

Apéndice - E

Análisis Económico y Financiero

Case-H0(5MW)

Cash Flow for Small Hydropower -5 MW (Case-H0)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
5	50%	4%	12,500	150	5%	70%	8,855	10	8%	10	25%	16,024	37.7%	2.05	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	1,875			1,875			1,875	-1,875	0	-1,875	-1,875	
0			0	1,875	45		1,920			2,274	-2,274	0	-2,274	-4,149	
1	140	21,900	3,066			153	153	886	708	1,747	1,319	0	1,319	-2,830	633
2	145.6	21,900	3,189			159	159	886	638	1,682	1,506	0	1,506	-1,324	633
3	151.4	21,900	3,316			166	166	886	567	1,618	1,698	0	1,698	374	633
4	157.5	21,900	3,449			172	172	886	496	1,554	1,895	0	1,895	2,269	633
5	163.8	21,900	3,587			179	179	886	425	1,490	2,097	0	2,097	4,366	633
6	170.3	21,900	3,730			187	187	886	354	1,426	2,304	0	2,304	6,670	633
7	177.1	21,900	3,879			194	194	886	283	1,363	2,517	0	2,517	9,187	633
8	184.2	21,900	4,035			202	202	886	213	1,300	2,735	0	2,735	11,921	633
9	191.6	21,900	4,196			210	210	886	142	1,237	2,959	0	2,959	14,880	633
10	199.3	21,900	4,364			218	218	886	71	1,175	3,189	0	3,189	18,070	633
11	207.2	21,900	4,538			227	227			227	4,312	920	3,392	21,462	633
12	215.5	21,900	4,720			236	236			236	4,484	963	3,521	24,983	633
13	224.1	21,900	4,909			245	245			245	4,663	1,008	3,656	28,638	633
14	233.1	21,900	5,105			255	255			255	4,850	1,054	3,796	32,434	633
15	242.4	21,900	5,309			265	265			265	5,044	1,103	3,941	36,375	633
16	252.1	21,900	5,522			276	276			276	5,246	1,153	4,092	40,467	633
17	262.2	21,900	5,743			287	287			287	5,455	1,206	4,250	44,717	633
18	272.7	21,900	5,972			299	299			299	5,674	1,260	4,413	49,130	633
19	283.6	21,900	6,211			311	311			311	5,901	1,317	4,584	53,714	633
20	295.0	21,900	6,460			323	323			323	6,137	1,376	4,761	58,474	633
Total		438,000	91,300	3,750	45	4,565	8,360	8,855	4,250	21,465	69,834	11,360	58,474	58,474	

Source: JICA Study Team

31,324

15,301

NPV=

16,024

Case-H1(4MW)

Cash Flow for Small Hydropower -4 MW (Case-H1)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
4	50%	4%	10,000	150	5%	70%	7,105	10	8%	10	25%	12,793	37.5%	2.04	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	1,500			1,500			1,500	-1,500	0	-1,500	-1,500	
0			0	1,500	45		1,545			1,829	-1,829	0	-1,829	-3,329	
1	140	17,520	2,453			123	123	711	568	1,402	1,051	0	1,051	-2,278	508
2	145.6	17,520	2,551			128	128	711	512	1,350	1,201	0	1,201	-1,077	508
3	151.4	17,520	2,653			133	133	711	455	1,298	1,355	0	1,355	278	508
4	157.5	17,520	2,759			138	138	711	398	1,246	1,513	0	1,513	1,791	508
5	163.8	17,520	2,869			143	143	711	341	1,195	1,674	0	1,674	3,466	508
6	170.3	17,520	2,984			149	149	711	284	1,144	1,840	0	1,840	5,306	508
7	177.1	17,520	3,104			155	155	711	227	1,093	2,011	0	2,011	7,316	508
8	184.2	17,520	3,228			161	161	711	171	1,042	2,185	0	2,185	9,502	508
9	191.6	17,520	3,357			168	168	711	114	992	2,365	0	2,365	11,867	508
10	199.3	17,520	3,491			175	175	711	57	942	2,549	0	2,549	14,416	508
11	207.2	17,520	3,631			182	182			182	3,449	735	2,714	17,130	508
12	215.5	17,520	3,776			189	189			189	3,587	770	2,817	19,947	508
13	224.1	17,520	3,927			196	196			196	3,731	806	2,925	22,872	508
14	233.1	17,520	4,084			204	204			204	3,880	843	3,037	25,908	508
15	242.4	17,520	4,247			212	212			212	4,035	882	3,153	29,062	508
16	252.1	17,520	4,417			221	221			221	4,196	922	3,274	32,336	508
17	262.2	17,520	4,594			230	230			230	4,364	964	3,400	35,736	508
18	272.7	17,520	4,778			239	239			239	4,539	1,008	3,531	39,267	508
19	283.6	17,520	4,969			248	248			248	4,720	1,053	3,667	42,934	508
20	295.0	17,520	5,168			258	258			258	4,909	1,100	3,809	46,743	508
Total		350,400	73,040	3,000	45	3,652	6,697	7,105	3,410	17,212	55,827	9,084	46,743	46,743	

Source: JICA Study Team

25,060

12,266

NPV=

12,793

Case-H2(3MW)

Cash Flow for Small Hydropower -3 MW (Case-H2)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
3	50%	4%	7,500	150	5%	70%	5,355	10	8%	10	25%	9,563	37.3%	2.04	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	1,125			1,125			1,125	-1,125	0	-1,125	-1,125	
0			0	1,125	45		1,170		214	1,384	-1,384	0	-1,384	-2,509	
1	140	13,140	1,840			92	92	536	428	1,056	784	0	784	-1,725	383
2	145.6	13,140	1,913			96	96	536	386	1,017	896	0	896	-829	383
3	151.4	13,140	1,990			99	99	536	343	978	1,012	0	1,012	183	383
4	157.5	13,140	2,069			103	103	536	300	939	1,130	0	1,130	1,313	383
5	163.8	13,140	2,152			108	108	536	257	900	1,252	0	1,252	2,565	383
6	170.3	13,140	2,238			112	112	536	214	862	1,377	0	1,377	3,942	383
7	177.1	13,140	2,328			116	116	536	171	823	1,504	0	1,504	5,446	383
8	184.2	13,140	2,421			121	121	536	129	785	1,636	0	1,636	7,082	383
9	191.6	13,140	2,518			126	126	536	86	747	1,771	0	1,771	8,853	383
10	199.3	13,140	2,618			131	131	536	43	709	1,909	0	1,909	10,762	383
11	207.2	13,140	2,723			136	136			136	2,587	551	2,036	12,798	383
12	215.5	13,140	2,832			142	142			142	2,690	577	2,113	14,911	383
13	224.1	13,140	2,945			147	147			147	2,798	604	2,194	17,105	383
14	233.1	13,140	3,063			153	153			153	2,910	632	2,278	19,383	383
15	242.4	13,140	3,186			159	159			159	3,026	661	2,365	21,748	383
16	252.1	13,140	3,313			166	166			166	3,147	691	2,456	24,205	383
17	262.2	13,140	3,446			172	172			172	3,273	723	2,551	26,755	383
18	272.7	13,140	3,583			179	179			179	3,404	755	2,649	29,404	383
19	283.6	13,140	3,727			186	186			186	3,540	789	2,751	32,155	383
20	295.0	13,140	3,876			194	194			194	3,682	825	2,857	35,012	383
Total		262,800	54,780	2,250	45	2,739	5,034	5,355	2,570	12,959	41,820	6,808	35,012	35,012	

Source: JICA Study Team

18,795

9,232

NPV=

9,563

Case-H3(2MW)

Cash Flow for Small Hydropower -2 MW (Case-H3)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
2	50%	4%	5,000	150	5%	70%	3,605	10	8%	10	25%	6,332	36.9%	2.02	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	750			750			750	-750	0	-750	-750	
0			0	750	45		795		144	939	-939	0	-939	-1,689	
1	140	8,760	1,226			61	61	361	288	710	516	0	516	-1,173	258
2	145.6	8,760	1,275			64	64	361	260	684	592	0	592	-581	258
3	151.4	8,760	1,326			66	66	361	231	658	669	0	669	88	258
4	157.5	8,760	1,380			69	69	361	202	631	748	0	748	836	258
5	163.8	8,760	1,435			72	72	361	173	605	829	0	829	1,665	258
6	170.3	8,760	1,492			75	75	361	144	579	913	0	913	2,578	258
7	177.1	8,760	1,552			78	78	361	115	553	998	0	998	3,576	258
8	184.2	8,760	1,614			81	81	361	87	528	1,086	0	1,086	4,662	258
9	191.6	8,760	1,678			84	84	361	58	502	1,176	0	1,176	5,839	258
10	199.3	8,760	1,746			87	87	361	29	477	1,269	0	1,269	7,108	258
11	207.2	8,760	1,815			91	91			91	1,725	367	1,358	8,466	258
12	215.5	8,760	1,888			94	94			94	1,794	384	1,410	9,875	258
13	224.1	8,760	1,964			98	98			98	1,865	402	1,463	11,338	258
14	233.1	8,760	2,042			102	102			102	1,940	421	1,519	12,858	258
15	242.4	8,760	2,124			106	106			106	2,018	440	1,578	14,435	258
16	252.1	8,760	2,209			110	110			110	2,098	460	1,638	16,073	258
17	262.2	8,760	2,297			115	115			115	2,182	481	1,701	17,774	258
18	272.7	8,760	2,389			119	119			119	2,269	503	1,766	19,541	258
19	283.6	8,760	2,484			124	124			124	2,360	526	1,835	21,375	258
20	295.0	8,760	2,584			129	129			129	2,455	549	1,905	23,281	258
Total		175,200	36,520	1,500	45	1,826	3,371	3,605	1,730	8,706	27,813	4,533	23,281	23,281	

Source: JICA Study Team

12,530

6,197

NPV=

6,332

Case-H4(1MW)

Cash Flow for Small Hydropower -1MW (Case-H4)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
1	50%	4%	3,000	150	5%	70%	2,205	10	8%	10	25%	2,666	28.5%	1.74	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	450			450			450	-450	0	-450	-450	
0			0	450	45		495		88	583	-583	0	-583	-1,033	
1	140	4,380	613			31	31	221	176	428	186	0	186	-848	158
2	145.6	4,380	638			32	32	221	159	411	227	0	227	-621	158
3	151.4	4,380	663			33	33	221	141	395	268	0	268	-353	158
4	157.5	4,380	690			34	34	221	123	378	311	0	311	-41	158
5	163.8	4,380	717			36	36	221	106	362	355	0	355	314	158
6	170.3	4,380	746			37	37	221	88	346	400	0	400	714	158
7	177.1	4,380	776			39	39	221	71	330	446	0	446	1,160	158
8	184.2	4,380	807			40	40	221	53	314	493	0	493	1,653	158
9	191.6	4,380	839			42	42	221	35	298	541	0	541	2,195	158
10	199.3	4,380	873			44	44	221	18	282	591	0	591	2,786	158
11	207.2	4,380	908			45	45			45	862	176	686	3,472	158
12	215.5	4,380	944			47	47			47	897	185	712	4,184	158
13	224.1	4,380	982			49	49			49	933	194	739	4,923	158
14	233.1	4,380	1,021			51	51			51	970	203	767	5,689	158
15	242.4	4,380	1,062			53	53			53	1,009	213	796	6,485	158
16	252.1	4,380	1,104			55	55			55	1,049	223	826	7,312	158
17	262.2	4,380	1,149			57	57			57	1,091	233	858	8,169	158
18	272.7	4,380	1,194			60	60			60	1,135	244	890	9,060	158
19	283.6	4,380	1,242			62	62			62	1,180	256	924	9,984	158
20	295.0	4,380	1,292			65	65			65	1,227	267	960	10,944	158
Total		87,600	18,260	900	45	913	1,858	2,205	1,058	5,121	13,139	2,194	10,944	10,944	

Source: JICA Study Team

6,265

3,599

NPV=

2,666

Case-H5(0.7MW)

Cash Flow for Small Hydropower -0.7 MW (Case-H5)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
0.7	50%	4%	2,100	150	5%	70%	1,575	10	8%	10	25%	1,827	27.8%	1.71	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	315			315			315	-315	0	-315	-315	
0			0	315	45		360		63	423	-423	0	-423	-738	
1	140	3,066	429			21	21	158	126	305	124	0	124	-614	113
2	145.6	3,066	446			22	22	158	113	293	153	0	153	-461	113
3	151.4	3,066	464			23	23	158	101	282	183	0	183	-278	113
4	157.5	3,066	483			24	24	158	88	270	213	0	213	-65	113
5	163.8	3,066	502			25	25	158	76	258	244	0	244	179	113
6	170.3	3,066	522			26	26	158	63	247	276	0	276	455	113
7	177.1	3,066	543			27	27	158	50	235	308	0	308	763	113
8	184.2	3,066	565			28	28	158	38	224	341	0	341	1,104	113
9	191.6	3,066	587			29	29	158	25	212	375	0	375	1,480	113
10	199.3	3,066	611			31	31	158	13	201	410	0	410	1,890	113
11	207.2	3,066	635			32	32			32	604	123	481	2,371	113
12	215.5	3,066	661			33	33			33	628	129	499	2,870	113
13	224.1	3,066	687			34	34			34	653	135	518	3,387	113
14	233.1	3,066	715			36	36			36	679	142	537	3,925	113
15	242.4	3,066	743			37	37			37	706	148	558	4,482	113
16	252.1	3,066	773			39	39			39	734	155	579	5,061	113
17	262.2	3,066	804			40	40			40	764	163	601	5,662	113
18	272.7	3,066	836			42	42			42	794	170	624	6,286	113
19	283.6	3,066	870			43	43			43	826	178	648	6,934	113
20	295.0	3,066	904			45	45			45	859	187	672	7,606	113
Total		61,320	12,782	630	45	639	1,314	1,575	756	3,645	9,137	1,531	7,606	7,606	

Source: JICA Study Team

4,385

2,558

NPV=

1,827

Case-H6(0.5MW)

Cash Flow for Small Hydropower - 0.5 MW (Case-H6)

Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i-j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
				Power Plant	Inter-Connection Cost			Principal Repayment	Interest						
0			0	225			225			225	-225	0	-225	-225	
0			0	225	45		270			46	-316	0	-316	-541	
1	140	2,190	307			15	15	116	92	223	83	0	83	-458	83
2	145.6	2,190	319			16	16	116	83	215	104	0	104	-354	83
3	151.4	2,190	332			17	17	116	74	206	126	0	126	-228	83
4	157.5	2,190	345			17	17	116	65	197	147	0	147	-80	83
5	163.8	2,190	359			18	18	116	55	189	170	0	170	89	83
6	170.3	2,190	373			19	19	116	46	180	193	0	193	282	83
7	177.1	2,190	388			19	19	116	37	172	216	0	216	498	83
8	184.2	2,190	403			20	20	116	28	163	240	0	240	738	83
9	191.6	2,190	420			21	21	116	18	155	265	0	265	1,003	83
10	199.3	2,190	436			22	22	116	9	147	290	0	290	1,293	83
11	207.2	2,190	454			23	23			23	431	87	344	1,637	83
12	215.5	2,190	472			24	24			24	448	91	357	1,994	83
13	224.1	2,190	491			25	25			25	466	96	370	2,364	83
14	233.1	2,190	511			26	26			26	485	101	384	2,748	83
15	242.4	2,190	531			27	27			27	504	105	399	3,147	83
16	252.1	2,190	552			28	28			28	525	111	414	3,561	83
17	262.2	2,190	574			29	29			29	546	116	430	3,991	83
18	272.7	2,190	597			30	30			30	567	121	446	4,437	83
19	283.6	2,190	621			31	31			31	590	127	463	4,900	83
20	295.0	2,190	646			32	32			32	614	133	481	5,381	83
Total		43,800	9,130	450	45	456	951	1,155	554	2,661	6,469	1,088	5,381	5,381	

Source: JICA Study Team

3,132

1,864

NPV=

1,268

Case-H7(0.3MW)

Cash Flow for Small Hydropower -0.3 MW (Case-H7)

Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i-j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
				Power Plant	Inter-Connection Cost			Principal Repayment	Interest						
0			0	135			135			135	-135	0	-135	-135	
0			0	135	45		180			29	-209	0	-209	-344	
1	140	1,314	184			9	9	74	59	141	42	0	42	-302	53
2	145.6	1,314	191			10	10	74	53	136	55	0	55	-247	53
3	151.4	1,314	199			10	10	74	47	130	68	0	68	-178	53
4	157.5	1,314	207			10	10	74	41	125	82	0	82	-96	53
5	163.8	1,314	215			11	11	74	35	120	96	0	96	-1	53
6	170.3	1,314	224			11	11	74	29	114	110	0	110	109	53
7	177.1	1,314	233			12	12	74	24	109	124	0	124	233	53
8	184.2	1,314	242			12	12	74	18	103	139	0	139	372	53
9	191.6	1,314	252			13	13	74	12	98	154	0	154	526	53
10	199.3	1,314	262			13	13	74	6	92	169	0	169	695	53
11	207.2	1,314	272			14	14			14	259	52	207	903	53
12	215.5	1,314	283			14	14			14	269	54	215	1,117	53
13	224.1	1,314	295			15	15			15	280	57	223	1,340	53
14	233.1	1,314	306			15	15			15	291	60	231	1,572	53
15	242.4	1,314	319			16	16			16	303	63	240	1,812	53
16	252.1	1,314	331			17	17			17	315	66	249	2,061	53
17	262.2	1,314	345			17	17			17	327	69	259	2,320	53
18	272.7	1,314	358			18	18			18	340	72	268	2,588	53
19	283.6	1,314	373			19	19			19	354	75	279	2,867	53
20	295.0	1,314	388			19	19			19	368	79	289	3,156	53
Total		26,280	5,478	270	45	274	589	735	353	1,677	3,801	645	3,156	3,156	

Source: JICA Study Team

1,879

1,170

NPV=

710

Case-H8(0.2MW)

Cash Flow for Small Hydropower -0.2 MW (Case-H8)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter-Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayment Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
0.2	50%	4%	600	150	5%	70%	525	10	8%	10	25%	430	22.6%	1.52	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	g) Loan (\$000)		h) Total Cost (f+g) (\$000)	i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i-j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	90			90			90	-90	0	-90	-90	
0			0	90	45		135			156	-156	0	-156	-246	
1	140	876	123			6	6	53	42	101	22	0	22	-224	38
2	145.6	876	128			6	6	53	38	97	31	0	31	-193	38
3	151.4	876	133			7	7	53	34	93	40	0	40	-153	38
4	157.5	876	138			7	7	53	29	89	49	0	49	-104	38
5	163.8	876	143			7	7	53	25	85	59	0	59	-45	38
6	170.3	876	149			7	7	53	21	81	68	0	68	23	38
7	177.1	876	155			8	8	53	17	77	78	0	78	101	38
8	184.2	876	161			8	8	53	13	73	88	0	88	189	38
9	191.6	876	168			8	8	53	8	69	99	0	99	288	38
10	199.3	876	175			9	9	53	4	65	109	0	109	397	38
11	207.2	876	182			9	9			9	172	34	139	536	38
12	215.5	876	189			9	9			9	179	35	144	679	38
13	224.1	876	196			10	10			10	187	37	149	829	38
14	233.1	876	204			10	10			10	194	39	155	984	38
15	242.4	876	212			11	11			11	202	41	161	1,144	38
16	252.1	876	221			11	11			11	210	43	167	1,311	38
17	262.2	876	230			11	11			11	218	45	173	1,484	38
18	272.7	876	239			12	12			12	227	47	180	1,664	38
19	283.6	876	248			12	12			12	236	50	186	1,850	38
20	295.0	876	258			13	13			13	245	52	193	2,043	38
Total		17,520	3,652	180	45	183	408	525	252	1,185	2,467	424	2,043	2,043	

Source: JICA Study Team 1.253 823 NPV= 430

Case-H9(0.2MW)

Cash Flow for Small Hydropower -0.2 MW (Case-H9)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter-Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayment Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	NPV (\$000)	FIRR	B/C	
0.2	40%	4%	600	150	5%	70%	525	10	8%	10	25%	214	16.3%	1.27	
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	g) Loan (\$000)		h) Total Cost (f+g) (\$000)	i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i-j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	90			90			90	-90	0	-90	-90	
0			0	90	45		135			156	-156	0	-156	-246	
1	140	701	98			5	5	53	42	99	-1	0	-1	-247	38
2	145.6	701	102			5	5	53	38	95	7	0	7	-241	38
3	151.4	701	106			5	5	53	34	91	15	0	15	-226	38
4	157.5	701	110			6	6	53	29	87	23	0	23	-203	38
5	163.8	701	115			6	6	53	25	83	31	0	31	-172	38
6	170.3	701	119			6	6	53	21	79	40	0	40	-132	38
7	177.1	701	124			6	6	53	17	76	49	0	49	-83	38
8	184.2	701	129			6	6	53	13	72	58	0	58	-26	38
9	191.6	701	134			7	7	53	8	68	67	0	67	41	38
10	199.3	701	140			7	7	53	4	64	76	0	76	117	38
11	207.2	701	145			7	7			7	138	25	113	230	38
12	215.5	701	151			8	8			8	143	26	117	347	38
13	224.1	701	157			8	8			8	149	28	121	468	38
14	233.1	701	163			8	8			8	155	29	126	594	38
15	242.4	701	170			8	8			8	161	31	130	724	38
16	252.1	701	177			9	9			9	168	33	135	860	38
17	262.2	701	184			9	9			9	175	34	140	1,000	38
18	272.7	701	191			10	10			10	182	36	146	1,145	38
19	283.6	701	199			10	10			10	189	38	151	1,296	38
20	295.0	701	207			10	10			10	196	40	157	1,453	38
Total		14,016	2,922	180	45	146	371	525	252	1,148	1,774	320	1,453	1,453	

Source: JICA Study Team 1.002 789 NPV= 214

Case-H10(0.1MW)

Cash Flow for Small Hydropower -0.1 MW (Case-H10)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax					
0.1	50%	4%	300	150	5%	70%	315	10	8%	10	25%	NPV (\$000)	151			
												FIRR	17.4%			
												B/C	1.32			
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000) Power Plant	Inter- Connection Cost	e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000) Principal Repayment		Interest	(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	45			45				45	-45	0	-45	-45	
0			0	45	45		90			13	103	-103	0	-103	-148	
1	140	438	61			3	3	32	25	60	2	0	2	-146	23	
2	145.6	438	64			3	3	32	23	57	6	0	6	-140	23	
3	151.4	438	66			3	3	32	20	55	11	0	11	-128	23	
4	157.5	438	69			3	3	32	18	53	16	0	16	-112	23	
5	163.8	438	72			4	4	32	15	50	22	0	22	-90	23	
6	170.3	438	75			4	4	32	13	48	27	0	27	-64	23	
7	177.1	438	78			4	4	32	10	45	32	0	32	-31	23	
8	184.2	438	81			4	4	32	8	43	38	0	38	6	23	
9	191.6	438	84			4	4	32	5	41	43	0	43	49	23	
10	199.3	438	87			4	4	32	3	38	49	0	49	98	23	
11	207.2	438	91			5	5			5	86	16	70	169	23	
12	215.5	438	94			5	5			5	90	17	73	241	23	
13	224.1	438	98			5	5			5	93	18	76	317	23	
14	233.1	438	102			5	5			5	97	19	78	395	23	
15	242.4	438	106			5	5			5	101	20	81	477	23	
16	252.1	438	110			6	6			6	105	21	84	561	23	
17	262.2	438	115			6	6			6	109	22	87	648	23	
18	272.7	438	119			6	6			6	113	23	91	739	23	
19	283.6	438	124			6	6			6	118	24	94	833	23	
20	295.0	438	129			6	6			6	123	25	98	931	23	
Total		8,760	1,826	90	45	91	226	315	151	692	1,133	203	931	931		

Source: JICA Study Team

626

476

NPV=

151

Case-H11(0.1MW)

Cash Flow for Small Hydropower -0.1 MW (Case-H11)

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax	Subsidy				
0.1	60%	4%	300	150	5%	70%	315	10	8%	10	25%	NPV (\$000)	259			
												FIRR	22.8%			
												B/C	1.53			
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000) Power Plant	Inter- Connection Cost	e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000) Principal Repayment		Interest	(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	45			45				45	-45	0	-45	-45	
0			0	45	45		90			13	103	-103	0	-103	-148	
1	140	526	74			4	4	32	25	60	13	0	13	-134	23	
2	145.6	526	77			4	4	32	23	58	19	0	19	-116	23	
3	151.4	526	80			4	4	32	20	56	24	0	24	-92	23	
4	157.5	526	83			4	4	32	18	53	29	0	29	-62	23	
5	163.8	526	86			4	4	32	15	51	35	0	35	-27	23	
6	170.3	526	90			4	4	32	13	49	41	0	41	14	23	
7	177.1	526	93			5	5	32	10	46	47	0	47	61	23	
8	184.2	526	97			5	5	32	8	44	53	0	53	113	23	
9	191.6	526	101			5	5	32	5	42	59	0	59	173	23	
10	199.3	526	105			5	5	32	3	39	65	0	65	238	23	
11	207.2	526	109			5	5			5	103	20	83	321	23	
12	215.5	526	113			6	6			6	108	21	86	408	23	
13	224.1	526	118			6	6			6	112	22	90	497	23	
14	233.1	526	123			6	6			6	116	23	93	590	23	
15	242.4	526	127			6	6			6	121	25	96	687	23	
16	252.1	526	133			7	7			7	126	26	100	787	23	
17	262.2	526	138			7	7			7	131	27	104	890	23	
18	272.7	526	143			7	7			7	136	28	108	998	23	
19	283.6	526	149			7	7			7	142	30	112	1,110	23	
20	295.0	526	155			8	8			8	147	31	116	1,226	23	
Total		10,512	2,191	90	45	110	245	315	151	711	1,480	254	1,226	1,226		

Source: JICA Study Team

752

493

NPV=

259

Case-W0

Cash Flow for Wind Power-20MW (Case-W0)

1,800															
Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax				
20	25%	4%	36,000		22	70%	25,200	10	8%	5	25%	NPV (\$000)	15,796		
												FIRR	19.6%		
												B/C	1.34		
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	5,400			5,400			5,400	-5,400	0	-5,400	-5,400	
0			0	5,400	0		5,400		1,008	6,408	-6,408	0	-6,408	-11,808	
1	140	43,800	6,132			964	964	2,520	2,016	5,500	632	0	632	-11,176	2,400
2	145.6	43,800	6,377			1,002	1,002	2,520	1,814	5,337	1,041	0	1,041	-10,135	2,400
3	151.4	43,800	6,632			1,042	1,042	2,520	1,613	5,175	1,457	0	1,457	-8,678	2,400
4	157.5	43,800	6,898			1,084	1,084	2,520	1,411	5,015	1,883	0	1,883	-6,795	2,400
5	163.8	43,800	7,174			1,127	1,127	2,520	1,210	4,857	2,317	0	2,317	-4,478	2,400
6	170.3	43,800	7,461			1,172	1,172	2,520	1,008	4,700	2,760	90	2,670	-1,808	2,400
7	177.1	43,800	7,759			1,219	1,219	2,520	806	4,546	3,213	203	3,010	1,202	2,400
8	184.2	43,800	8,069			1,268	1,268	2,520	605	4,393	3,676	319	3,357	4,559	2,400
9	191.6	43,800	8,392			1,319	1,319	2,520	403	4,242	4,150	438	3,713	8,272	2,400
10	199.3	43,800	8,728			1,372	1,372	2,520	202	4,093	4,635	559	4,076	12,348	2,400
11	207.2	43,800	9,077			1,426	1,426			4,266	7,650	1,313	6,338	18,686	2,400
12	215.5	43,800	9,440			1,483	1,483			4,483	7,957	1,389	6,567	25,253	2,400
13	224.1	43,800	9,818			1,543	1,543			4,746	8,275	1,469	6,806	32,059	2,400
14	233.1	43,800	10,210			1,604	1,604			5,050	8,606	1,551	7,054	39,113	2,400
15	242.4	43,800	10,619			1,669	1,669			5,369	8,950	1,637	7,312	46,426	2,400
16	252.1	43,800	11,043			1,735	1,735			5,694	9,308	1,725	7,587	53,813	
17	262.2	43,800	11,485			1,805	1,805			6,039	9,680	1,815	7,872	61,685	
18	272.7	43,800	11,945			1,877	1,877			6,396	10,068	1,908	8,164	69,849	
19	283.6	43,800	12,422			1,952	1,952			6,778	10,470	2,005	8,469	78,318	
20	295.0	43,800	12,919			2,030	2,030			7,186	10,889	2,107	8,782	87,100	
Total		876,000	182,599	10,800	0	28,694	39,494	25,200	12,096	76,790	105,809	21,572	84,237	84,237	

Source: JICA Study Team

Case-W1

Cash Flow for Wind Power-20MW (Case-W1)

1,700															
Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax				
20	25%	4%	34,000		22	70%	23,800	10	8%	5	25%	NPV (\$000)	17,384		
												FIRR	21.2%		
												B/C	1.38		
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	5,100			5,100			5,100	-5,100	0	-5,100	-5,100	
0			0	5,100	0		5,100		952	6,052	-6,052	0	-6,052	-11,152	
1	140	43,800	6,132			964	964	2,380	1,904	5,248	884	0	884	-10,268	2,267
2	145.6	43,800	6,377			1,002	1,002	2,380	1,714	5,096	1,282	0	1,282	-8,986	2,267
3	151.4	43,800	6,632			1,042	1,042	2,380	1,523	4,945	1,687	0	1,687	-7,299	2,267
4	157.5	43,800	6,898			1,084	1,084	2,380	1,333	4,797	2,101	0	2,101	-5,198	2,267
5	163.8	43,800	7,174			1,127	1,127	2,380	1,142	4,650	2,524	0	2,524	-2,674	2,267
6	170.3	43,800	7,461			1,172	1,172	2,380	952	4,504	2,956	172	2,784	109	2,267
7	177.1	43,800	7,759			1,219	1,219	2,380	762	4,361	3,398	283	3,115	3,225	2,267
8	184.2	43,800	8,069			1,268	1,268	2,380	571	4,219	3,850	396	3,454	6,679	2,267
9	191.6	43,800	8,392			1,319	1,319	2,380	381	4,080	4,313	511	3,801	10,480	2,267
10	199.3	43,800	8,728			1,372	1,372	2,380	190	3,942	4,786	630	4,156	14,636	2,267
11	207.2	43,800	9,077			1,426	1,426			4,266	7,650	1,346	6,305	20,941	2,267
12	215.5	43,800	9,440			1,483	1,483			4,483	7,957	1,422	6,534	27,475	2,267
13	224.1	43,800	9,818			1,543	1,543			4,746	8,275	1,502	6,773	34,247	2,267
14	233.1	43,800	10,210			1,604	1,604			5,050	8,606	1,585	7,021	41,268	2,267
15	242.4	43,800	10,619			1,669	1,669			5,369	8,950	1,671	7,279	48,548	2,267
16	252.1	43,800	11,043			1,735	1,735			5,694	9,308	1,760	7,548	55,996	
17	262.2	43,800	11,485			1,805	1,805			6,039	9,680	1,850	7,839	63,835	
18	272.7	43,800	11,945			1,877	1,877			6,396	10,068	1,945	8,123	72,058	
19	283.6	43,800	12,422			1,952	1,952			6,778	10,470	2,045	8,428	80,486	
20	295.0	43,800	12,919			2,030	2,030			7,186	10,889	2,150	8,739	89,225	
Total		876,000	182,599	10,200	0	28,694	38,894	23,800	11,424	74,118	108,481	22,122	86,359	86,359	

Source: JICA Study Team

Case-W2

Cash Flow for Wind Power-20MW (Case-W2)

1,700															
Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax				
20	34%	4%	34,000		22	70%	23,800	10	8%	5	25%				
											NPV (\$000)	33,365			
											FIRR	31.9%			
											B/C	1.64			
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	5,100			5,100			5,100	-5,100	0	-5,100	-5,100	
0			0	5,100	0		5,100		952	6,052	-6,052	0	-6,052	-11,152	
1	140	59,568	8,340			1,310	1,310	2,380	1,904	5,594	2,745	0	2,745	-8,407	2,267
2	145.6	59,568	8,673			1,363	1,363	2,380	1,714	5,457	3,217	0	3,217	-5,190	2,267
3	151.4	59,568	9,020			1,417	1,417	2,380	1,523	5,321	3,699	0	3,699	-1,491	2,267
4	157.5	59,568	9,381			1,474	1,474	2,380	1,333	5,187	4,194	0	4,194	2,703	2,267
5	163.8	59,568	9,756			1,533	1,533	2,380	1,142	5,055	4,701	0	4,701	7,403	2,267
6	170.3	59,568	10,146			1,594	1,594	2,380	952	4,926	5,220	738	4,482	11,885	2,267
7	177.1	59,568	10,552			1,658	1,658	2,380	762	4,800	5,752	871	4,881	16,766	2,267
8	184.2	59,568	10,974			1,725	1,725	2,380	571	4,676	6,299	1,008	5,291	22,057	2,267
9	191.6	59,568	11,413			1,794	1,794	2,380	381	4,554	6,859	1,148	5,711	27,767	2,267
10	199.3	59,568	11,870			1,865	1,865	2,380	190	4,436	7,434	1,292	6,142	33,910	2,267
11	207.2	59,568	12,345			1,940	1,940			4,318	8,022	1,446	6,576	40,486	2,267
12	215.5	59,568	12,838			2,017	2,017			4,205	8,627	1,605	7,022	47,508	2,267
13	224.1	59,568	13,352			2,098	2,098			4,096	9,243	1,768	7,555	55,063	2,267
14	233.1	59,568	13,886			2,182	2,182			4,000	9,875	1,935	8,110	63,173	2,267
15	242.4	59,568	14,441			2,269	2,269			3,908	10,523	2,106	8,697	71,870	2,267
16	252.1	59,568	15,019			2,360	2,360			3,820	11,197	2,281	9,316	81,156	2,267
17	262.2	59,568	15,620			2,455	2,455			3,736	11,907	2,460	9,977	91,133	2,267
18	272.7	59,568	16,245			2,553	2,553			3,656	12,653	2,644	10,689	101,822	2,267
19	283.6	59,568	16,894			2,655	2,655			3,580	13,437	2,832	11,445	113,367	2,267
20	295.0	59,568	17,570			2,761	2,761			3,508	14,261	3,024	12,237	126,604	2,267
Total		1,191,360	248,335	10,200	0	39,024	49,224	23,800	11,424	84,448	163,887	33,454	130,433	130,433	

Source: JICA Study Team

85.203

51.837

NPV=

33,365

Case-W3

Cash Flow for Wind Power-20MW (Case-W3)

1,600															
Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax				
20	34%	4%	32,000		22	70%	22,400	10	8%	5	25%				
											NPV (\$000)	34,954			
											FIRR	34.5%			
											B/C	1.70			
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
0			0	4,800			4,800			4,800	-4,800	0	-4,800	-4,800	
0			0	4,800	0		4,800		896	5,696	-5,696	0	-5,696	-10,496	
1	140	59,568	8,340			1,310	1,310	2,240	1,792	5,342	2,997	0	2,997	-7,499	2,133
2	145.6	59,568	8,673			1,363	1,363	2,240	1,613	5,216	3,457	0	3,457	-4,042	2,133
3	151.4	59,568	9,020			1,417	1,417	2,240	1,434	5,091	3,929	0	3,929	-113	2,133
4	157.5	59,568	9,381			1,474	1,474	2,240	1,254	4,969	4,412	0	4,412	4,300	2,133
5	163.8	59,568	9,756			1,533	1,533	2,240	1,075	4,848	4,908	0	4,908	9,207	2,133
6	170.3	59,568	10,146			1,594	1,594	2,240	896	4,730	5,416	821	4,595	13,803	2,133
7	177.1	59,568	10,552			1,658	1,658	2,240	717	4,615	5,937	951	4,986	18,789	2,133
8	184.2	59,568	10,974			1,725	1,725	2,240	538	4,502	6,472	1,085	5,387	24,176	2,133
9	191.6	59,568	11,413			1,794	1,794	2,240	358	4,392	7,021	1,222	5,799	29,976	2,133
10	199.3	59,568	11,870			1,865	1,865	2,240	179	4,284	7,585	1,363	6,222	36,198	2,133
11	207.2	59,568	12,345			1,940	1,940			4,180	8,167	1,506	6,661	42,859	2,133
12	215.5	59,568	12,838			2,017	2,017			4,080	8,773	1,652	7,021	49,880	2,133
13	224.1	59,568	13,352			2,098	2,098			4,000	9,403	1,802	7,311	57,191	2,133
14	233.1	59,568	13,886			2,182	2,182			3,920	10,053	1,956	7,555	65,146	2,133
15	242.4	59,568	14,441			2,269	2,269			3,840	10,723	2,114	7,761	73,607	2,133
16	252.1	59,568	15,019			2,360	2,360			3,760	11,413	2,276	7,927	82,534	2,133
17	262.2	59,568	15,620			2,455	2,455			3,680	12,123	2,448	8,079	91,953	2,133
18	272.7	59,568	16,245			2,553	2,553			3,600	12,853	2,624	8,205	101,958	2,133
19	283.6	59,568	16,894			2,655	2,655			3,520	13,603	2,804	8,299	112,557	2,133
20	295.0	59,568	17,570			2,761	2,761			3,440	14,373	2,988	8,311	123,868	2,133
Total		1,191,360	248,335	9,600	0	39,024	48,624	22,400	10,752	81,776	166,559	34,005	132,554	132,554	

Source: JICA Study Team

85.203

50,249

NPV=

34,954

Case-S0

Cash Flow for PV Power-20MW (Case-S0)

														3,800													
														Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax		
														20	18%	4%	76,000		4	70%	53,200	10	8%	5	25%	NPV (\$000)	-26,811
																										FIRR	1.7%
																										B/C	0.63
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)												
0			0	11,400			11,400		11,400	-11,400	0	-11,400	-11,400														
0			0	11,400	0		11,400		13,528	-13,528	0	-13,528	-24,928														
1	140	31,536	4,415			126	126	5,320	4,256	9,702	-5,287	0	-5,287	-30,215	5,067												
2	145.6	31,536	4,592			131	131	5,320	3,830	9,282	-4,690	0	-4,690	-34,905	5,067												
3	151.4	31,536	4,775			136	136	5,320	3,405	8,861	-4,086	0	-4,086	-38,991	5,067												
4	157.5	31,536	4,966			142	142	5,320	2,979	8,441	-3,475	0	-3,475	-42,466	5,067												
5	163.8	31,536	5,165			148	148	5,320	2,554	8,021	-2,856	0	-2,856	-45,322	5,067												
6	170.3	31,536	5,372			153	153	5,320	2,128	7,601	-2,230	0	-2,230	-47,552	5,067												
7	177.1	31,536	5,586			160	160	5,320	1,702	7,182	-1,596	0	-1,596	-49,147	5,067												
8	184.2	31,536	5,810			166	166	5,320	1,277	6,763	-953	0	-953	-50,100	5,067												
9	191.6	31,536	6,042			173	173	5,320	851	6,344	-302	0	-302	-50,402	5,067												
10	199.3	31,536	6,284			180	180	5,320	426	5,925	359	0	359	-50,043	5,067												
11	207.2	31,536	6,535			187	187			187	6,349	320	6,028	-44,015	5,067												
12	215.5	31,536	6,797			194	194			194	6,603	384	6,219	-37,796	5,067												
13	224.1	31,536	7,069			202	202			202	6,867	450	6,417	-31,380	5,067												
14	233.1	31,536	7,351			210	210			210	7,141	519	6,623	-24,757	5,067												
15	242.4	31,536	7,645			218	218			218	7,427	590	6,837	-17,920	5,067												
16	252.1	31,536	7,951			227	227			227	7,724	1,931	5,793	-12,127													
17	262.2	31,536	8,269			236	236			236	8,033	2,008	6,025	-6,102													
18	272.7	31,536	8,600			246	246			246	8,354	2,089	6,266	163													
19	283.6	31,536	8,944			256	256			256	8,689	2,172	6,516	6,680													
20	295.0	31,536	9,302			266	266			266	9,036	2,259	6,777	13,457													
Total		630,720	131,471	22,800	0	3,756	26,556	53,200	25,536	105,292	26,179	12,722	13,457	13,457													

Source: JICA Study Team

Case-S1

Cash Flow for PV Power-20MW (Case-S1)

														2,700													
														Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter- Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayme nt Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax		
														20	18%	4%	54,000		4	70%	37,800	10	8%	5	25%	NPV (\$000)	-7,518
																										FIRR	6.9%
																										B/C	0.86
Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i- j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)												
0			0	8,100			8,100		8,100	-8,100	0	-8,100	-8,100														
0			0	8,100	0		8,100		9,612	-9,612	0	-9,612	-17,712														
1	140	31,536	4,415			126	126	3,780	3,024	6,930	-2,515	0	-2,515	-20,227	3,600												
2	145.6	31,536	4,592			131	131	3,780	2,722	6,633	-2,041	0	-2,041	-22,268	3,600												
3	151.4	31,536	4,775			136	136	3,780	2,419	6,336	-1,560	0	-1,560	-23,829	3,600												
4	157.5	31,536	4,966			142	142	3,780	2,117	6,039	-1,072	0	-1,072	-24,901	3,600												
5	163.8	31,536	5,165			148	148	3,780	1,814	5,742	-577	0	-577	-25,478	3,600												
6	170.3	31,536	5,372			153	153	3,780	1,512	5,445	-74	0	-74	-25,552	3,600												
7	177.1	31,536	5,586			160	160	3,780	1,210	5,149	437	0	437	-25,115	3,600												
8	184.2	31,536	5,810			166	166	3,780	907	4,853	957	0	957	-24,158	3,600												
9	191.6	31,536	6,042			173	173	3,780	605	4,557	1,485	0	1,485	-22,673	3,600												
10	199.3	31,536	6,284			180	180	3,780	302	4,262	2,022	0	2,022	-20,651	3,600												
11	207.2	31,536	6,535			187	187			187	6,349	687	5,661	-14,990	3,600												
12	215.5	31,536	6,797			194	194			194	6,603	751	5,852	-9,138	3,600												
13	224.1	31,536	7,069			202	202			202	6,867	817	6,050	-3,088	3,600												
14	233.1	31,536	7,351			210	210			210	7,141	885	6,256	3,168	3,600												
15	242.4	31,536	7,645			218	218			218	7,427	957	6,470	9,639	3,600												
16	252.1	31,536	7,951			227	227			227	7,724	1,931	5,793	15,432													
17	262.2	31,536	8,269			236	236			236	8,033	2,008	6,025	21,456													
18	272.7	31,536	8,600			246	246			246	8,354	2,089	6,266	27,722													
19	283.6	31,536	8,944			256	256			256	8,689	2,172	6,516	34,239													
20	295.0	31,536	9,302			266	266			266	9,036	2,259	6,777	41,016													
Total		630,720	131,471	16,200	0	3,756	19,956	37,800	18,144	75,900	55,571	14,556	41,016	41,016													

Source: JICA Study Team

Case-S2

Cash Flow for PV Power-20MW (Case-S2)

2,700

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter-Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayment Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax
20	25%	4%	54,000		4	70%	37,800	10	8%	5	25%

NPV (\$000)	7,889
FIRR	13.2%
B/C	1.14

Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i-j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
				Power Plant	Inter-Connection Cost			Principal Repayment	Interest						
0			0	8,100			8,100			8,100	-8,100	0	-8,100	-8,100	
0			0	8,100		0	8,100		1,512	9,612	-9,612	0	-9,612	-17,712	
1	140	43,800	6,132			175	175	3,780	3,024	6,979	-847	0	-847	-18,559	3,600
2	145.6	43,800	6,377			182	182	3,780	2,722	6,684	-307	0	-307	-18,866	3,600
3	151.4	43,800	6,632			189	189	3,780	2,419	6,389	244	0	244	-18,622	3,600
4	157.5	43,800	6,898			197	197	3,780	2,117	6,094	804	0	804	-17,818	3,600
5	163.8	43,800	7,174			205	205	3,780	1,814	5,799	1,374	0	1,374	-16,444	3,600
6	170.3	43,800	7,461			213	213	3,780	1,512	5,505	1,955	0	1,955	-14,489	3,600
7	177.1	43,800	7,759			222	222	3,780	1,210	5,211	2,548	0	2,548	-11,941	3,600
8	184.2	43,800	8,069			231	231	3,780	907	4,918	3,152	0	3,152	-8,789	3,600
9	191.6	43,800	8,392			240	240	3,780	605	4,625	3,767	42	3,726	-5,064	3,600
10	199.3	43,800	8,728			249	249	3,780	302	4,332	4,396	199	4,197	-867	3,600
11	207.2	43,800	9,077			259	259			259	8,818	1,304	7,513	6,646	3,600
12	215.5	43,800	9,440			270	270			270	9,170	1,393	7,778	14,424	3,600
13	224.1	43,800	9,818			281	281			281	9,537	1,484	8,053	22,477	3,600
14	233.1	43,800	10,210			292	292			292	9,919	1,580	8,339	30,816	3,600
15	242.4	43,800	10,619			303	303			303	10,315	1,679	8,636	39,452	3,600
16	252.1	43,800	11,043			316	316			316	10,728	2,682	8,046	47,498	
17	262.2	43,800	11,485			328	328			328	11,157	2,789	8,368	55,866	
18	272.7	43,800	11,945			341	341			341	11,603	2,901	8,702	64,568	
19	283.6	43,800	12,422			355	355			355	12,067	3,017	9,051	73,619	
20	295.0	43,800	12,919			369	369			369	12,550	3,138	9,413	83,031	
Total		876,000	182,599	16,200	0	5,217	21,417	37,800	18,144	77,361	105,238	22,207	83,031	83,031	

Source: JICA Study Team

62,649

54,760

NPV=

7,889

Case-S3

Cash Flow for PV Power-20MW (Case-S3)

1,600

Plant Cap (MW)	Capacity Factor (%)	Escalation Rate	Plant Cost (\$000)	Inter-Connection Cost (\$000)	O/M Cost (\$/MWh)	% of Loan	Bank Loan (\$000)	Repayment Period (year)	Loan Interest Rate p.a	Tax Exemption (year)	Corporate Tax
20	25%	4%	32,000		4	70%	22,400	10	8%	5	25%

NPV (\$000)	25,745
FIRR	27.8%
B/C	1.70

Year	(a) Unit Price (\$/MWh)	(b) Generation (MWh)	(c) Operation Income (\$000)	d) Capital Cost (\$000)		e) O/M Cost (\$000)	f) Sub Total Cost (d+e)	(g) Loan (\$000)		(h) Total Cost (f+g) (\$000)	(i) Profit before Tax (c-h) (\$000)	(j) Corporate Tax (25%)	(k) Net Income (i-j) (\$000)	(l) Accumulated Income (\$000)	Depreciation (\$000)
				Power Plant	Inter-Connection Cost			Principal Repayment	Interest						
0			0	4,800			4,800			4,800	-4,800	0	-4,800	-4,800	
0			0	4,800		0	4,800		896	5,696	-5,696	0	-5,696	-10,496	
1	140	43,800	6,132			175	175	2,240	1,792	4,207	1,925	0	1,925	-8,571	2,133
2	145.6	43,800	6,377			182	182	2,240	1,613	4,035	2,342	0	2,342	-6,229	2,133
3	151.4	43,800	6,632			189	189	2,240	1,434	3,863	2,769	0	2,769	-3,460	2,133
4	157.5	43,800	6,898			197	197	2,240	1,254	3,691	3,206	0	3,206	-253	2,133
5	163.8	43,800	7,174			205	205	2,240	1,075	3,520	3,653	0	3,653	3,400	2,133
6	170.3	43,800	7,461			213	213	2,240	896	3,349	4,111	495	3,617	7,017	2,133
7	177.1	43,800	7,759			222	222	2,240	717	3,178	4,580	612	3,969	10,985	2,133
8	184.2	43,800	8,069			231	231	2,240	538	3,008	5,061	732	4,329	15,315	2,133
9	191.6	43,800	8,392			240	240	2,240	358	2,838	5,554	855	4,699	20,013	2,133
10	199.3	43,800	8,728			249	249	2,240	179	2,669	6,059	981	5,078	25,091	2,133
11	207.2	43,800	9,077			259	259			259	8,818	1,671	7,146	32,238	2,133
12	215.5	43,800	9,440			270	270			270	9,170	1,759	7,411	39,649	2,133
13	224.1	43,800	9,818			281	281			281	9,537	1,851	7,686	47,335	2,133
14	233.1	43,800	10,210			292	292			292	9,919	1,946	7,972	55,307	2,133
15	242.4	43,800	10,619			303	303			303	10,315	2,045	8,270	63,577	2,133
16	252.1	43,800	11,043			316	316			316	10,728	2,682	8,046	71,623	
17	262.2	43,800	11,485			328	328			328	11,157	2,789	8,368	79,990	
18	272.7	43,800	11,945			341	341			341	11,603	2,901	8,702	88,693	
19	283.6	43,800	12,422			355	355			355	12,067	3,017	9,051	97,743	
20	295.0	43,800	12,919			369	369			369	12,550	3,138	9,413	107,156	
Total		876,000	182,599	9,600	0	5,217	14,817	22,400	10,752	47,969	134,630	27,474	107,156	107,156	

Source: JICA Study Team

62,649

36,904

NPV=

25,745