Tax (in 1000 US$)	**(10,277)**
Equity IRR	**5.01%**
Pay-back Period (yrs)	**10.29**

Annual Debt Service Coverage Ratios		
	Minimum	**Average**
Pre-Tax Cash Flow Coverage		
of Interest	**1.23**	**1.91**
of Debt Service	**0.71**	**0.75**
After-Tax Cash Flow Coverage		
of Interest	**0.59**	**0.97**
of Debt Service	**0.34**	**0.37**

(Note: all figures in Baht 1000 unless otherwise stated)

Legend: C-crushing; CW-cane waiting; RM1-remelting 1; RM2-remelting 2; PP-pure power generation

COMPANY NAME: Phu Kieo Bioenergy Co., Ltd.
Project: Phu Kieo Bioenergy Cogeneration Plant
Configuration: 120 tph biomass-fired boilers
26 MW extraction-condensing and 12 MW back-pressure turbo-generator, Firm Contract for 21 years
Option 1: Sugar Mill to provide bagasse + raw water + land lease
Sugar Mill to get steam and electricity
Case: sensitivity Investment Cost +10%
Date: 08/16/02

CASH FLOW STATEMENT

IndexationYear		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Operating Year		*-1*	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*
Revenues																								
Energy payment - EGAT				4,292	4,421	4,554	4,690	4,831	5,133	5,287	5,446	5,609	5,778	6,134	6,318	6,507	6,702	6,903	7,110	7,324	7,544	7,770	8,003	8,243
Capacity payment - EGAT				1,769	1,822	1,877	1,933	1,991	2,116	2,179	2,244	2,312	2,381	2,528	2,603	2,682	2,762	2,845	2,930	3,018	3,109	3,202	3,298	3,397
Electricity sales- MPB				749	772	795	819	843	869	895	922	949	978	1,007	1,037	1,069	1,101	1,134	1,168	1,203	1,239	1,276	1,314	1,354
Electricity sales- Sugar Mill (C+CW+RM1)				2,346	2,417	2,489	2,564	2,641	2,720	2,802	2,886	2,972	3,062	3,153	3,248	3,346	3,446	3,549	3,656	3,765	3,878	3,995	4,115	4,238
Electricity sales- Sugar Mill (RM2+PG)				686	707	728	750	772	795	819	844	869	895	922	950	978	1,008	1,038	1,069	1,101	1,134	1,168	1,203	1,239
Steam sales (C+CW+RM1)				937	965	994	1,024	1,055	1,086	1,119	1,153	1,187	1,223	1,260	1,297	1,336	1,376	1,418	1,460	1,504	1,549	1,596	1,643	1,693
Steam sales (RM2)				439	452	465	479	494	509	524	540	556	572	590	607	625	644	664	683	704	725	747	769	792
NEPO incentive				0	0	0	0	0																
Total revenues				11,219	11,556	11,903	12,260	12,627	13,228	13,625	14,034	14,455	14,889	15,593	16,061	16,543	17,039	17,550	18,077	18,619	19,177	19,753	20,345	20,956
Operating Expenses																								
Administration				279	293	308	323	339	356	374	393	412	433	455	477	501	526	553	580	609	640	672	705	740
O&M				820	861	905	950	997	1,197	1,257	1,319	1,385	1,455	1,718	1,804	1,894	1,989	2,089	2,193	2,303	2,418	2,539	2,666	2,799
Fuel (bagasse)				3,453	3,557	3,664	3,774	3,887	4,004	4,124	4,247	4,375	4,506	4,641	4,780	4,924	5,072	5,224	5,380	5,542	5,708	5,879	6,056	6,237
Fuel (other biomass)				2,146	2,253	2,366	2,484	2,609	2,739	2,876	3,020	3,171	3,329	3,496	3,671	3,854	4,047	4,249	4,462	4,685	4,919	5,165	5,423	5,694
Land lease				424	437	450	464	478	492	507	522	538	554	570	587	605	623	642	661	681	701	723	744	767
Raw Water				71	73	75	78	80	82	85	87	90	93	95	98	101	104	107	111	114	117	121	125	128
Purchase from EGAT				38	40	42	44	46	49	51	54	56	59	62	65	69	72	76	79	83	88	92	96	101
Insurance				380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380
Total operating expenses				7,612	7,895	8,189	8,496	8,816	9,298	9,652	10,022	10,407	10,808	11,417	11,863	12,328	12,813	13,318	13,846	14,396	14,970	15,569	16,194	16,847
Cash Flow from Operations				3,607	3,661	3,713	3,763	3,812	3,930	3,973	4,012	4,048	4,081	4,176	4,198	4,215	4,226	4,232	4,231	4,223	4,207	4,183	4,151	4,109
Less Depreciation				(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)	(2,139)
Operating Profit (Loss) Before Interest & Tax				1,468	1,522	1,574	1,624	1,673	1,791	1,834	1,873	1,909	1,942	2,037	2,059	2,076	2,087	2,093	2,092	2,084	2,068	2,044	2,012	1,970
Less Corporate Tax				0	0	0	0	0	0	0	0	(126)	(145)	(154)	(153)	(151)	(296)	(288)	(277)	(264)	(249)	(231)	(209)	(185)
Income After Tax				1,771	1,829	**1,885**	1,940	1,992	2,129	2,177	2,222	2,138	1,797	1,882	1,905	1,925	1,791	1,805	1,814	1,819	1,819	1,814	1,803	1,785
Add Depreciation				2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139	2,139
Operating Cash Flow				**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,936**	**4,021**	**4,044**	**4,064**	**3,930**	**3,944**	**3,953**	**3,958**	**3,958**	**3,953**	**3,942**	**3,924**
Capital Expenditure		(14,824)	(30,097)																					
Salvage Value																								
Net Cash Flow Before Interest & Debt Service		**(14,824)**	**(30,097)**	**3,716**	**3,774**	**3,830**	**3,884**	**3,937**	**4,074**	**4,122**	**4,167**	**4,083**	**3,936**	**4,021**	**4,044**	**4,064**	**3,930**	**3,944**	**3,953**	**3,958**	**3,958**	**3,953**	**3,942**	**3,924**
CUM. NET CASHFLOW BEFORE INT. & DEBT SERVICE		**(14,824)**	**(44,920)**	**(37,121)**	**(33,347)**	**(29,517)**	**(25,632)**	**(21,696)**	**(17,622)**	**(13,500)**	**(9,333)**	**(5,250)**	**(1,202)**	**2,953**	**7,137**	**11,347**	**15,370**	**19,412**	**23,471**	**27,542**	**31,620**	**35,701**	**39,778**	**43,846**
Net Present Value (Post-Tax) - total project @	10.00%	**(6,430)**																						
Nominal Post -Tax IRR (project)		**7.42%**																						
Less Interest Expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Less Debt Repayments				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Net Financing Cash Flow				(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,936	4,021	4,044	4,064	3,930	3,944	3,953	3,958	3,958	3,953	3,942	3,924
CUM. NET FINANCING CASH FLOW				(1,519)	(2,980)	(4,385)	(5,735)	(7,033)	(8,194)	(9,307)	(10,375)	(11,527)	(7,479)	(3,324)	860	5,070	9,093	13,136	17,194	21,265	25,343	29,424	33,501	37,569
Equity Cash Flow		(5,042)	(10,236)	(1,519)	(1,461)	(1,405)	(1,350)	(1,298)	(1,161)	(1,113)	(1,068)	(1,152)	3,936	4,021	4,044	4,064	3,930	3,944	3,953	3,958	3,958	3,953	3,942	3,924
Equity IRR (Post-Tax)		**5.01%**																						
Net Present Value (NPV total project @)	10.00%	**(10,277)**																						
Cash Flow Before Interest and Tax		(14,824)	(30,097)	3,607	3,661	3,713	3,763	3,812	3,930	3,973	4,012	4,048	4,081	4,176	4,198	4,215	4,226	4,232	4,231	4,223	4,207	4,183	4,151	4,109
Pre-Tax Project IRR (total)		**6.22%**																						

DEBT SERVICE																								
Overall interest rate		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%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Debt at beginning of year		0	9,762	30,147	27,927	25,485	22,799	19,844	16,594	13,018	9,085	4,759	0	0	0	0	0	0	0	0	0	0	0	0
Debt Drawdown		0	19,861																					
Interest During Construction		667	2,330																					
Other Financing Expenses		202																						
Repayment of Principal				(2,220)	(2,442)	(2,686)	(2,955)	(3,250)	(3,575)	(3,933)	(4,326)	(4,759)	0	0	0	0	0	0	0	0	0	0	0	0
Debt at the end of the year		**9,762**	**30,147**	**27,927**	**25,485**	**22,799**	**19,844**	**16,594**	**13,018**	**9,085**	**4,759**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Interest expense				(3,015)	(2,793)	(2,549)	(2,280)	(1,984)	(1,659)	(1,302)	(909)	(476)	0	0	0	0	0	0	0	0	0	0	0	0
Total Debt service		**0**	**0**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**(5,235)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DEBT SERVICE COVERAGE RATIOS																								
Pre-Tax Cash Flow Coverage																								
of Interest				1.23	1.35	1.50	1.70	1.98	2.45	3.17	4.59	8.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.71	0.72	0.73	0.74	0.75	0.78	0.79	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
After-Tax Cash Flow Coverage																								
of Interest				0.59	0.65	0.74	0.85	1.00	1.28	1.67	2.45	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
of Debt Service				0.34	0.35	0.36	0.37	0.38	0.41	0.42	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00