第６章　送配電設備

App. 6-4-1 PRICE LIST

No.	Article	Description	Unit	Unit Price (SB$)
1	ACSR 42mm^2"APPLE"		m	1.64
2	ACSR 66mm^2"BANANA"		m	3.43
3	ACSR 10mm^2"CHERRY"		m	5.90
4	AAC 77mm2"MARS"		m	2.45
5	AAC 124mm^2"MOON"		m	5.28
6	ACSR/AC"QUINCE"		m	1.93
7	XLPE 4x25mm^2 cable		m	10.50
8	XLPE 4x50mm^2 cable	0.7kg/m	m	16.02
9	XLPE 4x95mm^2 cable	1.35kg/m	m	29.98
10	Dead-end hard. for BANANA		p.c.	44.98
11	Dead-end hard. for APPLE		p.c.	60.00
12	Dead-end hard. for CHERRY		p.c.	103.35
13	11kV Insulator 254mm		p.c.	29.00
14	11kV Insulator 16mm Ball		p.c.	36.20
15	11kV Pin Insulator "A"		p.c.	16.34
16	LV Pin Insulator "B"		p.c.	4.60
17	Steel Pole 3.6m Sec. 2	for 11kV line	p.c.	281.13
18	Steel Pole 3.6m Sec. 3	for 11kV line	p.c.	228.89
19	Steel Pole 3.6m Sec. 4	for 11kV line	p.c.	267.85
20	Steel Pole 3.6m Sec. 5	for 11kV line	p.c.	363.52
21	Steel Pole	ϕ100 x 9 for LV line	p.c.	1,295.27
22	Crossarm 101 x 50mm x 10kg/m		p.c.	109.07
23	Steel crossarm bracket	No. 2 sect	p.c.	207.60
24	Steel crossarm bracket	3.6m	p.c.	203.75
25	Steel crossarm bracket	3.6m	p.c.	255.36
26	Tr 1000kVA	S/N 36964	each	31,504.10
27	Tr 750kVA	S/N 37137	each	24,245.80
28	Tr 500kVA	S/N 43641	each	30,949.40
29	Tr 1000kVA	S/N 36970	each	42,688.60
30	Tr 300kVA	ABB	each	35,156.60
31	Tr 200kVA	ABB	each	20,413.00
32	Tr 300kVA 11kV/415V	3P S/N 50232	each	20,080.00
33	Tr 300kVA 11kV/415V	with D/S S/N 15368	each	34,667.40
34	Tr 300kVA 11kV/415V		each	47,100.00
35	Tr 500kVA		each	79,063.09
36	Tr 200kVA 11kV/415V 3P		each	28,592.80
37	Tr 500kVA 33/11kV	Outdoor, Ground mopunting	each	830,610.60
38	Tr 50kVA 11kV/415V Dy11	BBC 3P Pole mounting	each	10,252.34
39	Tr 100kVA 11kV/415V Dy11	BBC 3P Pole mounting	each	18,439.32
40	Tr 200kVA 11kV/415V Dy11	BBC 3P Pole mounting	each	27,286.00

App. 6-4-1 PRICE LIST

No.	Article	Description	Unit	Unit Price (SB$)
41	Tr 300kVA 11kV/415V Dy11	BBC 3P Ground mounting	each	34,692.59
42	Tr 500kVA 11kV/415V Dy11	BBC 3P Pad mounting	each	83,482.98
43	Ring main unit SDAF3		p.c.	32,557.53
44	Switch SDAF		p.c.	12,516.00
45	Tr 500kVA w/main ring unit	S/N 5286	p.c.	47,269.03
46	Double oil switch SD2		p.c.	10,749.08
47	Tr 500kVA w/main ring unit	S/N 51514	p.c.	42,473.80
48	Tr 10kVA		p.c.	2,870.30
49	Tr 15kVA 11kV 3P	S/N 309224-309227	p.c.	4,442.00
50	Auto ring main unit SDAF3	3P cable 185mm2 ABB	p.c.	19,516.50
51	Triple oil switch SD3	3P cable 185mm2 ABB	p.c.	22,994.00
52	Tr 50VA 11kV/415V	Outdoor, Pole mopunting	p.c.	12,958.55
53	Lightning arrester	12kV 10kA XBE 242	p.c.	542.96
54	Lightning arrester	30kV XBE 30A3	p.c.	814.67
55	Air break SW 11kV 600A	3 insulator/P D169H/1C	p.c.	5,844.60
56	Air break SW 11kV 600A	2 insulator/P D459H/1C	p.c.	6,427.00
57	LV 400A fuse SW		p.c.	372.58
58	D/D fuse SW 3P 11kV	D246/11	p.c.	950.00
59	D/D fuse SW 1P 11kV 100A	S/N 7242181	p.c.	282.40
60	Street column		set	1,770.20
61	33kV XLPE Al Cable	25mm2	m	90.63
62	33kV XLPE Al Cable	240mm2	m	192.28
63	33kV XLPE Cu Cable	150mm2	m	229.09
64	Joint kits	for 25mm2 Al XLPE	each	4,062.50
65	Joint kits	for 240mm2 Al XLPE	each	4,822.00
66	Joint kits	for 150mm2 Al XLPE	each	4,772.00
67	Termination kits	for 25mm2 Al XLPE	each	2,281.25
68	Termination kits	for 240mm2 Al XLPE	each	2,572.00
69	Termination kits	for 150mm2 Al XLPE	each	2,315.00
70	Cover tile	for underground cable	km	18,750.00
71	Warning tape		km	1,093.75

Appendix 6-6-1 Monthly Maximum Mean Temperature

SOLOMON ISLANDS METEOROLOGICAL SERVICE
CLIMATOLOGICAL DATA

STATION : HONIARA ISLAND: GUADALCANAL YEAR : 1951 - 1997

LATITUDE: 09 25 'S LONGITUDE: 160 03 'E ELEVATION : 7.9 M

YEARS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1951	31.5	30.5	29.8	30.4	30.6	31.1	30.2	30.4	30.4	31.0	31.2	31.3
1952	30.7	30.9	30.5	29.8	30.9	30.2	29.8	30.6	30.2			
1953	31.1	30.6	29.8	29.6	29.6	30.2	29.3	29.1	30.0	30.5	30.7	30.7
1954	30.5	30.0	30.5	30.9	30.8	30.9	30.6	30.8	31.4	30.9	30.6	30.4
1955	31.1	30.9	29.7	31.0	31.2	30.7	30.2	30.9	30.8	31.2	30.5	29.5
1956	30.8	30.0	29.9	31.0	31.6	31.0	30.9	31.3	31.8	31.5	31.0	30.6
1957	30.5	29.8	29.7	30.5	30.0	30.0	30.2	30.6	30.1	30.3	30.8	30.8
1958	31.2	31.1	31.1	30.1	30.5	29.9	30.2	31.0	31.1	31.1	30.9	29.9
1959	30.4	30.4	30.2	30.4	30.4	30.0	30.1	29.9	29.7	30.5	30.8	30.5
1960	30.8	30.0	29.9	30.1	31.1	30.5	30.0	30.8	30.9	30.6	31.5	31.1
1961	30.7	31.1	30.6	31.1	31.1	30.9	29.7	30.6	30.4	30.6	30.6	31.2
1962	31.1	30.4	30.9	30.3	30.4	30.1	30.6	30.5	30.9	31.5	30.5	30.1
1963	30.9	30.7	30.2	30.5	30.8	30.9	29.8	30.3	30.2	29.6	30.1	30.4
1964	30.6	30.8	30.7	30.7	30.8	30.3	30.5	30.6	31.4	31.1	30.7	30.5
1965	30.3	30.6	29.7	30.3	30.0	29.1	28.4	29.1	30.1	30.4	30.2	30.5
1966	31.1	31.0	30.4	30.8	30.5	30.7	30.6	31.0	30.9	31.1	30.5	30.4
1967	29.9	29.8	29.9	30.3	30.6	30.8	30.4	30.1	30.6	29.9	30.1	31.1
1968	30.6	30.1	30.6	30.3	31.1	30.7	29.7	30.2	30.4	30.6	30.7	30.3
1969	30.8	30.5	30.8	31.1	31.4	30.7	30.2	30.1	30.8	31.1	31.2	30.3
1970	31.3	30.5	30.6	30.2	30.6	30.2	30.2	30.8	30.6	30.2	30.6	30.5
1971	30.2	30.6	29.3	30.3	30.6	30.4	30.2	30.7	30.7	30.7	30.9	30.3
1972	29.6	30.9	30.1	30.3	30.1	29.6	29.7	29.4	30.0	30.4	31.4	30.6
1973	31.4	30.4	30.5	30.6	30.3	30.8	30.1	30.6	30.9	30.4	30.6	30.3
1974	30.1	29.8	30.1	30.6	30.7	30.6	30.9	30.9	30.8			
1987			31.2	31.0	30.8	31.4	30.7	30.9	31.4	31.3	31.6	31.0
1988	30.7	30.8	32.0	31.2	31.9	31.0	30.6	30.8	30.8	30.8	30.6	29.8
1989	30.4	29.7	30.5	30.5	30.4	31.0	31.3	31.8	31.6	32.1	32.9	31.2
1990	31.5	31.8	31.3	31.4	31.6	31.2	30.8	31.6	31.2	32.3	31.9	31.4
1991	31.4	31.1	31.5	31.9	31.3	31.1	30.4	30.6	30.3	30.9	31.1	32.3
1992	31.7	30.5	31.1	31.1	31.0	30.8	30.2	30.9	31.0	30.9	30.6	31.4
1993	31.6	31.1	31.4	31.3	30.5	30.5	29.9	29.7	30.1	30.7	31.9	31.6
1994	31.4	31.0	31.4	31.3	30.9	30.3	30.0	30.4	30.7	31.3	31.9	31.5
1995	32.0	31.5	30.4	31.6	31.4	31.7	32.2	32.0	31.9	31.6	32.6	31.4
1996	31.1	31.7	31.2	31.9	31.2	31.1	31.4	31.5	31.7	31.6	31.7	31.2
1997	31.4	30.8	30.7	31.0	31.3	30.7	32.1	30.5	30.1	29.9	31.4	32.1
Aver	30.8	30.6	30.5	30.7	30.8	30.6	30.3	30.6	30.7	30.9	31.0	30.8
Lowest	29.6	29.7	29.3	29.6	29.6	29.1	28.4	29.1	29.7	29.6	30.1	29.5
Highest	32.0	31.8	32.0	31.9	31.9	31.7	32.2	32.0	31.9	32.3	32.9	32.3
Entries	34	34	35	35	35	35	35	35	35	33	33	33

SOLOMON ISLANDS METEOROLOGICAL SERVICE
CLIMATOLOGICAL DATA

STATION : HONIARA ISLAND: GUADALCANAL YEAR : 1951 - 1997

LATITUDE: 09 25 'S LONGITUDE: 160 03 'E ELEVATION : 7.9 M

YEARS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1951	27.1	26.6	26.2	26.6	26.4	26.6	25.9	26.2	26.4	26.7	27.1	27.1
1952	27.2	27.3	26.9	26.4	26.9	26.5	26.1	26.5	26.4			
1953	27.1	26.7	26.3	26.0	25.8	26.3	25.7	25.7	26.1	26.5	26.8	26.7
1954	26.8	26.4	26.7	26.8	26.8	26.5	26.4	26.3	26.7	26.6	26.5	26.7
1955	27.0	26.9	26.2	26.7	26.7	26.4	26.2	26.3	26.1	26.7	26.4	25.9
1956	26.4	26.4	26.1	26.6	27.1	26.7	26.6	26.8	27.1	27.2	26.9	27.0
1957	26.8	26.3	26.3	26.8	26.5	26.0	26.1	26.5	26.5	26.6	26.7	27.0
1958	27.1	27.3	27.2	26.9	26.8	26.2	26.1	26.5	27.0	27.0	26.8	26.5
1959	26.9	26.7	26.8	26.8	26.8	26.5	26.2	25.9	25.8	26.6	26.8	26.9
1960	26.8	26.4	26.3	26.5	27.1	26.6	26.0	26.4	26.7	26.5	27.3	27.1
1961	27.2	27.2	26.9	27.0	27.0	26.7	26.0	26.4	26.4	26.4	26.5	27.0
1962	27.2	26.8	26.9	26.6	26.6	26.1	26.5	26.3	26.7	27.0	26.6	26.6
1963	26.9	26.7	26.6	26.7	26.7	26.8	26.1	26.5	26.3	26.1	26.2	26.6
1964	26.9	27.1	27.0	26.9	26.8	26.3	26.2	26.3	26.9	26.8	26.6	26.5
1965	26.6	26.7	26.3	26.4	26.2	25.6	25.2	25.3	26.2	26.2	26.2	26.8
1966	26.8	27.1	26.7	26.7	26.6	26.5	26.3	26.6	26.6	26.9	26.5	26.6
1967	26.5	26.4	26.4	26.5	26.7	26.7	26.2	26.2	26.5	26.2	26.2	27.0
1968	26.8	26.5	26.7	26.3	26.8	26.6	26.0	26.1	26.3	26.6	26.8	26.8
1969	26.8	26.9	27.1	27.4	27.4	26.8	26.3	26.2	26.7	27.0	27.2	26.8
1970	27.4	26.9	27.2	26.6	26.9	26.5	26.4	26.6	26.5	26.5	26.7	26.8
1971	26.6	26.7	26.0	26.5	26.6	26.3	26.0	26.3	26.6	26.5	26.8	26.5
1972	26.2	26.9	26.5	26.6	26.7	26.1	25.8	25.3	26.0	26.4	27.3	27.2
1973	27.5	27.0	27.2	27.0	26.6	27.0	26.2	26.5	26.9	26.6	26.9	26.8
1974	26.4	26.2	26.5	26.7	26.6	26.7	26.7	26.6	26.6			
1987			27.5	27.2	27.1	26.9	26.6	26.3	27.3	27.5	27.8	27.5
1988	27.4	27.5	28.1	27.4	27.9	27.2	26.8	26.9	27.0	27.0	27.0	26.6
1989	27.0	26.5	26.9	27.0	26.8	26.9	27.1	27.3	27.4	27.8	28.5	27.7
1990	27.9	27.7	27.8	27.6	27.8	27.3	27.0	27.3	27.2	28.0	27.9	27.7
1991	27.9	27.6	27.6	27.9	27.6	27.5	26.8	27.0	26.7	27.1	27.0	27.9
1992	27.7	27.1	27.3	27.2	27.3	27.2	26.7	27.0	26.9	27.0	26.9	27.6
1993	27.5	27.4	27.4	27.6	27.1	27.0	26.3	25.8	26.3	26.7	27.6	27.8
1994	27.7	27.4	27.6	27.5	27.3	26.6	26.4	26.8	26.6	27.1	27.4	27.5
1995	28.2	27.9	27.2	27.8	27.6	27.5	27.6	27.7	27.5	27.6	28.2	27.6
1996	27.5	27.8	27.5	27.8	27.4	27.2	27.4	27.3	27.6	27.5	27.5	27.6
1997	27.6	27.4	27.3	27.3	27.2	26.5	27.6	26.4	26.1	25.8	27.1	28.1
Aver	27.1	27.0	26.9	26.9	26.9	26.6	26.4	26.5	26.6	26.8	27.0	27.0
Lowest	26.2	26.2	26.0	26.0	25.8	25.6	25.2	25.3	25.8	25.8	26.2	25.9
Highest	28.2	27.9	28.1	27.9	27.9	27.5	27.6	27.7	27.6	28.0	28.5	28.1
Entries	34	34	35	35	35	35	35	35	35	33	33	33

Appendix 6-6-3 Monthly Minimum Mean Temperature

SOLOMON ISLANDS METEOROLOGICAL SERVICE
CLIMATOLOGICAL DATA

STATION : HONIARA Vavaya Ridge ISLAND: GUADALCANAL YEAR : 1951 - 1997

LATITUDE: 09 25 'S LONGITUDE: 160 03 'E ELEVATION : 7.9 M

YEARS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1951	22.6	22.7	22.7	22.8	22.3	22.1	21.6	22.0	22.4	22.4	22.9	22.9
1952	23.6	23.6	23.3	23.0	22.9	22.8	22.4	22.3	22.5			
1953	23.1	22.9	22.9	22.5	22.1	22.4	22.1	22.2	22.2	22.5	22.8	22.6
1954	23.1	22.8	22.9	22.7	22.8	22.0	22.2	21.8	22.1	22.4	22.5	22.9
1955	22.9	22.9	22.7	22.4	22.2	22.1	22.1	21.6	21.4	22.1	22.3	22.4
1956	22.0	22.7	22.3	22.2	22.6	22.4	22.2	22.4	22.5	22.9	22.9	23.3
1957	23.1	22.8	22.9	23.1	22.9	22.0	22.1	22.4	22.9	22.8	22.6	23.2
1958	23.0	23.6	23.3	23.6	23.1	22.5	22.1	21.9	22.9	23.0	22.6	23.2
1959	23.4	23.1	23.4	23.2	23.2	22.9	22.3	21.9	21.9	22.7	22.7	23.3
1960	22.9	22.8	22.6	22.9	23.1	22.6	22.0	22.0	22.4	22.5	23.1	23.2
1961	23.6	23.3	23.2	23.0	22.8	22.4	22.3	22.3	22.3	22.3	22.4	22.8
1962	23.3	23.1	22.8	22.8	22.7	22.2	22.3	22.1	22.4	22.5	22.6	23.1
1963	22.9	22.7	23.0	22.9	22.6	22.8	22.3	22.7	22.5	22.6	22.4	22.9
1964	23.2	23.5	23.3	23.1	22.8	22.4	22.0	22.0	22.3	22.6	22.5	22.4
1965	22.9	22.9	23.0	22.6	22.5	22.1	21.9	21.5	22.3	22.0	22.1	23.1
1966	22.5	23.2	23.0	22.6	22.7	22.2	22.0	22.2	22.4	22.7	22.4	22.8
1967	23.0	23.0	22.8	22.8	22.8	22.5	22.1	22.2	22.4	22.4	22.3	23.0
1968	23.1	22.9	22.8	22.3	22.6	22.4	22.2	22.0	22.2	22.7	23.0	23.3
1969	22.7	23.3	23.4	23.8	23.4	22.9	22.5	22.3	22.5	22.8	23.2	23.4
1970	23.4	23.4	23.8	23.0	23.2	22.8	22.5	22.4	22.3	22.9	22.8	23.0
1971	23.0	22.7	22.7	22.8	22.7	22.3	21.9	22.0	22.4	22.2	22.6	22.7
1972	22.7	22.8	22.9	23.0	23.2	22.5	22.0	21.2	22.0	22.3	23.2	23.7
1973	23.5	23.6	23.9	23.5	22.8	23.2	22.4	22.3	22.9	22.8	23.2	23.3
1974	22.8	22.7	22.9	22.7	22.6	22.8	22.5	22.3	22.4			
1987			23.8	23.3	23.5	22.5	22.5	21.8	23.1	23.7	24.1	24.0
1988	24.0	24.1	24.2	23.6	23.9	23.4	23.0	23.1	23.2	23.2	23.5	23.4
1989	23.5	23.2	23.2	23.4	23.1	22.9	22.9	22.8	23.1	23.5	24.1	24.2
1990	24.2	23.6	24.2	23.8	23.9	23.4	23.1	23.1	23.3	23.8	23.8	24.0
1991	24.3	24.1	23.8	24.0	23.8	23.9	23.2	23.4	23.1	23.3	22.9	23.5
1992	23.7	23.7	23.6	23.4	23.6	23.6	23.1	23.1	22.7	23.2	23.3	23.7
1993	23.4	23.7	23.3	23.8	23.8	23.6	22.7	21.9	22.5	22.6	23.3	24.0
1994	24.0	23.9	23.9	23.8	23.7	22.9	22.8	23.2	22.5	22.9	22.9	23.4
1995	24.3	24.3	24.0	24.0	23.9	23.3	23.1	23.5	23.2	23.6	23.8	23.7
1996	23.9	24.0	23.8	23.8	23.5	23.4	23.4	23.1	23.4	23.3	23.3	23.9
1997	23.8	24.0	23.9	23.5	23.1	22.2	23.1	22.3	22.1	21.7	22.8	24.1
Aver	23.3	23.3	23.3	23.1	23.0	22.7	22.4	22.3	22.5	22.7	22.9	23.3
Lowest	22.0	22.7	22.3	22.2	22.1	22.0	21.6	21.2	21.4	21.7	22.1	22.4
Highest	24.3	24.3	24.2	24.0	23.9	23.9	23.4	23.5	23.4	23.8	24.1	24.2
Entries	34	34	35	35	35	35	35	35	35	33	33	33

Appendix 6-6-4 Monthly Maximum Wind Gust (Knots)

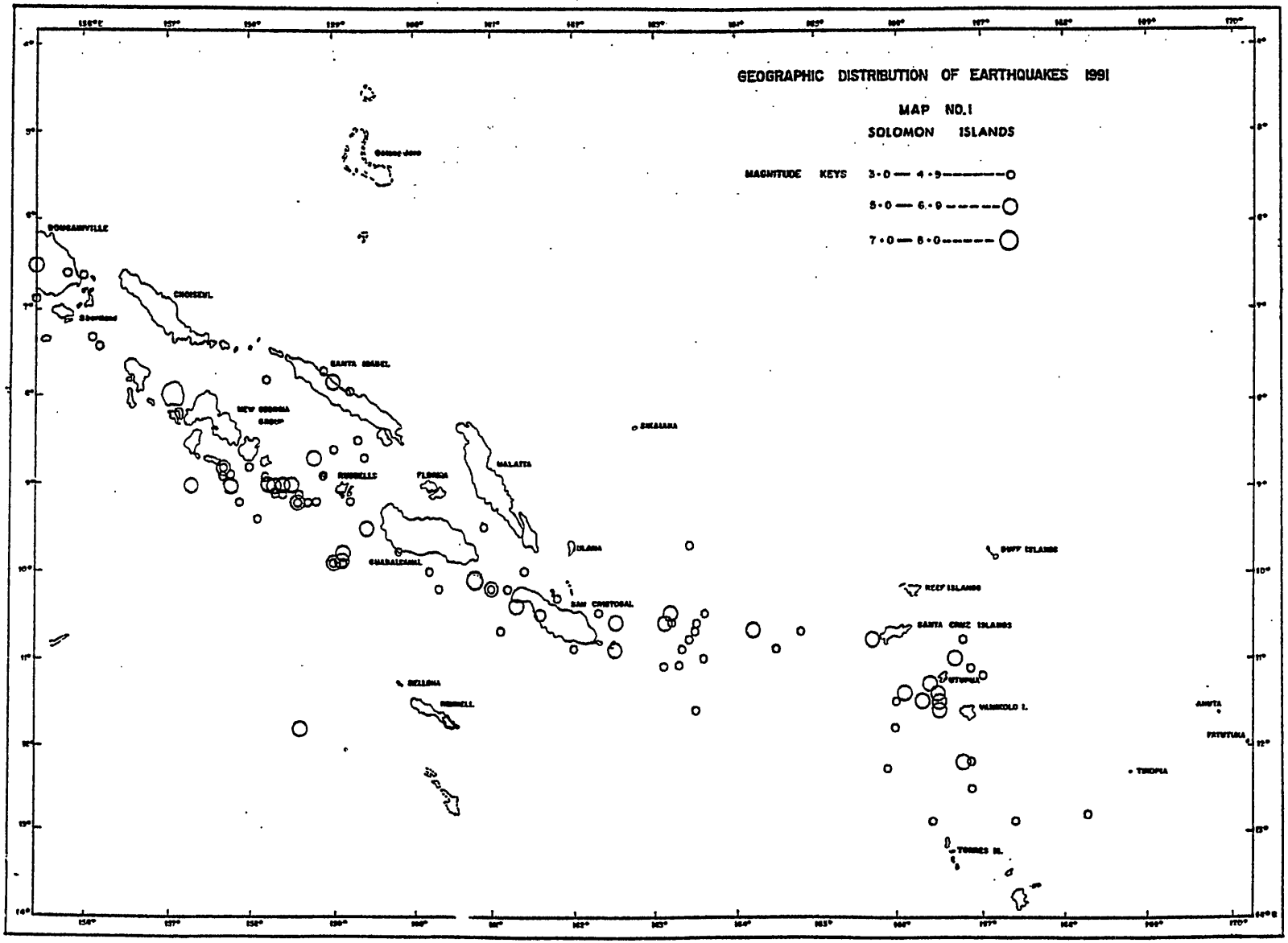
Station: Honiara **Island: Guadalcanal** **Year: 1954 - 1997**

Latitude: 09 25'S **Longitude: 159 58'E** **Elevation: 55.0 M**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1954	W/10	S/10	NW/19	S/15	E/24	E/18	E/14	NE/25	NE/18	ENE/20	NE/15	E/10
1955	SW/18	NE/20	NE/15	E/15	E/15	E/12	SE/25	E/15	NE/15	E/35	N/20	NE/20
1956	S/10	NW/15	NW/15	E/15	S/10	E/15	E/15	E/20	NE/18	NE/15	NE/21	N/21
1957	SE/20	SSE/32	NW/27	S/23	SW/23	E/39	E/26	E/36	SE/26	NE/26	SSE/26	NE/23
1958	SE/30	NW/29	NW/32	NW/26	SE/24	NW/48	SE/25	SE/28	NE/28	NE/28	ENE/32	NE/25
1959	NW/35	N/33	NW/26	NE/28	NE/24	NE/27	SE/27	E/30	SE/34	SSW/23	SSW/30	NW/47
1960	SW/23	NW/22	NNE/39	NNE/23	SE/24	ESE/29	NNE/28	SSE/28	E/34	SE/28	NNE/27	NW/26
1961	NW/26	NW/29	SW/26	SE/32	ESE/37	ESE/30	SSE/31	SE/25	ENE/28	S/25	NE/37	NW/30
1962	SSW/26	SSW/37	NE/25	ESE/30	NW/30	SSE/35	ENE/31	E/37	SSE/35	ENE/28	SSW/33	NW/25
1963	NW/25	SW/28	NW/25	NE/35	SE/27	SSE/30	SE/34	SE/15	SE/27	N/30	NW/32	N/13
1964	NE/26	NW/24	NW/17	SSE/34	ENE/32	N/26	SE/30	SSE/28	SE/31	SSE/35	W/30	N/24
1965	ENE/30	NW/27	NW/34	N/27	N/26	S/23	SSE/26	SE/25	ESE/35	SE/29	SE/23	ENE/24
1966	SW/27	NE/30	NW/32	SW/28	ESE/29	SE/34	ESE/30	SE/34	SE/31	NE/34	NNE/36	NE/26
1967	N/43	NW/29	NW/67	NW/34	SSE/32	SSE/30	SE/30	SE/29	E/26	SSE/37	SSE/29	SW/25
1968	SSW/26	NW/41	NW/30	SSE/27	SSE/26	N/36	SE/30	SSE/31	SE/36	SE/34	ENE/16	SE/30
1969	NW/55	NW/31	S/27	NW/39	SE/36	SE/29	ESE/27	ENE/42	NNE/36	ESE/32	SSE/28	SSE/23
1970	SW/32	NW/35	NW/20	SSE/41	SSW/25	NNE/30	SSE/39	SSE/28	SSE/24	SSE/20	NE/28	W/36
1971	NW/39	SW/34	N/29	NW/27	NE/30	NE/30	N/31	ESE/41	ESE/31	SE/32	NW/28	NW/46
1972	NW/69	NW/33	NW/34	W/36	NW/40	SSE/50	E/27	S/19	SSE/28	S/30	NE/26	SSW/29
1973	SE/26	SW/28	NW/28	SE/27	N/32	ESE/29	NE/29	NE/40	NE/35	SE/37	NW/31	SE/24
1974	NW/35	NW/34	S/34	SSE/30	NNE/28	E/28	E/28	ESE/40	ENE/34			
1987			SSW/10	SSW/14	E/14	NE/14	E/18	ENE/24	NE/18	NE/15	NE/14	NE/08
1988	SW/12	NW/15	NW/14	E/14	E/15	ENE/20	ENE/22	E/20	E/18	NE/12	NW/08	NW/10
1989	SW/18	NW/10	NW/14	W/12	E/10	E/16	SSW/10	NE/16	ENE/15	ENE/17	ENE/17	ENE/20
1990	W/20	W/12	SW/17	S/20	E/14	SSE/10	NE/12	NNE/12	NE/12	NE/14	SW/12	N/16
1991	W/10	SSW/14	NE/18	NNE/13	NE/11	SE/15	S/18	ENE/11	NE/14	NE/10	SW/15	S/10
1992	NNE/13	W/13	W/11	W/11	ENE/13	NE/14	NE/15	ENE/15	ENE/17	ENE/15	ENE/15	ENE/12
1993	NE/15	SW/15	NW/14	E/14	E/12	E/14	NE/12	NE/18	E/16	ENE/17	E/14	NE/14
1994	SW/14	N/14	E/10	E/13	S/14	ENE/14	NE/11	NE/14	E/16	NE/18	NE/12	SSW/12
1995	NE/12	S/10	NW/10	NE/12	ENE/12	ENE/14	ENE/17	ENE/14	E/15	NE/15	ENE/18	SW/13
1996	S/10	E/12	E/13	NE/11	NE/12	SE/14	E/12	NE/17	S/14	ENE/15	NE/12	ENE/14
1997	W/15	NW/12	W/13	ENE/16	W/12	E/12	E/15	ENE/15	ENE/13	S/12	ENE/13	ENE/13

Note:
Data from 1987 onwards only represents the highest wind speed picked from the 3 hourly observations and are not actual maximum wind gusts.
No data is available from Oct 1974 to Feb 1987

Appendix 6-6-5 Geographical Distribution of Earthquakes in Solomon Islands



App. 6-6-6 EARTHQUAKES GREATER THAN MAGNITUDE 5.6 (1/3)
IN THE SOLOMON ISLANDS FROM 1960 TO 1980

Year	Month	Depth	MB	MS
Santa Cruz Islands				
1960	Oct	40	6.0	
1961	Jan	140	6.8	
	Jan	25	7.0	
1962	Apr	36	5.5	
	May	135	6.5 - 6.8	
	Jul	114	6.6 - 6.8	
1963	Sep	43	6.3	
	Sep	17	6.1	
1965	Feb	86	5.7	
	Aug	51	5.8	
	Dec	52	5.8	
1966	Jun	228	6.1	
	Jun	60	5.5	
	Dec	56		7.7
1967	Jan	154	5.5	
	Jan	133	6.0	
	Mar	34	5.9	
	Mar	24	5.9	
	Mar	49	6.0	
	Nov	48	5.6	
	Dec	33	5.5	
1968	May	41	5.5	
	Jun	33	5.5	6.1
	Oct	60	5.9	
1969	Jan	32	6.2	6.8
	Jan	4	5.6	5.8
	Jul	34	5.5	
1970	Jan	50	5.7	6.4
	Jan	50	5.5	5.5
	May	50	5.9	6.1
1971	Nov	115	6.4	
	Nov	110	5.8	
1972	Feb	102	6.2	
	Sep	62	6.0	
1973	Jan	97	5.8	
	Jun	146	5.5	
	Dec	15	5.5	5.4
1975	Feb	33	5.4	5.5
	Sep	132	5.6	
	Sep	106	5.6	
	Oct	54	6.6	7.0
	Nov	77	5.7	
	Nov	60	5.9	
	Dec	33	6.0	5.8
	Dec	88	5.5	
1976	Feb	39	5.4	5.6
	Mar	47	6.1	5.9
	Mar	72	5.6	
	Mar	59	5.8	
	Apr	84	5.8	
1977	Jan	42	5.5	5.6
	Jan	25	5.7	5.2
	May	138	5.6	
1977	Aug	36	5.2	5.7
1978	Aug	88	5.7	
1979	May	33	5.5	5.9
	May	68	5.6	
1980	Apr	33	6.0	6.1
	Jul	33	5.9	7.5
	Jul	33	5.6	
	Jul	37	5.3	5.9
	Jul	33	5.4	5.9
	Jul	33	5.2	6.7
	Jul	33	5.6	
	Jul	33	5.8	7.9
	Jul	33	5.7	
	Jul	33	5.6	
	Jul	79	5.7	
	Jul	80	5.9	
	Aug	33	5.7	6.3
	Aug	42	4.6	5.1
	Sep	62	5.5	
	Oct	33	5.3	6.2
	Nov	33	5.5	4.6
San Cristobal				
1960	Oct	93	6.2 - 7.0	
1961	Mar	99	6.2	
1963	May	33	5.8 -6.0	
1964	Oct	68	6.0	
1965	Oct	65	5.5	
1966	Jun	37	5.5	
1966	Jul	33	5.5	
	Aug	70	5.7	
1967	Jan	21	5.7	
1970	Aug	33	5.7	5.8
	Dec	33	5.5	6.1
	Dec	36	5.3	6.5
	Dec	33	5.8	7.0
	Dec	72	6.1	
1971	Feb	90	5.9	
	Mar	42	5.8	6.4
	May	45	4.6	5.7
1972	Aug	34	5.2	6.0
	Aug	36	5.5	6.1
	Aug	33	5.2	6.1
	Aug	33	5.4	6.1
	Aug	56	5.9	
	Sep	56	5.5	
1973	Jan	32	5.6	5.8
	Jan	32	5.0	5.9
	Jun	70	6.3	
1975	Jul	79	5.9	
	Dec	33	5.6	5.7
1976	Jun	61	6.2	6.6
	Jun	54	5.5	5.3
	Aug	43	5.5	5.2
	Sep	83	5.6	

Year	Month	Depth	MB	MS
1976	Oct	106	6.0	
1977	Aug	32	5.8	5.5
	Sep	61	5.5	
	Nov	70	5.6	
	Nov	92	5.9	
1978	Nov	33	5.8	6.9
	Nov	33	6.0	
	Nov	33	5.6	
	Nov	33	5.5	5.7
	Nov	33	6.3	7.1
	Nov	33	5.7	6.1
	Nov	33	5.3	5.8
	Nov	33	5.6	5.4
	Nov	33	5.9	5.9
	Dec	93	6.0	
	Dec	30	5.6	6.3
1979	Oct	33	5.4	5.9
	Oct	22	6.1	7.1
	Oct	33	5.6	
	Oct	33	5.7	
	Oct	33	5.8	
	Oct	33	5.5	
	Oct	33	5.5	
1980	Feb	68	5.9	
Guadalcanal				
1961	Jan	50	6.5 - 6.8	
1963	Feb	30	6.5	
1964	Jul	21	5.6	
1965	Jul	41	6.0	
	Nov	41	6.0	
1966	Jun	34	6.0	
	Jun	23	7.2	
	Jun	19	5.6	
	Jun	41	5.7	
	Jun	15	5.6	
	Oct	36	5.6	
1968	Aug	538	6.2	
1972	Jun	40	5.5	
1973	Feb	62	5.9	
1975	Oct	56	5.8	
1977	Apr	33	5.4	6.7
	Apr	19	6.3	7.5
	Apr	33	6.8	7.5
	Apr	33	5.7	
	Apr	33	6.1	
	Apr	33	5.5	
	Apr	32	5.5	
	Apr	32	5.5	
	Apr	33	6.6	7.5
	Apr	33	5.8	
	Apr	33	5.6	6.0
	Apr	33	5.6	5.6
	Apr	51	5.6	6.0
	May	19	5.5	
	May	33	5.4	5.7

Year	Month	Depth	MB	MS
1977	Jun	11	b	5.7
	Jul	16	5.8	
1978	Jan	73	5.5	
	Apr	46	6.2	5.9
Russell Islands				
1963	Jun	33	5.6	
1964	Jun	17	5.6	
1965	May	50	5.6	
1974	Aug	59	5.5	
1979	Nov	30	6.0	6.1
New Georgia Islands				
1963	Jul	33	5.8	
	Aug	33	6.1	
1964	Jan	33	5.5	
	Jan	32	5.7	
	Dec	42	5.6	
1965	Oct	20	5.6	
1968	Jan	33	6.0	
	Jun	33	5.4	5.7
1969	May	16	5.6	5.2
	Sep	15	5.8	6.1
	Sep	10	5.8	5.7
	Sep	33	5.6	
1970	Apr	5	5.6	
1971	Sep	33	5.5	
1974	Mar	50	5.8	
1975	Apr	41	5.6	
	Nov	33	5.7	6.1
1976	Nov	33	6.1	6.5
1977	Mar	33	5.3	5.8
	Apr	33	5.7	
1978	Sep	33	6.0	6.2
	Sep	16	5.5	
1979	Feb	33	5.5	4.8
1980	Feb	40	5.8	5.6
Mono and Shortland Islands				
1961	Feb	5	6.8	
1966	May	37	5.5	
1967	Apr	37	5.5	
	Apr	29	5.8	
	Sep	94	5.7	
1968	Nov	169	5.7	
1971	Sep	46	5.7	
1973	Aug	62	5.8	
1974	Jan	34	6.0	7.0
	Feb	40	6.2	7.1
	Feb	33	5.4	5.6
	Feb	33	5.3	5.8
	Feb	48	5.6	5.2
	Feb	33	5.2	5.5
	Feb	43	5.4	5.6
	Mar	47	5.4	5.7
	Mar	50	5.8	6.5
	Mar	33	5.7	6.6
	May	33	5.6	5.4

Year	Month	Depth	MB	MS
1974	Jun	70	5.5	
1975	May	81	5.6	
	Jul	49	6.6	7.9
	Jul	44	6.1	7.7
	Jul	47	5.7	6.8
	Jul	95	6.1	
	Jul	33	5.5	
	Jul	36	5.7	6.1
	Jul	70	5.5	
	Jul	42	5.6	5.7
	Aug	73	5.6	
	Sep	54	5.6	
	Sep	86	5.7	
	Dec	67	5.8	
1976	Mar	45	5.8	5.2
	Apr	33	5.1	5.5
	Oct	56	5.5	
1977	Mar	31	5.5	5.8
	Jul	33	6.4	7.2
	Aug	58	5.9	
	Nov	75	5.7	

Year	Month	Depth	MB	MS
Malaita				
1963	Dec	69	5.5	
1973	Jul	69	5.5	
	Jul	30	5.4	6.0
1974	Jan	53	5.6	
1979	Jan	93	5.7	
Santa Isabel				
1968	Jun	35	5.6	5.2
1969	Jan	47	6.4	7.1
	Apr	77	5.7	
	Jun	62	6.0	
1970	Jun	69	6.1	
	Aug	67	5.9	
Choiseul				
1968	Jul	134	5.6	
1978	Sep	33	5.5	5.3

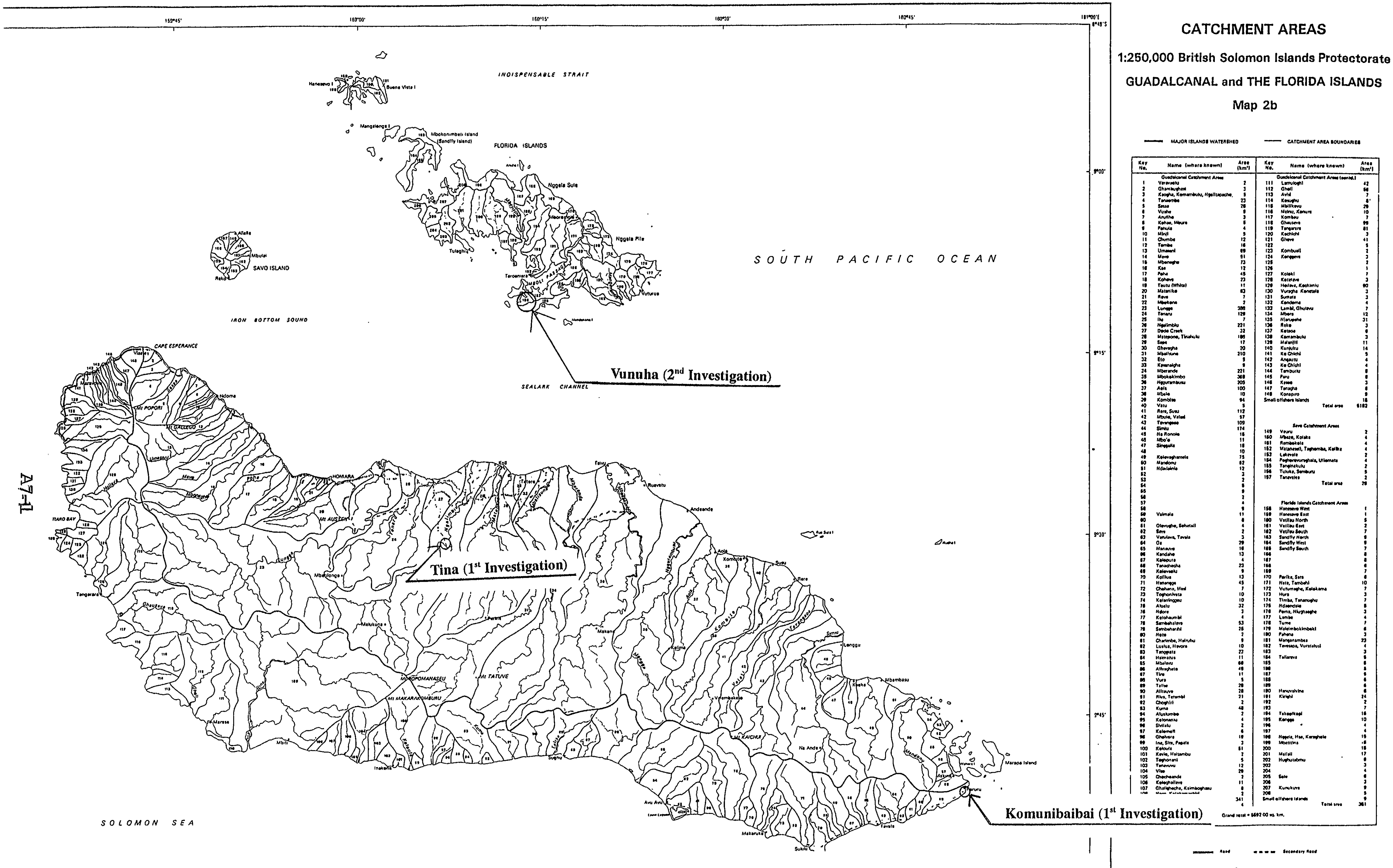
Note:

MB = Richter magnitude derived from body waves
MS = Richter magnitude derived from vertical ground

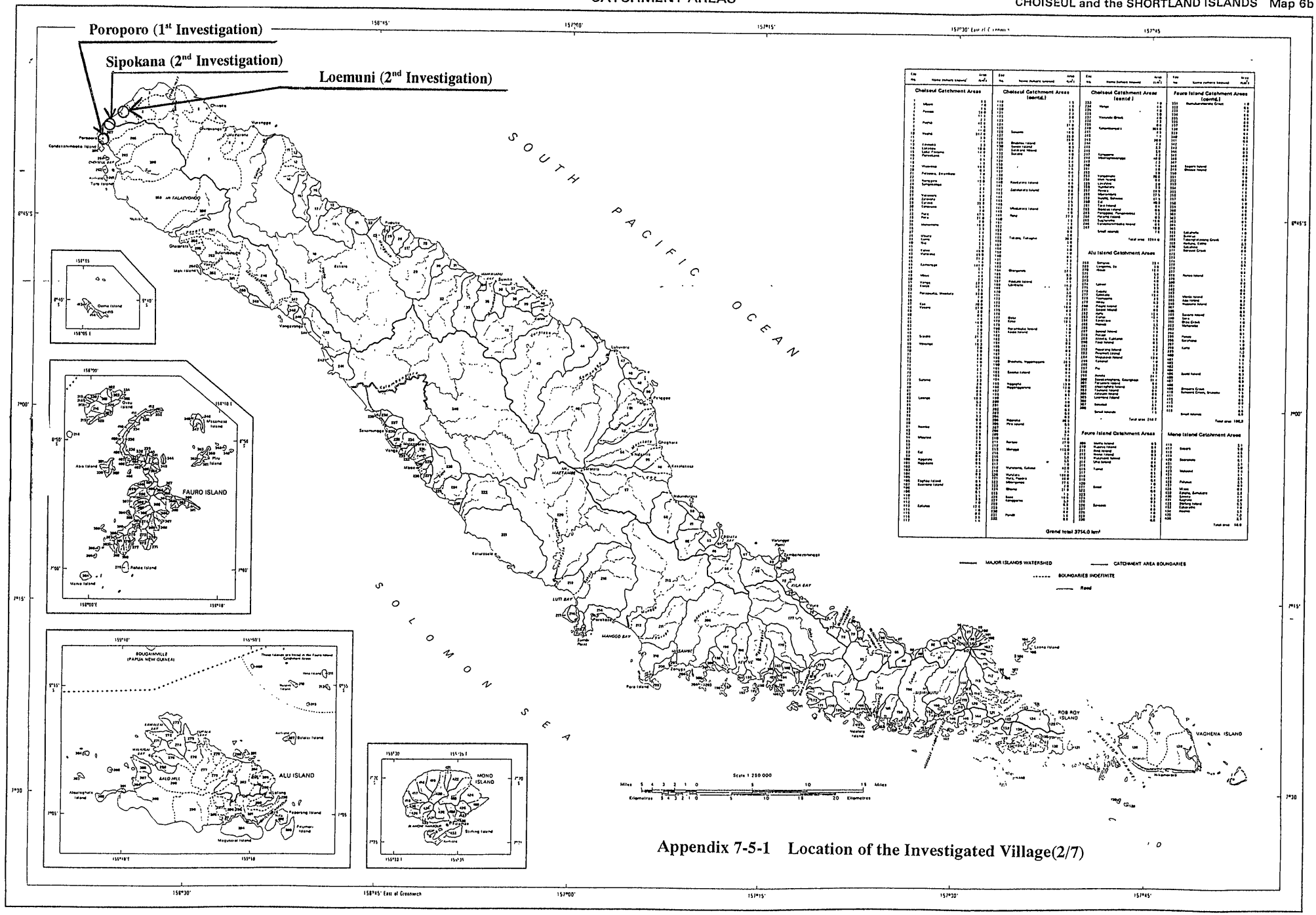
From;

Report No. 81/14, Honiara 1981
"The Regional distribution of Earthquakes greater than Magnitude 5.5 in the Solomon Islands from 1960 to 1980"
Geological Survey Division, Ministry of Lands, Energy & Natural Resources
Solomon Islands Government

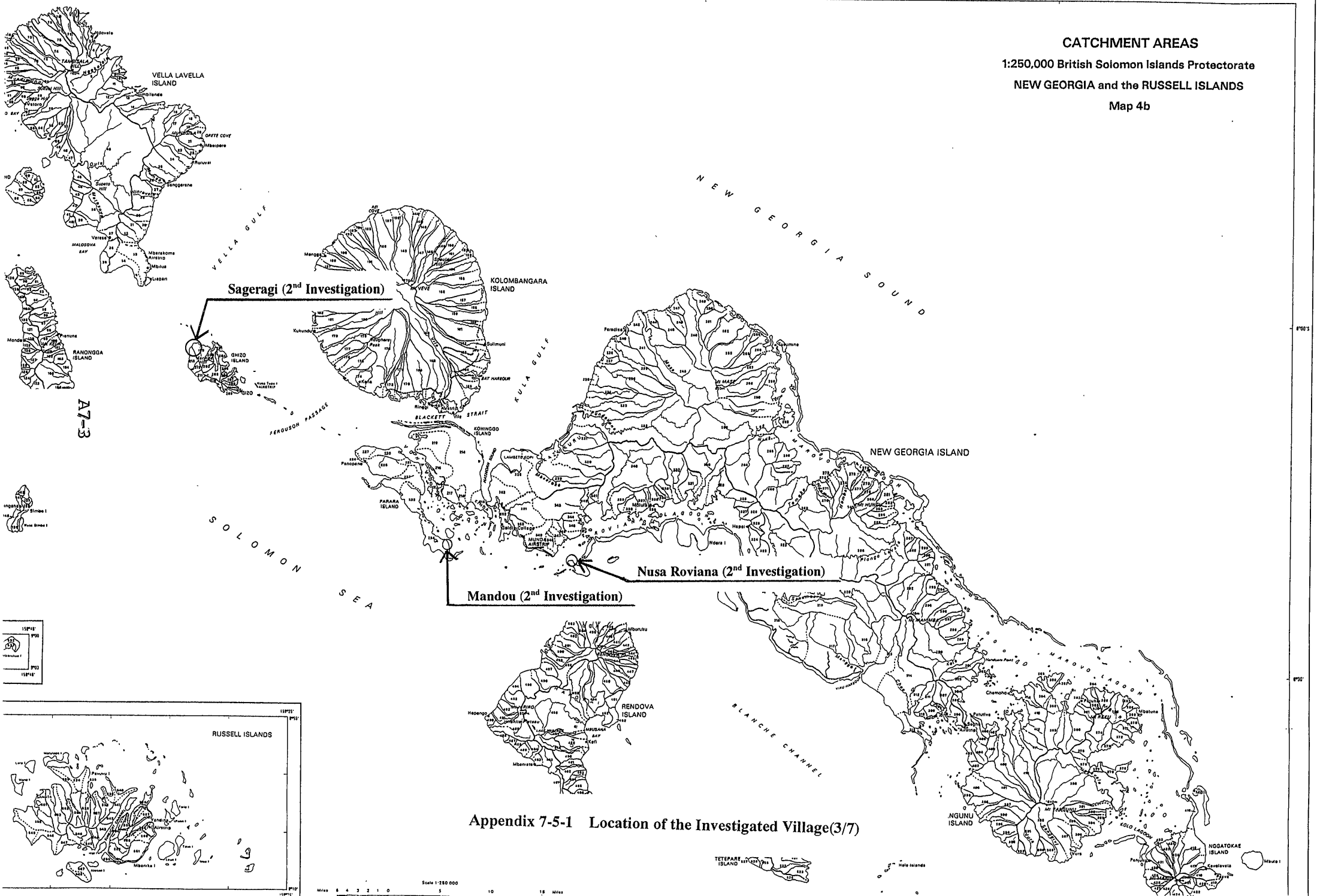
第７章　太陽光発電



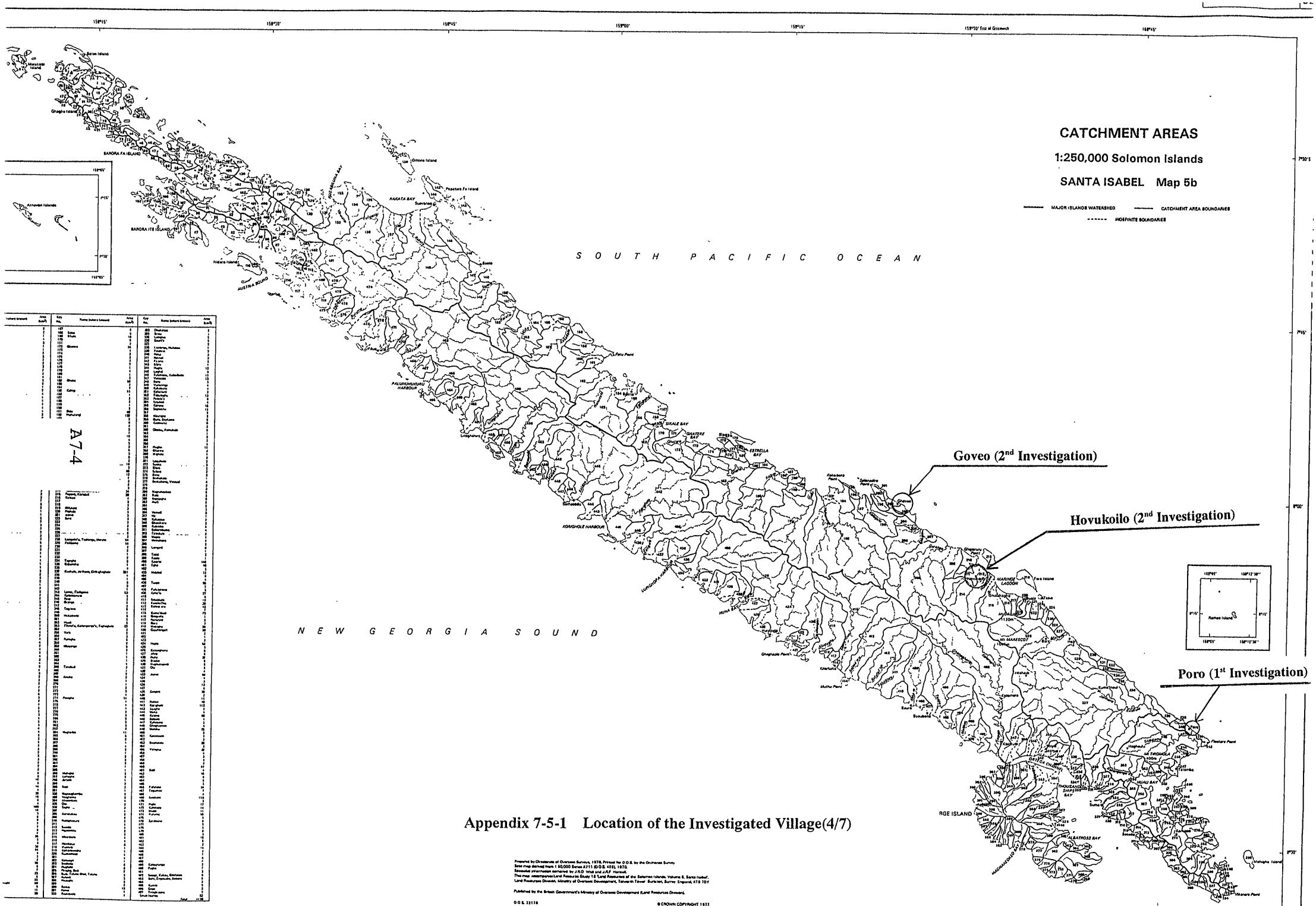
Appendix 7-5-1 Location of the Investigated Village(1/7)



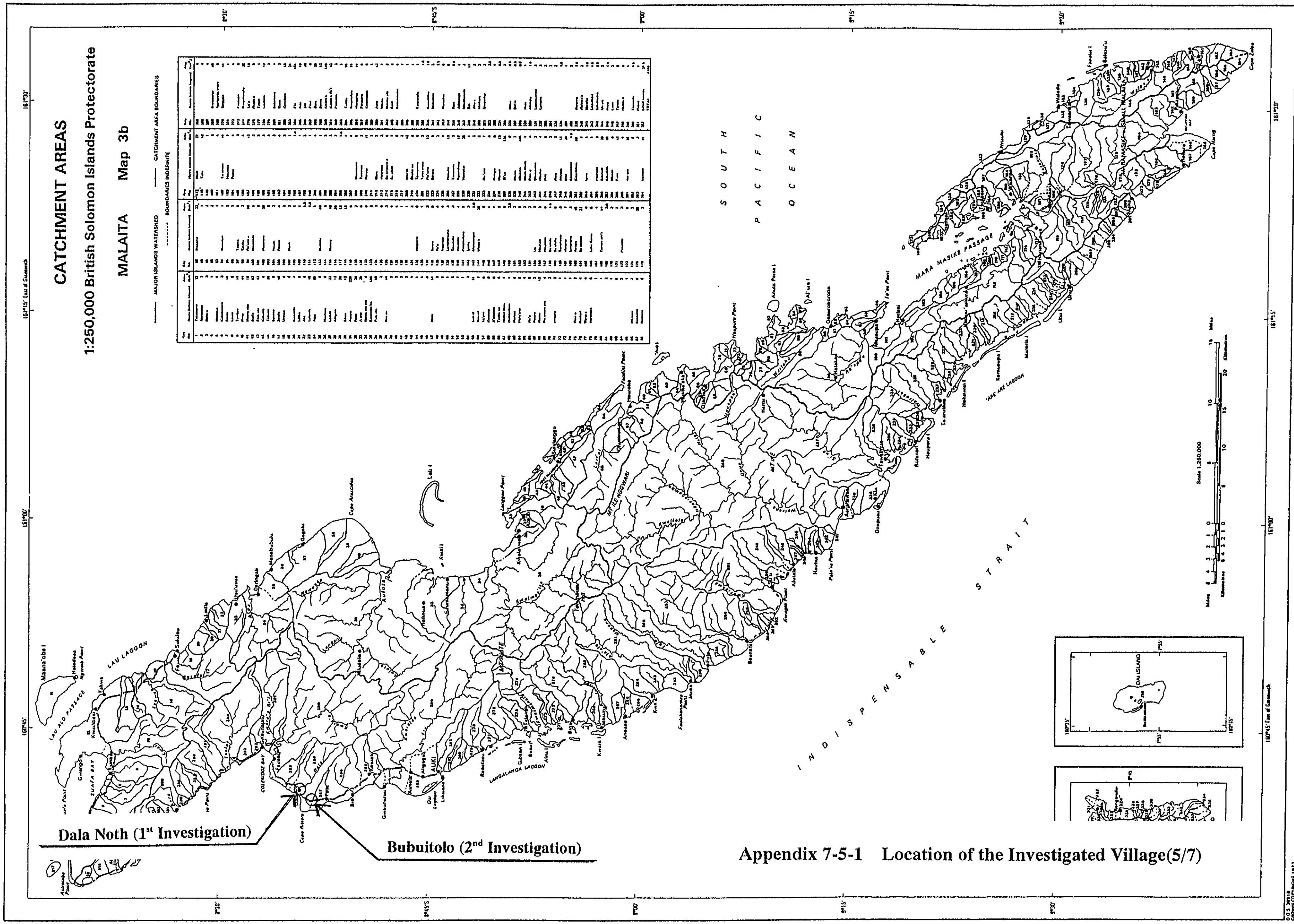
Appendix 7-5-1 Location of the Investigated Village(2/7)



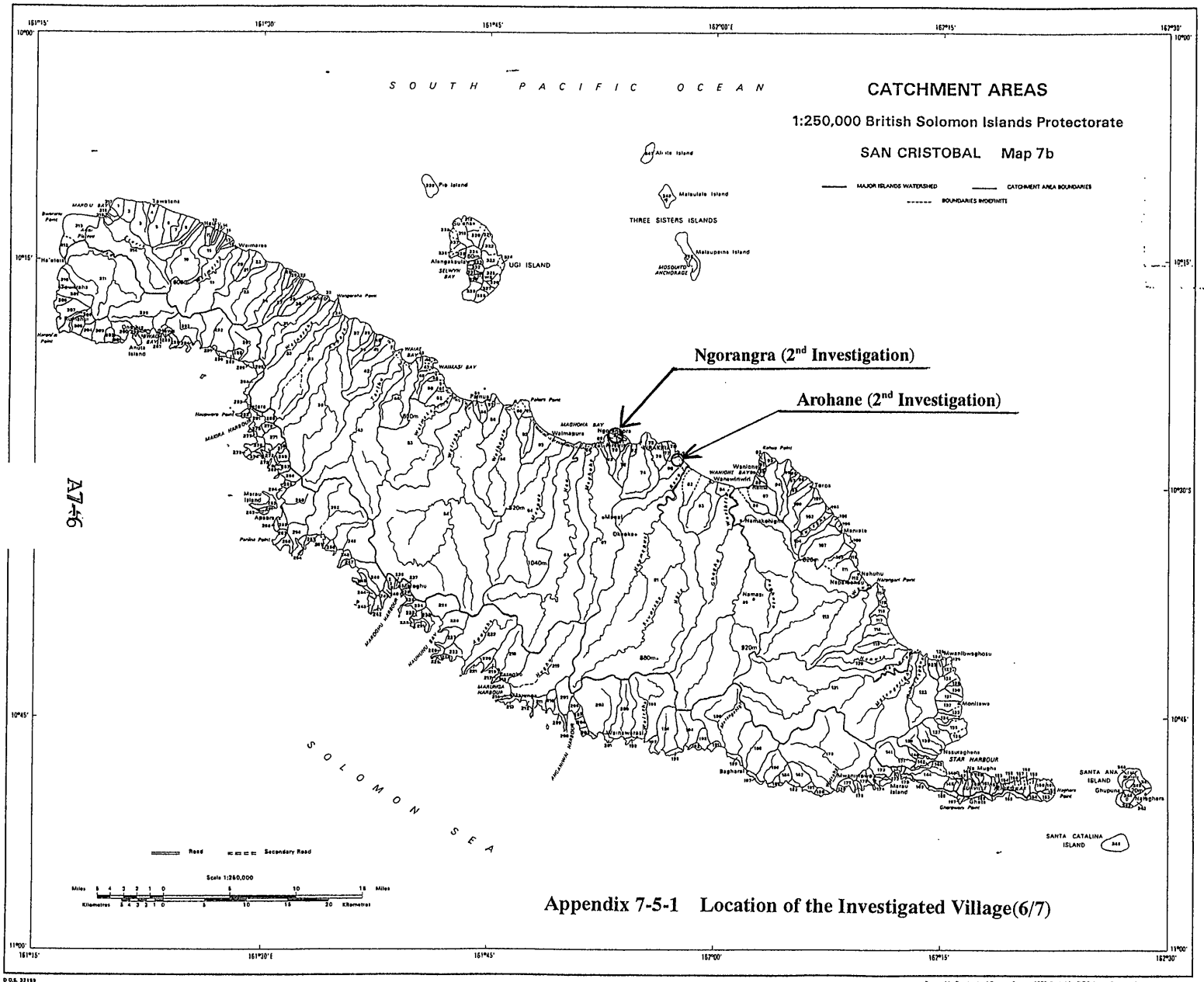
Appendix 7-5-1 Location of the Investigated Village(3/7)



Appendix 7-5-1 Location of the Investigated Village(4/7)



Appendix 7-5-1 Location of the Investigated Village(5/7)



Appendix 7-5-1 Location of the Investigated Village(6/7)

Key No	Name (where known)	Area (km²)
	San Cristobal Catchment Areas	
1	Su'u	2
2	Geonanawai	4
3	Haurua	8
4	Haurahu	2
5	Tawatana	6
6	Robo	5
7	Rino	2
8		2
9	Su uru	8
10	Wairaraha	21
11	Gaogaana	1
12		0.5
13		0.25
14		0.5
15	Tawanaubwe	4
16	Aubo	0.5
17	Rarau	0.75
18		0.5
19	Waimarae	40
20	Reeu	3
21	Wasterihu	7
22	Maneeuru	2
23	Waisora'ani	27
24	Waronaao	16
25		1
26	Mwaeho	1
27	Wanara	5
28	Waimaeo	0.5
29	Waihito	3
30	Wainuri	2
31	Wainari'i	24
32		1
33	Waiwaraha	38
34		1
35	Waitaa	25
36	Augaro	85
37		5
38		2
39		5
40		1
41		2
42	Waiapu	17
43	Tarihu	89
44	Puira	21
45		1
46		1
47	Waimwi	1.5
48	Mwaneaughu	4
49		1
50	Waitaa	4
51	Sune	1
52	Waisone	4
53	Waimwtarima	64
54	Wairaha	223
55		1
56		2
57		1
58	Waimahi	5
59	Waihaaru	60
60	Sukanaora	2
61		2
62	Aghe	8
63	Waimapuru, Peronaohe	8
64	Maapua	97
65	Hao	120
66		1
67	Maghoha	78
68		1
69	Ngarighapu	3
70	Ghiriworo	3
71		2
72	Hura	6
73		1
74	Puapua	20
75		2
76	Wainatab'ari, Paws	4
77	Tawaitara	2
78		2
79		0.5
80	Hunahae	4
81	Ravo	246
82	B'aravo	5
83	Waitaa	21
84		2
85	Warihito	237
86		4
87	Hunipora	8
88		1
89		0.5
90		0.5
91		0.5
92		0.5
93		1
94	Huni	10
95		2
96		0.5
97		1.5
98		1
99	Wairaha	2
100	Toraa	11
101	Hapheha	1.5
102	Tangeha	6
103		0.5
104	Runagha	8
105		0.5
106		0.5
107	Areghohe	15
108		2
109	Nakuhu	6
110		2
111	Manughia	6
112		1.5
113	Wau	112
114		1
115		0.5
116		2
117	Tawetame	2
118		2
119	Rahuti (Ninighoiai	8
120	Wainagho, Nanuta	20
121	Rarigha	100
122	Nakerapena	20

Key No	Name (where known)	Area (km²)
	San Cristobal Catchment Areas (contd.)	
123		2
124		1
125		0.5
126		0.5
127		1
128		3
129		1
130		2
131		3
132		3
133		2
134		2
135		3
136		1.5
137		4
138		6
139	Paghani	6
140		1
141		12
142		1
143		1
144		8
145		2
146		0.5
147		1
148		1
149		2.5
150		1
151		2
152		1.5
153		1
154		0.5
155		0.5
156		0.5
157		1.5
158		1.5
159		1.5
160		2
161		1
162		0.5
163		1
164		0.5
165		1
166		1
167		0.5
168		1
169		0.5
170		0.5
171		0.75
172		0.75
173		4
174		2
175		2
176		2
177		2
178		2
179	Wairaha	66
180		1
181		1.5
182	Wanahata	4
183		0.5
184	Marowu	2
185		1
186	Wosu	8
187		1
188	Bagharai	10
189		1
190	Matanghighi	36
191		1
192		4
193		0.5
194		10
195		1
196		11
197		2
198	Wairaha	33
199		6
200	Walhagha	12
201		0.75
202		28
203		1
204		1
205		1
206		2
207		6
208		0.5
209		1.5
210		2
211		1
212		1.5
213		1
214		0.5
215	Magharlata, Nughu	45
216		1
217		1
218	Wairmamara	16
219		0.5
220	Rete	2
221		1
222	Apurahe	31
223		2
224		0.5
225		0.75
226		0.5
227		3
228		5
229		8
230		2
231		1.5
232		0.5
233		1
234		1.5
235	Heru	1
236		1
237		1
238		0.5
239		1
240		1
241		1
242		1
243		1
244		1

Grand total = 3090 km²

Key No.	Name (where known)	Area (km²)
	San Cristobal Catchment Areas (contd.)	
245		1
246		10
247		1
248		1.5
249		1.5
250		1
251		0.5
252		34
253		1.5
254		1
255		5
256		7
257		1.5
258		0.5
259	Apeora	2
260		16
261		0.5
262		0.5
263		7
264		1
265		1
266		7
267	Hunara	1
268		0.5
269	Makira	2
270		0.5
271	Waiwora	4
272		0.5
273		0.5
274		1
275		0.5
276		2
277		0.5
278		2
279	A'orou	1.5
280	Manawou	2
281		0.5
282		1
283		0.5
284		1.5
285	Bora	1.5
286		0.5
287		13
288	Wairaha	1.5
289		0.75
290		0.5
291		0.25
292		16
293	Wairaha	11
294		1.5
295		1.5
296		1
297		1
298	Bwaibwa	25
299		1
300	Tawado's	1
301		1
302		2
303		5
304		3
305		3
306	Maetawa	4
307		6
308		2
309		4
310		3
311	Hada	85
312	Waisuhila	3
313		10
314	Etaela	41
315		0.5
316		0.5
317	Abonu	0.5
Small offshore islands		3
	Total area	3022
	Ugi Island Catchment Areas	
318		4
319		3
320		3
321		1.5
322	Reunangeli	2.5
323	Weiheungurunguru	3
324		0.5
325	Walpanla	2.5
326		1.5
327		1.5
328		1.5
329		4
330		1.5
331	Ulahu 'Esi'ato	1
332	Mwaniuwa	1
333		1
334	Nemo	3
335	Waimasi	1
336	Pore	1.5
337		1
338		0.5
339		2
	Total area	42
	Santa Ana Catchment Areas	
340		2
341		1.5
342		2
343		1
344	Lake Waoiapola	1.5
345	Lake Wairaia	3
	Total area	11
	Santa Catalina	
346		3
	Three Sisters	
347		3
348		3
349		6
	Total area	12

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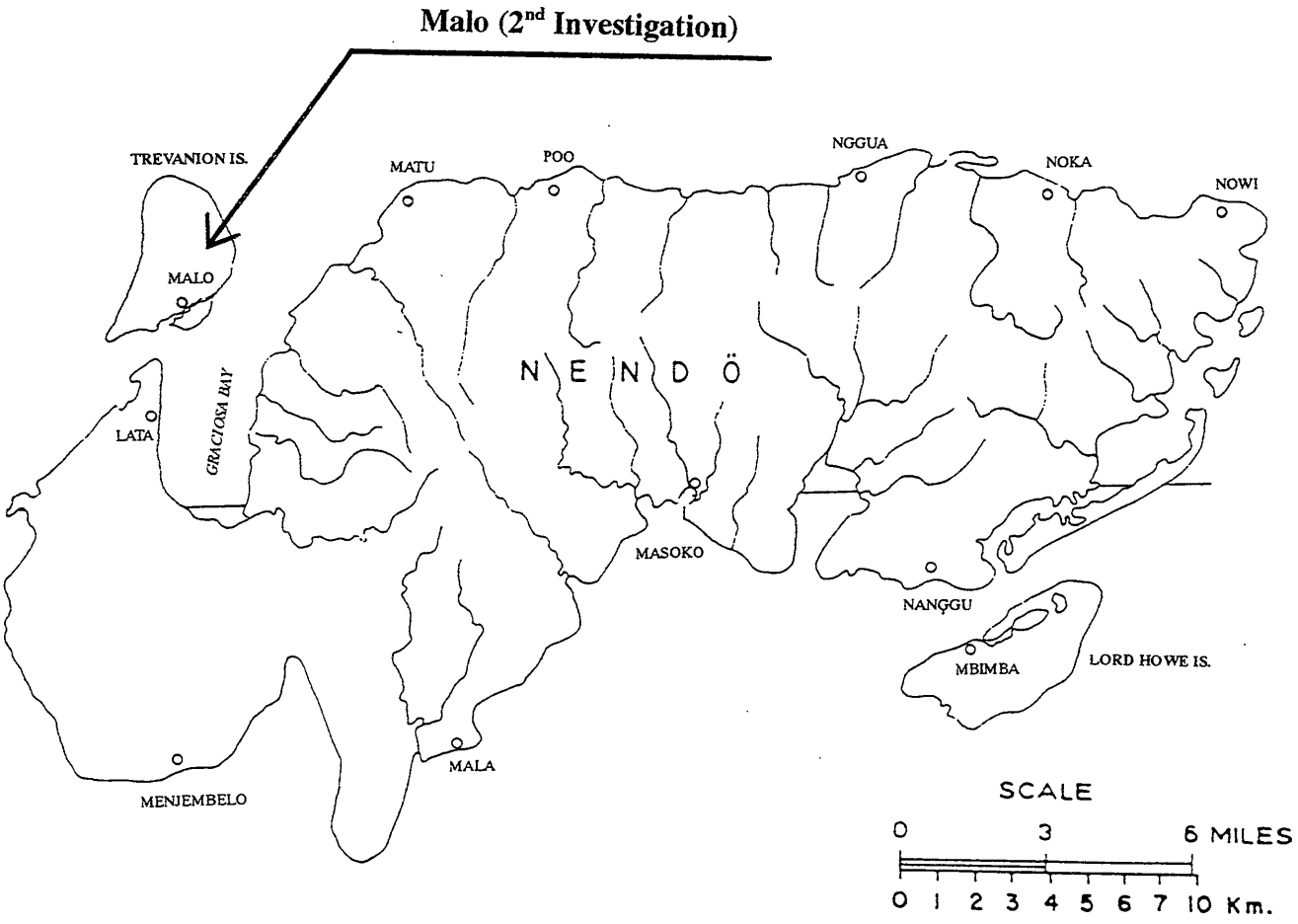


Appendix 7-5-1 Location of the Investigated Village(7/7)

JAPAN INTERNATIONAL COOPERATION AGENCY	MASTER PLAN STUDY OF POWER DEVELOPMENT IN SOLOMON ISLANDS	TITLE
TOKYO ELECTRIC POWER SERVICES CO., LTD. IC NET CO., LTD		

Appendix 7-5-2(1) Result of the Second Site Survey（1/3)

Village name			Sipokana	Loemuni	Sageragi	Ngorangora	Arohane	Goveo
Date and weather			10/27, Clear	10/27, Clear	11/1, Clear	11/9, Clear	11/9, Clear	11/13, Clear
Area	Province/Ward Name		Choiseul/Bataba	Choiseul/Bataba	Western/Gizo	Makira/Bauro Central	Makira/Bauro Central	Santa Isabel/Kokota
	Island name		Choiseul	Choiseul	Gizo	Makira	Makira	Isabel
	Houses are scattered or concentrated		Scattered	concentrated	concentrated	concentrated	concentrated	concentrated
Average number of rooms			3(bed room 2, sitting room 1)	4(bed room 3, sitting room 1)	3(bed room 2, sitting room 1)	4(bed room 3, sitting room 1)	4(bed room 3, sitting room 1)	4(bed room 3, sitting room 1)
means of communication			nothing (at Leomuni village)	a wireless radio with Solar	telephone with solar or wireless radio with solar	nothing(at Kirakira)	nothing(at Kirakira)	nothing(at Buala)
Are there any electrification plan			nothing	nothing	nothing	nothing	nothing	nothing
Nearest accommodation			Sipozae Guesthouse	Sipozae Guesthouse	Gizo	Kirakira	Kirakira	Buala
Number of households			26	36	39	39	40	52
Population			110	336	350	500	280	358
Nearest air field name			Taro	Taro	Gizo	Kirakira	Kirakira	Fera
Number of flight a week			3	3	3/day	4	4	3
Transportation to the village	by Out of Boat Motor,OBM	from where?	Taro	Taro	Gizo	-----	-----	Buala
		How long does it take	20-45 minutes by OBM 2 hours by Conoe	30-60 minutes by OBM	5 minutes by 40 HP OBM 45 minutes by 9.9 HP OBM	-----	-----	1 hour by 25 HP OBM 2 hours by 9.9 HP OBM
	by truck	from where?	---	---	Gizo	Kirakira air field	7 km from Kirakira	---
		How long does it take	---	---	60 minutes	5 minutes by car	20 minutes by truck	---
What's been used for lighting			kerosene lamp	kerosene lamp	kerosene lamp	kerosene lamp	kerosene lamp	kerosene lamp
Are there any shops for a living			3 private shops	2 private shops	4 private shops	3 private shops	2 private shops	3 private shops
Whether labor is available for a SHS construction			available	available	available	available	available	available
Labor cost (SB$/day・man) Regular working hour: 8 - 12, 13 - 16, Overtime work pay: weekday (1.5 times), Saturday (2 times), Sunday (3 times)			free for community work, 15 SB$/day for other purpose	free for community work, 15-20 SB$/day for other purpose	free for community work, 10-20 SB$/day for other purpose	free for community work, 10-20 SB$/day for other purpose	free for community work, 10 SB$/day for other purpose	free for community work, 30 SB$/day for other purpose
Transportation costs of ship and car		Ship	from Taro 60-90 SB$ /day/round-trip (OBM:10-15/day, Driver:20-30/day, Fuel:30-45/round-trip)	from Taro 55-60 SB$ /day/round-trip (OBM with driver: 25-30/day, fuel:30/round-trip)	from Gizo 75-85 SB$ /day/round-trip (OBM(9.9HP) with driver:25/day, fuel:50-60/round-trip)	----	----	from Buala: 112 (SB$/day/round-trip) by boat (15 HP, 21 feet long, fuel:20 liter) canoe rate:1$/(1 foot long)/day, screw rate:1$/HP/day driver:20/day, fuel:2.8/liter
		Car	---	---	from Gizo 70SB$ /day/round-trip (driver:10/day, pickup truck:60/round-trip)	truck:Hilux(1.5t) Provincial Government owns…53 SB$/h (including driver and fuel)	truck:Hilux(1.5t) Provincial Government owns…53 SB$/h (including driver and fuel)	---
Are three any public facilities		School	nothing	primary school	nothing	primary school, kindergarten	primary school	primary school
		Clinic	nothing	health aid post	health aid post	nothing	nothing	health aid post
		Church	a church evening service: every day 6:30-8:30pm	a church evening service :Mon to Fri and Sun, 6-7pm	2 churches evening service: Mon to Sun, 7:30-9pm	2 churches evening service: Mon to Sun, 6:30-7:30pm	evening service: Mon to Sun, 6-8pm	a church evening service: Mon to Sat: 5-5:30pm (Sun: 5-6pm)
		others	meeting house	meeting house	meeting house	nothing	nothing	nothing

Appendix 7-5-2(1) Result of the Second Site Survey（2/3)

Village name			Sipokana	Loemuni	Sageragi	Ngorangora	Arohane	Goveo
Average income in a household	Monthly income (SB$/month)		unsure	50	150	200	160	100
	Source of income	Percentage of agriculture income in total income (%)	90%	100%	80%	100%	100%	90%
		Kind of farm produce to sell	copra (mainly), vegetables(taro, sweet potato), fruits(banana)	copra, vegetables(bean, pepper, sweet potato, corn)	copra, vegetables	copra, cocoa, pork, chicken, vegetables(sweet potato, peanut, cabbage), fruits(banana, pineapple)	copra, cocoa, vegetables (sweet potato, cabbage, tomato, bean, cucumber), banana	copra, vegetables(yam, cassava, sweet potato), fruits(banana, papaya)
		Percentage of fishery income in total income (%)	10%	0%	20%	0%	0%	10%
		Kind of fish to sell	reef fish, marine products(dried sea cucumber, trochus for shellwork)	home consumption only	reef fish, tuna, king fish	----	----	reef fish, marine products(dried sea cucumber, trochus for shellwork)
Kind of electrical appliances	Private house	Flashlight	1.5*(3-4)=4.5-6 V	1.5*3=4.5 V	1.5*(3-4)=4.5-6 V	1.5*(2-4)=3-6 V	1.5*(2-6)=3-9 V	1.5*(4-8)=6-12 V
		Radio	1.5*(6-8)=9-12 V	1.5*6=9 V	1.5*(6-8)=9-12 V	1.5*(6-8)=9-12 V	1.5*(6-12)=9-18 V	1.5*(6-8)=9-12 V
		Radio-cassette						
		others	nothing	nothing	nothing	nothing	nothing	nothing
	School	Flashlight	-----	nothing	-----	1.5*(2-4)=3-6 V	nothing	nothing
		Radio	-----	nothing	-----	1.5*(6-8)=9-12 V	nothing	nothing
		Radio-cassette	-----	nothing	-----		nothing	nothing
		others	-----	nothing	-----	nothing	nothing	nothing
	Church	Flashlight	nothing	nothing	nothing	nothing	nothing	nothing
		Radio	nothing	nothing	nothing	nothing	nothing	nothing
		Radio-cassette	nothing	nothing	nothing	nothing	nothing	nothing
		others	nothing	nothing	keyboard	nothing	nothing	nothing
	Clinic	Flashlight	-----	nothing	nothing	-----	----	nothing
		Radio	-----	nothing	nothing	-----	----	nothing
		Radio-cassette	-----	nothing	nothing	-----	----	nothing
		others	-----	nothing	nothing	-----	----	nothing
	Community hall	Flashlight	nothing	nothing	nothing	-----	nothing	nothing
		Radio	nothing	nothing	nothing	-----	nothing	nothing
		Radio-cassette	nothing	nothing	nothing	-----	nothing	nothing
		others	nothing	nothing	nothing	-----	nothing	nothing

Appendix 7-5-2(1) Result of the Second Site Survey（3/3)

Village name			Sipokana	Loemuni	Sageragi	Ngorangora	Arohane	Goveo
Kerosene situations	Price (SB$/liter)		2.5	2.5	2.5	2.7	3.0	3.0
	How to buy/means of purchase		shop in village	shop in village	shop in village	at Kirakira	shop in village	shop in village
	Private house raising babies	Using time (hour/day)	12 (6pm-6am)	12 (6pm-6am)	12 (6pm-6am)	12 (6pm-6am)	12 (6pm-6am)	12 (6pm-6am)
		Monthly consumption (liter/m.)	8	unsure	10	9	2	11
		Monthly expenses (SB$/m.)	20	unsure	25	24	6	33
	Private house no babies	Using time (hour/day)	3.5 (6:30-10pm)	3.5 (6:30-10pm)	3 (6:30-9:30pm)	3 (6-9pm)	2 (6-8pm)	4 (6-10pm)
		Monthly consumption (liter/m.)	2	unsure	3.3	4.5	2	10
		Monthly expenses (SB$/m.)	5	unsure	8	12	6	30
	School	Using time (hour/day)	-----	no need for a day school	-----	8-9pm for entrance exam. (standard class 5,6)	no need for a day school	7-8pm for entrance exam.
		Monthly consumption (liter/m.)	-----		-----	unsure		18
		Monthly expenses (SB$/m.)	-----		-----	unsure		54
		Who pay	-----		-----	----		-----
	Church	Using time (hour/day)	pressure type lamp, tilley lamp 2 (6:30-8:30pm)	4 hurricane lamps 1 (6-7pm)	a hurricane and a tilley lamp 1.5 (7:30-9pm)	three hurricane lamps 1 (6:30-7:30pm)	a hurricane lamp 2 (6-8pm), 5 (6-11pm, Sat.)	a tilley lamp 1h (every Sunday)
		Monthly consumption (liter/m.)	10	unsure	16	4	12	4
		Monthly expenses (SB$/m.)	25	unsure	40	11	36	12
		Who pay	Church Committee	Church Committee	Church Committee	Church Committee	Church Committee	Church Committee
	Clinic	Using time (hour/day)	-----	as the need arises	as the need arises	as the need arises	----	24 hour for medical ice box
		Monthly consumption (liter/m.)	-----	unsure	unsure	unsure	----	60 SB$ for a kerosene medical ice box
		Monthly expenses (SB$/m.)	-----	unsure	unsure	unsure	----	180
		Who pay	-----	patients	patients	patients	----	province
Dry cell situations	Price (SB$/one)		3	2.5	2.5	2.2	2	2.3
	Private house	Monthly consumption (pieces/m.)	unsure F/L: 3/month R/C: 8/3days	unsure	unsure	unsure	unsure	F/L: 3/5 days R/C: 8/3 days
		Monthly expenses (SB$/m.)	unsure	unsure	unsure	unsure	unsure	unsure
	School	Monthly consumption (pieces/m.)	-----	-----	-----	----	----	----
		Monthly expenses (SB$/m.)	-----	-----	-----	----	----	----
		Who pay	-----	-----	-----	----	----	----
	Church	Monthly consumption (pieces/m.)	-----	-----	unsure	----	----	----
		Monthly expenses (SB$/m.)	-----	-----	unsure	----	----	----
		Who pay	-----	-----	----	----	----	----
	Clinic	Monthly consumption (pieces/m.)	-----	-----	-----	----	----	----
		Monthly expenses (SB$/m.)	-----	-----	-----	----	----	----
		Who pay	-----	-----	-----	----	----	----
What kinds of electrical appliances will be required first after electrification			1st: lights (sitting room), 2nd: outlet	1st: lights (sitting room), 2nd: outlet	1st: lights 2nd: outlet	1st: lights (sitting room), 2nd: outlet	1st: lights (center of house), 2nd: outlet	1st: lights (center of house), 2nd: outlet

Appendix 7-5-2(2) Result of the Second Site Survey (1/3)

Village name			Hovikoilo	Malo	Vunuha	Bubuitolo	Nusa Roviana	Mandou
Date and weather			11/13, Clear/Rain	11/18, Rain	11/23, Clear	11/25, Clear	11/29, Clear/Rain	11/30, Clear/Rain
Area	Province/Ward Name		Santa Isabel/Hovikoilo	Temotu/Neo	Central/South West Gela	Malaita/Fauabu	Western/Nusa Roviana	Western/Parara
	Island name		Isabel	Trevanion	Frolida	Malaita	Nusa roviana	Parara
	Houses are scattered or concentrated		concentrated	scattered	concentrated	concentrated	scattered	concentrated
Average number of rooms			3(bed room 2, sitting room 1)	3(bed room 2, sitting room 1)	4(bed room 3, sitting room 1)	3(bed room 2, sitting room 1)	3(bed room 2, sitting room 1)	3(bed room 2, sitting room 1)
means of communication			nothing(at Buala)	nothing(at Lata)	nothing(at Tulagi by canoe)	nothing(at Auki)	Radio with Solar (PV:40W, B:120Ah, C/C:12V,4A)	Radio with dry cell
Are there any electrification plan			nothing	nothing	nothing	nothing	nothing	nothing
Nearest accommodation			Buala	Lata	guest house(under construction:no electricity)	Auki	Munda	Munda
Number of households			120	125	86	45	83	200
Population			700	630	500	400	500	1,000
Nearest air field name			Fera	Lata	----	Auki	Munda	Munda, Noro, Gizo, Lola
Number of flight a week			3	2	----	14	14	14
Transportation to the village	by Out of Boat Motor,OBM	from where?	Buala	Lata	Honiara	---	Munda	Noro
		How long does it take	45 minutes by 9.9 HP OBM 2 hours on foot	5 minutes by 25 HP OBM	1.5 hours by 70 HP OBM	---	15 minutes by 9.9 HP OBM, 10 minutes by 25 HP OBM	1 hour by boat
	by truck	from where?	---	---	---	Auki	---	---
		How long does it take	---	---	---	1 hour by truck	---	---
What's been used for lighting			kerosene lamp	kerosene lamp	kerosene lamp	kerosene lamp	kerosene lamp	kerosene lamp
Are there any shops for a living			6 private shops	6 private shops	2 private shops	2 private shops	4 private shops	6 private shops, 1 community shop
Whether labor is available for a SHS construction			available	available	available	available	available	available
Labor cost (SB$/day・man) Regular working hour: 8 - 12, 13 - 16, Overtime work pay: weekday (1.5 times), Saturday (2 times), Sunday (3 times)			free for community work, 10 SB$/day for other purpose	free for community work, 50 SB$/day for other purpose	free for community work, 20 SB$/day for other purpose	free for community work, 10 SB$/day for other purpose	free for community work, 10 SB$/day for other purpose	free for community work, 10 SB$/day for other purpose
Transportation costs of ship and car		Ship	from Buala: 58 (SB$/day/round-trip) by boat (9.9/15/25 HP, fuel:10 liter) (OBM with driver:30/day, fuel:2.8/liter)	from Lata: 30 (SB$/round-trip) by boat (including driver and fuel)	from Honiara: 300 (SB$/round-trip) by boat (including driver and fuel) from Tulagi: 150 (SB$/round-trip) by boat (including driver and fuel)	---	from Munda : 95 SB$/round- trip, OBM: 50 SB$/day (including driver), fuel: 15 liter (2.8-3.2 SB$/l)	from Noro : 95 SB$/round- trip, OBM: 50 SB$/day (including driver, doesn't depend on HP), fuel: 15 liter (3 SB$/l)
		Car	---	---	---	from Auki, 200 SB$/one-way/3t truckr (including driver and fuel)	---	---
Are three any public facilities		School	kindergarten	primary school	kindergarten	nothing	primary school	primary school
		Clinic	nothing, (at Guguha 2 km way from the village)	health aid post	nothing, (at Koilovala 3.2 km way from the village)	nothing, (at Gwaunoa 9 km way)	health aid post	village health to worker
		Church	a church evening service: Mon to Sun: 6-7pm (Holy Communion, twice a month: 6-8pm)	three church evening service: Mon to Sun: 6-8pm	a church evening service: Mon to Sun: 6-7:30pm	a church evening service: Mon to Sun: 6-7pm	three church evening service: Sun: 5-10pm	a church evening service: 8-11pm (Mon, Wed, Fri, and Sun)
		others	meeting house	nothing	nothing	nothing	meeting house, dining house	---

Appendix 7-5-2(2) Result of the Second Site Survey (2/3)

Village name			Hovikoilo	Malo	Vunuha	Bubuitolo	Nusa Roviana	Mandou
Average income in a household	Monthly income (SB$/month)		230	200	800	100	500	500
	Source of income	Percentage of agriculture income in total income (%)	100%	90%	30%	100%	50%	70%
		Kind of farm produce to sell	copra, vegetables(tomato, cassava, sweet potato, taro, cucumber), banana *note:15-20 SB$/(a 25kg basket of sweet potato)	copra, cocoa, vegetables(beans, tomato, cabbage)	200-300 SB$/family by selling farm productsat at Honiara or Tulagi which are copra, coconut, vegetables(beans, tomato, cabbage, corn), and banana	copra, coconut, vegetables(beans, cabbage) (copra: 2 SB$/10 pieces, coconut: 1 SB$/piece)	women's share: 50 SB$/5days/week by selling farm products,	copra(mainly), vegetable, fruits
		Percentage of fishery income in total income (%)	0%	10%	70%	0%	50%	30%
		Kind of fish to sell	----	reef fish	fish: 1,000 SB$/week/(6-8 people) at Honiara, marine products(sea cucumber, trochus)	---	men's share: 50 SB$/5days/week by selling marine products (trochus, dried sea cucumber, shark fin)	reef fish
Kind of electrical appliances	Private house	Flashlight	1.5*(2-4)=3-6 V	1.5*(2-4)=3-6 V	1.5*(2-3)=3-4.5 V	1.5*3 =4.5 V	three familes own a small generator, (two of three are: 0.7 kW, 240V (YAMAHA EF1000) and 4.3 kW, 240V (Fuji Heavy Industry RGB5000)	1.5*3=4.5 V
		Radio Radio-cassette	1.5*(4-6)=6-9 V	1.5*(6-8)=9-12 V	1.5*(6-8)=9-12 V	1.5*(6-8)=9-12 V		1.5*(6-8)=9-12 V
		others	nothing	nothing	nothing	nothing		nothing
	School	Flashlight	-----	nothing	-----	---	nothing	nothing
		Radio	-----	nothing	-----	---	nothing	nothing
		Radio-cassette	-----	nothing	-----	---	nothing	nothing
		others	-----	nothing	-----	---	nothing	nothing
	Church	Flashlight	nothing	two churces own generator: 2 kVA, Honda EG2200 one of three owns fluorescent light: 40W*2, 20W*1	fluorescent light: 40W*9 (being supplied from private generator of 4.3kW, 240V Fuji Heavy Industry as a donation)	nothing	ceiling fan: 100W*3 fluorescent light: 40W*5 light bulb: 40W*4	nothing
		Radio	nothing			nothing		nothing
		Radio-cassette	nothing			nothing		nothing
		others	nothing			nothing		nothing
	Clinic	Flashlight	-----	nothing	-----	-----	nothing	nothing
		Radio	-----	nothing	-----	-----	nothing	nothing
		Radio-cassette	-----	nothing	-----	-----	nothing	nothing
		others	-----	nothing	-----	-----	nothing	nothing
	Community hall	Flashlight	nothing	nothing	-----	-----	fluorescent light:40W*2(each of meeting housel and dining house), (generator supply church, meeting house, and dining house:Rating, 1.7kW, 240V, Fuji heavy Industry, Robin)	---
		Radio	nothing	nothing	-----	-----		---
		Radio-cassette	nothing	nothing	-----	-----		---
		others	nothing	nothing	-----	-----		---

Appendix 7-5-2(2) Result of the Second Site Survey (3/3)

Village name			Hovikoilo	Malo	Vunuha	Bubuitolo	Nusa Roviana	Mandou
Kerosene situations	Price (SB$/liter)		3.0	3.0	2.0	2.9	2.9	2.5
	How to buy/means of purchase		shop in village	Lata	shop in village	shop in village	shop in village	shop in village
	Private house raising babies	Using time (hour/day)	12 (6pm-6am)	12 (6pm-6am)	12 (6pm-6am)	12 (6pm-6am)	12 (6pm-6am)	11 (6pm-5am)
		Monthly consumption (liter/m.)	2	5	10-20	11	15	15
		Monthly expenses (SB$/m.)	6	15	20-40	30	43	38
	Private house no babies	Using time (hour/day)	4 (6-10pm)	4 (6-10pm)	4 (6-10pm)	4 (6-10pm)	3 (7-10pm)	4 (6-10pm)
		Monthly consumption (liter/m.)	2	5	10	5	8	15
		Monthly expenses (SB$/m.)	6	15	20	15	21	38
	School	Using time (hour/day)	-----	no need for a day school	-----	---	basically no need for a day school, but one study room and one staff room are sometimes needed	no need for a day school
		Monthly consumption (liter/m.)	-----		-----	---		
		Monthly expenses (SB$/m.)	-----		-----	---		
		Who pay	-----		-----	---		
	Church	Using time (hour/day)	one or two tilley lamp 1 (6-7pm), 1 lamp 2 (twice a month), 2 lamps	two or three tilley lamps 2 (6-8pm)	two tilley lamps 1.5 (6-7:30pm)	one tilley lamp 1 (6-7pm)	electrified	one tilley(Mon,Wed,Fri), 3 tilley(Sun) 3(8-11pm)
		Monthly consumption (liter/m.)	unsure	3.5	28	1*350ml/1hour		24
		Monthly expenses (SB$/m.)	unsure	11	56	30		60
		Who pay	Church Committee	Church Committee	Church Committee	Church Committee	Church Committee	Community store
	Clinic	Using time (hour/day)	----	as the need arises	----	---	as the need arises	nothing
		Monthly consumption (liter/m.)	----	unsure	----	---	unsure	nothing
		Monthly expenses (SB$/m.)	----	unsure	----	---	unsure	nothing
		Who pay	----	patients	----	---	village head	nothing
Dry cell situations	Price (SB$/one)		2.4	----	2.4	2.5	1.8	2.4
	Private house	Monthly consumption (pieces/m.)	F/L: 3 days R: 30 days	----	----	(long life battery) R/C: 6/12 hours 2 times/month	F/L: once/7 days R/C: once/3 days	unsure
		Monthly expenses (SB$/m.)	unsure	----	----	unsure	unsure	unsure
	School	Monthly consumption (pieces/m.)	----	----	----	----	----	----
		Monthly expenses (SB$/m.)	----	----	----	----	----	----
		Who pay	----	----	----	----	----	----
	Church	Monthly consumption (pieces/m.)	----	----	----	----	----	----
		Monthly expenses (SB$/m.)	----	----	----	----	----	----
		Who pay	----	----	----	----	----	----
	Clinic	Monthly consumption (pieces/m.)	----	----	----	---	----	---
		Monthly expenses (SB$/m.)	----	----	----	---	----	---
		Who pay	----	----	----	---	----	---
What kinds of electrical appliances will be required first after electrification			1st: lights (cooking house), 2nd: outlet	1st: lights (center of house), 2nd: outlet	1st: lights (center of house), 3nd: outlet	1st:lights, 2nd:R/C	1st:lights, 2nd:outlet	1st:lights, 2nd:TV

Appendix 7-7-1 Sunshine Duration & Solar Irradiation at Vavaya Ridge Upper Air Observatory in Guadalcanal Island (1/4)

date	Sunshine duration (h/day)	Irradiation energy ($MJ/m^2/day$)	Irradiation energy ($kWh/m^2/day$)	Conversion coefficient (kW/m^2)
1999/12/1	2.7	14.75	4.10	1.52
1999/12/2	4.5	13.65	3.79	0.84
1999/12/3	9.5	22.78	6.33	0.67
1999/12/4	6.3	19.64	5.46	0.87
1999/12/5	6.3	15.88	4.41	0.70
1999/12/6	5.5	16.45	4.57	0.83
1999/12/7	9.0	18.82	5.23	0.58
1999/12/8	9.2	18.00	5.00	0.54
1999/12/9	-	-	-	-
1999/12/10	-	-	-	-
1999/12/11	-	-	-	-
1999/12/12	-	-	-	-
1999/12/13	6.2	13.98	3.88	0.63
1999/12/14	6.0	20.88	5.80	0.97
1999/12/15	-	-	-	-
1999/12/16	-	-	-	-
1999/12/17	1.0	7.16	1.99	1.99
1999/12/18	4.8	17.32	4.81	1.00
1999/12/19	-	-	-	-
1999/12/20	7.3	14.98	4.16	0.57
1999/12/21	5.8	13.99	3.89	0.67
1999/12/22	7.4	16.79	4.66	0.63
1999/12/23	6.1	15.32	4.26	0.70
1999/12/24	6.9	16.74	4.65	0.67
1999/12/25	6.1	16.46	4.57	0.75
1999/12/26	6.0	17.05	4.74	0.79
1999/12/27	9.3	19.46	5.41	0.58
1999/12/28	7.3	18.01	5.00	0.69
1999/12/29	6.9	19.99	5.55	0.80
1999/12/30	9.1	20.72	5.76	0.63
1999/12/31	7.9	22.18	6.16	0.78
Average	6.55	17.13	4.76	0.727

Note - : no data
Source :Data from Vavaya ridge Upper Air Observatory

Appendix 7-7-1 Sunshine Duration & Solar Irradiation at Vavaya Ridge Upper Air Observatory in Guadalcanal Island (2/4)

date	Sunshine duration (h/day)	Irradiation energy ($MJ/m^2/day$)	Irradiation energy ($kWh/m^2/day$)	Conversion coefficient (kW/m^2)
2000/1/1	-	-	-	-
2000/1/2	1.3	10.64	2.96	2.27
2000/1/3	3.3	15.27	4.24	1.29
2000/1/4	0.2	8.12	2.26	11.28
2000/1/5	7.2	18.38	5.11	0.71
2000/1/6	3.9	14.63	4.06	1.04
2000/1/7	6.1	18.04	5.01	0.82
2000/1/8	5.6	15.63	4.34	0.78
2000/1/9	3.6	10.94	3.04	0.84
2000/1/10	4.0	13.07	3.63	0.91
2000/1/11	0.0	5.00	1.39	-
2000/1/12	6.3	16.32	4.53	0.72
2000/1/13	1.1	7.36	2.04	1.86
2000/1/14	4.0	13.12	3.64	0.91
2000/1/15	4.8	17.23	4.79	1.00
2000/1/16	6.7	20.33	5.65	0.84
2000/1/17	7.5	17.83	4.95	0.66
2000/1/18	3.7	16.01	4.45	1.20
2000/1/19	1.2	10.10	2.81	2.34
2000/1/20	7.6	18.95	5.26	0.69
2000/1/21	9.1	17.59	4.89	0.54
2000/1/22	5.5	18.04	5.01	0.91
2000/1/23	1.8	12.32	3.42	1.90
2000/1/24	-	-	-	-
2000/1/25	6.7	16.32	4.53	0.68
2000/1/26	4.7	15.93	4.43	0.94
2000/1/27	6.3	18.30	5.08	0.81
2000/1/28	1.8	12.67	3.52	1.96
2000/1/29	7.2	14.50	4.03	0.56
2000/1/30	7.0	18.94	5.26	0.75
2000/1/31	6.3	17.50	4.86	0.77
Average	4.64	14.80	4.11	0.886

Note - : no data

Source :Data from Vavaya ridge Upper Air Observatory

Appendix 7-7-1 Sunshine Duration & Solar Irradiation at Vavaya Ridge Upper Air Observatory in Guadalcanal Island (3/4)

date	Sunshine duration (h/day)	Irradiation energy ($MJ/m^2/day$)	Irradiation energy ($kWh/m^2/day$)	Conversion coefficient (kW/m^2)
2000/2/1	4.4	16.00	4.44	1.01
2000/2/2	2.3	11.00	3.06	1.33
2000/2/3	3.4	12.63	3.51	1.03
2000/2/4	7.6	19.00	5.28	0.69
2000/2/5	7.3	18.14	5.04	0.69
2000/2/6	5.6	16.18	4.49	0.80
2000/2/7	6.0	15.87	4.41	0.73
2000/2/8	4.2	15.20	4.22	1.01
2000/2/9	9.5	20.07	5.58	0.59
2000/2/10	8.1	20.31	5.64	0.70
2000/2/11	10.0	21.40	5.94	0.59
2000/2/12	9.5	20.02	5.56	0.59
2000/2/13	9.0	19.33	5.37	0.60
2000/2/14	9.8	19.52	5.42	0.55
2000/2/15	8.7	19.87	5.52	0.63
2000/2/16	9.7	20.87	5.80	0.60
2000/2/17	2.8	10.98	3.05	1.09
2000/2/18	3.4	12.67	3.52	1.03
2000/2/19	4.2	13.45	3.74	0.89
2000/2/20	-	-	-	-
2000/2/21	0.9	6.73	1.87	2.08
2000/2/22	5.1	17.26	4.79	0.94
2000/2/23	6.4	17.07	4.74	0.74
2000/2/24	9.7	19.77	5.49	0.57
2000/2/25	2.9	12.77	3.55	1.22
2000/2/26	5.3	12.92	3.59	0.68
2000/2/27	5.8	18.98	5.27	0.91
2000/2/28	3.8	13.65	3.79	1.00
2000/2/29	7.5	17.80	4.94	0.66
Average	6.18	16.97	4.56	0.738

Note - : no data

Source :Data from Vavaya ridge Upper Air Observatory

Appendix 7-7-1 Sunshine Duration & Solar Irradiation at Vavaya Ridge Upper Air Observatory in Guadalcanal Island (4/4)

date	Sunshine duration (h/day)	Irradiation energy ($MJ/m^2/day$)	Irradiation energy ($kWh/m^2/day$)	Conversion coefficient (kW/m^2)
2000/3/1	4.4	16.00	4.44	1.01
2000/3/2	2.3	11.00	3.06	1.33
2000/3/3	3.4	12.63	3.51	1.03
2000/3/4	7.6	19.00	5.28	0.69
2000/3/5	7.3	18.14	5.04	0.69
2000/3/6	5.6	16.18	4.49	0.80
2000/3/7	6.0	15.87	4.41	0.73
2000/3/8	4.2	15.20	4.22	1.01
2000/3/9	9.5	20.07	5.58	0.59
2000/3/10	8.1	20.31	5.64	0.70
2000/3/11	10.0	21.40	5.94	0.59
2000/3/12	9.5	20.02	5.56	0.59
2000/3/13	9.0	19.33	5.37	0.60
2000/3/14	9.8	19.52	5.42	0.55
2000/3/15	8.7	19.87	5.52	0.63
2000/3/16	9.7	20.87	5.80	0.60
2000/3/17	2.8	10.98	3.05	1.09
2000/3/18	3.4	12.67	3.52	1.04
2000/3/19	4.2	13.45	3.74	0.89
2000/3/20	0.0	11.23	3.12	-
2000/3/21	0.9	6.73	1.87	2.08
2000/3/22	5.1	17.26	4.79	0.94
2000/3/23	6.4	17.07	4.74	0.74
2000/3/24	9.7	19.77	5.49	0.57
2000/3/25	2.9	12.77	3.55	1.22
2000/3/26	5.3	12.92	3.59	0.68
2000/3/27	5.8	18.98	5.27	0.91
2000/3/28	3.8	13.65	3.79	1.00
2000/3/29	7.5	17.80	4.94	0.66
2000/3/30	-	-	-	-
2000/3/31	-	-	-	-
Average	5.96	16.23	4.51	0.756

Note - : no data

Source :Data from Vavaya ridge Upper Air Observatory

Appendix 7-8-1 Calculation of PV and battery capacity in Honiara (1/3)

(for a private house)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion factor r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-9.4	56.0	6.0	0.7	15.1	15.33	33.0	15.12	33.4	14.80	34.2	14.36	35.2	14.10	35.8	13.82	36.6	13.17	38.4
Feb.	-12.96	-9.4	56.0	6.0	0.7	15.1	15.14	33.4	15.12	33.4	14.98	33.7	14.73	34.3	14.56	34.7	14.36	35.2	13.89	36.4
Mar.	-1.99	-9.4	56.0	6.3	0.7	15.9	15.64	32.3	15.88	31.8	16.00	31.6	15.99	31.6	15.95	31.7	15.87	31.8	15.62	32.3
Apr.	9.61	-9.4	56.0	6.6	0.7	16.6	16.07	31.4	16.63	30.4	17.07	29.6	17.37	29.1	17.48	28.9	17.55	28.8	17.59	28.7
May	18.73	-9.4	56.0	6.7	0.7	16.9	16.03	31.5	16.88	29.9	17.61	28.7	18.19	27.8	18.44	27.4	18.64	27.1	18.95	26.7
June	23.04	-9.4	56.0	6.9	0.7	17.4	16.36	30.9	17.39	29.1	18.29	27.6	19.04	26.5	19.37	26.1	19.66	25.7	20.12	25.1
July	21.23	-9.4	56.0	6.2	0.7	15.6	14.76	34.2	15.62	32.3	16.37	30.9	16.99	29.7	17.26	29.3	17.49	28.9	17.85	28.3
Aug.	13.80	-9.4	56.0	6.7	0.7	16.9	16.19	31.2	16.88	29.9	17.45	29.0	17.88	28.3	18.05	28.0	18.18	27.8	18.34	27.6
Sept.	3.06	-9.4	56.0	6.6	0.7	16.6	16.25	31.1	16.63	30.4	16.89	29.9	17.02	29.7	17.03	29.7	17.02	29.7	16.89	29.9
Oct.	-8.55	-9.4	56.0	7.2	0.7	18.1	18.05	28.0	18.14	27.9	18.10	27.9	17.92	28.2	17.77	28.4	17.60	28.7	17.14	29.5
Nov.	-18.24	-9.4	56.0	7.6	0.7	19.2	19.34	26.1	19.15	26.4	18.82	26.9	18.34	27.5	18.05	28.0	17.73	28.5	16.98	29.8
Dec.	-22.97	-9.4	56.0	6.6	0.7	16.6	16.92	29.9	16.63	30.4	16.22	31.2	15.68	32.2	15.37	32.9	15.03	33.6	14.26	35.4
Total						200.1	196.07		200.09		202.58		203.53		203.42		202.93		200.79	
Average				6.6		16.7	16.34	31.1	16.67	30.4	16.88	30.1	16.96	30.0	16.95	30.1	16.91	30.2	16.73	30.7
Maximum				7.6		19.2	19.34	34.2	19.15	33.4	18.82	34.2	19.04	35.2	19.37	35.8	19.66	36.6	20.12	38.4
Minimum				6.0		15.1	14.76	26.1	15.12	26.4	14.80	26.9	14.36	26.5	14.10	26.1	13.82	25.7	13.17	25.1

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	1	4	44.0
	FL 9W	9			0.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	2	12.0
Total (Wh/day)		---	---	---	56.0

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
56.0	0.5	5.0	0.9	1.0	52

Appendix 7-8-1 Calculation of PV and battery capacity in Honiara (2/3) (for a private house)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion factor for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-9.40	85.5	6.0	0.7	15.1	15.33	50.3	15.12	51.0	14.80	52.1	14.36	53.7	14.10	54.7	13.82	55.8	13.17	58.6
Feb.	-12.96	-9.40	85.5	6.0	0.7	15.1	15.14	50.9	15.12	51.0	14.98	51.5	14.73	52.4	14.56	53.0	14.36	53.7	13.89	55.6
Mar.	-1.99	-9.40	85.5	6.3	0.7	15.9	15.64	49.3	15.88	48.6	16.00	48.2	15.99	48.2	15.95	48.4	15.87	48.6	15.62	49.4
Apr.	9.61	-9.40	85.5	6.6	0.7	16.6	16.07	48.0	16.63	46.4	17.07	45.2	17.37	44.4	17.48	44.1	17.55	44.0	17.59	43.9
May	18.73	-9.40	85.5	6.7	0.7	16.9	16.03	48.1	16.88	45.7	17.61	43.8	18.19	42.4	18.44	41.8	18.64	41.4	18.95	40.7
June	23.04	-9.40	85.5	6.9	0.7	17.4	16.36	47.2	17.39	44.4	18.29	42.2	19.04	40.5	19.37	39.8	19.66	39.3	20.12	38.3
July	21.23	-9.40	85.5	6.2	0.7	15.6	14.76	52.3	15.62	49.4	16.37	47.1	16.99	45.4	17.26	44.7	17.49	44.1	17.85	43.2
Aug.	13.80	-9.40	85.5	6.7	0.7	16.9	16.19	47.7	16.88	45.7	17.45	44.2	17.88	43.1	18.05	42.7	18.18	42.4	18.34	42.1
Sept.	3.06	-9.40	85.5	6.6	0.7	16.6	16.25	47.5	16.63	46.4	16.89	45.7	17.02	45.3	17.03	45.3	17.02	45.3	16.89	45.7
Oct.	-8.55	-9.40	85.5	7.2	0.7	18.1	18.05	42.7	18.14	42.5	18.10	42.6	17.92	43.1	17.77	43.4	17.60	43.8	17.14	45.0
Nov.	-18.24	-9.40	85.5	7.6	0.7	19.2	19.34	39.9	19.15	40.3	18.82	41.0	18.34	42.1	18.05	42.7	17.73	43.5	16.98	45.4
Dec.	-22.97	-9.40	85.5	6.6	0.7	16.6	16.92	45.6	16.63	46.4	16.22	47.6	15.68	49.2	15.37	50.2	15.03	51.3	14.26	54.1
Total						200.1	196.07		200.09		202.58		203.53		203.42		202.93		200.79	
Average				6.6		16.7	16.34	47.5	16.67	46.5	16.88	45.9	16.96	45.8	16.95	45.9	16.91	46.1	16.73	46.8
Maximum				7.6		19.2	19.34	52.3	19.15	51.0	18.82	52.1	19.04	53.7	19.37	54.7	19.66	55.8	20.12	58.6
Minimum				6.0		15.1	14.76	39.9	15.12	40.3	14.80	41.0	14.36	40.5	14.10	39.8	13.82	39.3	13.17	38.3

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11			0.0
	FL 9W	9			0.0
	FL 7W	7	3	3.5	73.5
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	2	12.0
Total (Wh/day)		---	---	---	85.5

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
85.5	0.5	5.0	0.9	1.0	79

Appendix 7-8-1 Calculation of PV and battery capacity in Honiara (3/3)

(for a public facility)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion factor for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-9.40	116.0	6.0	0.7	15.1	15.33	68.3	15.12	69.2	14.80	70.7	14.36	72.9	14.10	74.2	13.82	75.8	13.17	79.5
Feb.	-12.96	-9.40	116.0	6.0	0.7	15.1	15.14	69.1	15.12	69.2	14.98	69.9	14.73	71.1	14.56	71.9	14.36	72.9	13.89	75.4
Mar.	-1.99	-9.40	116.0	6.3	0.7	15.9	15.64	66.9	15.88	65.9	16.00	65.4	15.99	65.4	15.95	65.6	15.87	66.0	15.62	67.0
Apr.	9.61	-9.40	116.0	6.6	0.7	16.6	16.07	65.1	16.63	62.9	17.07	61.3	17.37	60.2	17.48	59.9	17.55	59.6	17.59	59.5
May	18.73	-9.40	116.0	6.7	0.7	16.9	16.03	65.3	16.88	62.0	17.61	59.5	18.19	57.5	18.44	56.8	18.64	56.1	18.95	55.2
June	23.04	-9.40	116.0	6.9	0.7	17.4	16.36	64.0	17.39	60.2	18.29	57.2	19.04	55.0	19.37	54.0	19.66	53.3	20.12	52.0
July	21.23	-9.40	116.0	6.2	0.7	15.6	14.76	70.9	15.62	67.0	16.37	63.9	16.99	61.6	17.26	60.7	17.49	59.9	17.85	58.7
Aug.	13.80	-9.40	116.0	6.7	0.7	16.9	16.19	64.7	16.88	62.0	17.45	60.0	17.88	58.5	18.05	58.0	18.18	57.6	18.34	57.1
Sept.	3.06	-9.40	116.0	6.6	0.7	16.6	16.25	64.4	16.63	62.9	16.89	62.0	17.02	61.5	17.03	61.5	17.02	61.5	16.89	62.0
Oct.	-8.55	-9.40	116.0	7.2	0.7	18.1	18.05	58.0	18.14	57.7	18.10	57.8	17.92	58.4	17.77	58.9	17.60	59.5	17.14	61.1
Nov.	-18.24	-9.40	116.0	7.6	0.7	19.2	19.34	54.1	19.15	54.7	18.82	55.6	18.34	57.1	18.05	58.0	17.73	59.0	16.98	61.7
Dec.	-22.97	-9.40	116.0	6.6	0.7	16.6	16.92	61.9	16.63	62.9	16.22	64.5	15.68	66.7	15.37	68.1	15.03	69.7	14.26	73.4
Total						200.1	196.07		200.09		202.58		203.53		203.42		202.93		200.79	
Average				6.6		16.7	16.34	64.4	16.67	63.1	16.88	62.3	16.96	62.2	16.95	62.3	16.91	62.6	16.73	63.5
Maximum				7.6		19.2	19.34	70.9	19.15	69.2	18.82	70.7	19.04	72.9	19.37	74.2	19.66	75.8	20.12	79.5
Minimum				6.0		15.1	14.76	54.1	15.12	54.7	14.80	55.6	14.36	55.0	14.10	54.0	13.82	53.3	13.17	52.0

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	4	2.5	110.0
	FL 9W	9			0.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	1	6.0
Total (Wh/day)		---	---	---	116.0

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
116.0	0.5	5.0	0.9	1.0	107

Appendix 7-8-2 Calculation of PV and battery capacity in Munda (1/3)

(for a private house)

Month	solar declination, monthly average (year '99)	latitude		Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-8.3	48.2	5.9	0.7	14.9	15.10	28.8	14.87	29.3	14.52	29.9	14.07	30.9	13.80	31.5	13.51	32.2	12.84	33.9
Feb.	-12.96	-8.3	48.2	5.0	0.7	12.6	12.64	34.4	12.60	34.5	12.46	34.9	12.23	35.6	12.08	36.0	11.90	36.5	11.49	37.9
Mar.	-1.99	-8.3	48.2	5.8	0.7	14.6	14.42	30.2	14.62	29.8	14.70	29.6	14.67	29.6	14.62	29.8	14.54	29.9	14.29	30.4
Apr.	9.61	-8.3	48.2	5.6	0.7	14.1	13.66	31.8	14.11	30.8	14.46	30.1	14.69	29.6	14.76	29.5	14.81	29.4	14.82	29.3
May	18.73	-8.3	48.2	5.5	0.7	13.9	13.19	33.0	13.86	31.4	14.42	30.2	14.88	29.2	15.06	28.9	15.22	28.6	15.44	28.2
June	23.04	-8.3	48.2	5.3	0.7	13.4	12.60	34.5	13.36	32.6	14.01	31.0	14.57	29.9	14.80	29.4	15.01	29.0	15.33	28.4
July	21.23	-8.3	48.2	4.6	0.7	11.6	10.98	39.6	11.59	37.5	12.12	35.9	12.56	34.6	12.74	34.1	12.90	33.7	13.14	33.1
Aug.	13.80	-8.3	48.2	5.4	0.7	13.6	13.07	33.3	13.61	32.0	14.04	31.0	14.36	30.3	14.48	30.0	14.57	29.8	14.68	29.6
Sept.	3.06	-8.3	48.2	5.5	0.7	13.9	13.56	32.1	13.86	31.4	14.05	31.0	14.13	30.8	14.13	30.8	14.11	30.8	13.98	31.1
Oct.	-8.55	-8.3	48.2	5.9	0.7	14.9	14.82	29.4	14.87	29.3	14.81	29.4	14.63	29.7	14.50	30.0	14.34	30.3	13.95	31.2
Nov.	-18.24	-8.3	48.2	6.5	0.7	16.4	16.57	26.3	16.38	26.6	16.07	27.1	15.63	27.8	15.37	28.3	15.08	28.8	14.41	30.2
Dec.	-22.97	-8.3	48.2	6.2	0.7	15.6	15.92	27.3	15.62	27.8	15.21	28.6	14.68	29.6	14.37	30.3	14.03	31.0	13.28	32.7
Total						169.3	166.53		169.34		170.87		171.10		170.72		170.02		167.65	
Average				5.6		14.1	13.88	31.7	14.11	31.1	14.24	30.7	14.26	30.6	14.23	30.7	14.17	30.8	13.97	31.3
Maximum				6.5		16.4	16.57	39.6	16.38	37.5	16.07	35.9	15.63	35.6	15.37	36.0	15.22	36.5	15.44	37.9
Minimum				4.6		11.6	10.98	26.3	11.59	26.6	12.12	27.1	12.23	27.8	12.08	28.3	11.90	28.6	11.49	28.2

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	1	4	44.0
	FL 9W	9			0.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	0.7	4.2
Total (Wh/day)		---	---	---	48.2

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
48.2	0.5	5.0	0.9	1.0	45

Appendix 7-8-2 Calculation of PV and battery capacity in Munda (2/3) (for a private house)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-8.30	73.4	5.9	0.7	14.9	15.10	43.9	14.87	44.5	14.52	45.6	14.07	47.1	13.80	48.0	13.51	49.0	12.84	51.6
Feb.	-12.96	-8.30	73.4	5.0	0.7	12.6	12.64	52.4	12.60	52.6	12.46	53.1	12.23	54.2	12.08	54.8	11.90	55.6	11.49	57.7
Mar.	-1.99	-8.30	73.4	5.8	0.7	14.6	14.42	45.9	14.62	45.3	14.70	45.1	14.67	45.1	14.62	45.3	14.54	45.6	14.29	46.4
Apr.	9.61	-8.30	73.4	5.6	0.7	14.1	13.66	48.5	14.11	46.9	14.46	45.8	14.69	45.1	14.76	44.9	14.81	44.7	14.82	44.7
May	18.73	-8.30	73.4	5.5	0.7	13.9	13.19	50.2	13.86	47.8	14.42	45.9	14.88	44.5	15.06	44.0	15.22	43.5	15.44	42.9
June	23.04	-8.30	73.4	5.3	0.7	13.4	12.60	52.6	13.36	49.6	14.01	47.3	14.57	45.5	14.80	44.8	15.01	44.1	15.33	43.2
July	21.23	-8.30	73.4	4.6	0.7	11.6	10.98	60.3	11.59	57.1	12.12	54.6	12.56	52.7	12.74	52.0	12.90	51.4	13.14	50.4
Aug.	13.80	-8.30	73.4	5.4	0.7	13.6	13.07	50.7	13.61	48.7	14.04	47.2	14.36	46.1	14.48	45.7	14.57	45.4	14.68	45.1
Sept.	3.06	-8.30	73.4	5.5	0.7	13.9	13.56	48.8	13.86	47.8	14.05	47.1	14.13	46.9	14.13	46.9	14.11	46.9	13.98	47.4
Oct.	-8.55	-8.30	73.4	5.9	0.7	14.9	14.82	44.7	14.87	44.5	14.81	44.7	14.63	45.3	14.50	45.7	14.34	46.2	13.95	47.5
Nov.	-18.24	-8.30	73.4	6.5	0.7	16.4	16.57	40.0	16.38	40.4	16.07	41.2	15.63	42.4	15.37	43.1	15.08	43.9	14.41	46.0
Dec.	-22.97	-8.30	73.4	6.2	0.7	15.6	15.92	41.6	15.62	42.4	15.21	43.6	14.68	45.1	14.37	46.1	14.03	47.2	13.28	49.9
Total						169.3	166.53		169.34		170.87		171.10		170.72		170.02		167.65	
Average				5.6		14.1	13.88	48.3	14.11	47.3	14.24	46.8	14.26	46.7	14.23	46.8	14.17	47.0	13.97	47.7
Maximum				6.5		16.4	16.57	60.3	16.38	57.1	16.07	54.6	15.63	54.2	15.37	54.8	15.22	55.6	15.44	57.7
Minimum				4.6		11.6	10.98	40.0	11.59	40.4	12.12	41.2	12.23	42.4	12.08	43.1	11.90	43.5	11.49	42.9

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	1	4	44.0
	FL 9W	9	1	1.5	13.5
	FL 7W	7	1	1.5	10.5
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	0.9	5.4
Total (Wh/day)		---	---	---	73.4

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
73.4	0.5	5.0	0.9	1.0	68

Appendix 7-8-2 Calculation of PV and battery capacity in Munda (3/3)

(for a public facility)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion factor for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-8.30	100.4	5.9	0.7	14.9	15.10	60.0	14.87	60.9	14.52	62.4	14.07	64.4	13.80	65.6	13.51	67.1	12.84	70.5
Feb.	-12.96	-8.30	100.4	5.0	0.7	12.6	12.64	71.7	12.60	71.9	12.46	72.7	12.23	74.1	12.08	75.0	11.90	76.1	11.49	78.8
Mar.	-1.99	-8.30	100.4	5.8	0.7	14.6	14.42	62.8	14.62	62.0	14.70	61.6	14.67	61.7	14.62	62.0	14.54	62.3	14.29	63.4
Apr.	9.61	-8.30	100.4	5.6	0.7	14.1	13.66	66.3	14.11	64.2	14.46	62.7	14.69	61.7	14.76	61.3	14.81	61.2	14.82	61.1
May	18.73	-8.30	100.4	5.5	0.7	13.9	13.19	68.7	13.86	65.4	14.42	62.8	14.88	60.9	15.06	60.1	15.22	59.5	15.44	58.7
June	23.04	-8.30	100.4	5.3	0.7	13.4	12.60	71.9	13.36	67.8	14.01	64.6	14.57	62.2	14.80	61.2	15.01	60.4	15.33	59.1
July	21.23	-8.30	100.4	4.6	0.7	11.6	10.98	82.5	11.59	78.1	12.12	74.7	12.56	72.1	12.74	71.1	12.90	70.2	13.14	68.9
Aug.	13.80	-8.30	100.4	5.4	0.7	13.6	13.07	69.3	13.61	66.6	14.04	64.5	14.36	63.1	14.48	62.5	14.57	62.1	14.68	61.7
Sept.	3.06	-8.30	100.4	5.5	0.7	13.9	13.56	66.8	13.86	65.4	14.05	64.5	14.13	64.1	14.13	64.1	14.11	64.2	13.98	64.8
Oct.	-8.55	-8.30	100.4	5.9	0.7	14.9	14.82	61.1	14.87	60.9	14.81	61.2	14.63	61.9	14.50	62.5	14.34	63.1	13.95	64.9
Nov.	-18.24	-8.30	100.4	6.5	0.7	16.4	16.57	54.7	16.38	55.3	16.07	56.4	15.63	57.9	15.37	58.9	15.08	60.1	14.41	62.9
Dec.	-22.97	-8.30	100.4	6.2	0.7	15.6	15.92	56.9	15.62	58.0	15.21	59.6	14.68	61.7	14.37	63.0	14.03	64.5	13.28	68.2
Total						169.3	166.53		169.34		170.87		171.10		170.72		170.02		167.65	
Average				5.6		14.1	13.88	66.1	14.11	64.7	14.24	64.0	14.26	63.8	14.23	64.0	14.17	64.2	13.97	65.3
Maximum				6.5		16.4	16.57	82.5	16.38	78.1	16.07	74.7	15.63	74.1	15.37	75.0	15.22	76.1	15.44	78.8
Minimum				4.6		11.6	10.98	54.7	11.59	55.3	12.12	56.4	12.23	57.9	12.08	58.9	11.90	59.5	11.49	58.7

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	4	2.25	99.0
	FL 9W	9			0.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	0.23	1.4
Total (Wh/day)		---	---	---	100.4

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
100.4	0.5	5.0	0.9	1.0	93

Appendix 7-8-3 Calculation of PV and battery capacity in Taro (1/3)

(for a private house)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-6.4	42.6	5.9	0.7	14.9	15.14	25.4	14.87	25.9	14.48	26.5	13.98	27.5	13.69	28.1	13.37	28.7	12.67	30.3
Feb.	-12.96	-6.4	42.6	5.6	0.7	14.1	14.20	27.1	14.11	27.2	13.92	27.6	13.62	28.2	13.43	28.6	13.21	29.1	12.71	30.3
Mar.	-1.99	-6.4	42.6	5.7	0.7	14.4	14.21	27.0	14.36	26.8	14.41	26.7	14.34	26.8	14.26	27.0	14.16	27.1	13.88	27.7
Apr.	9.61	-6.4	42.6	5.9	0.7	14.9	14.44	26.6	14.87	25.9	15.18	25.3	15.38	25.0	15.44	24.9	15.47	24.9	15.43	24.9
May	18.73	-6.4	42.6	5.0	0.7	12.6	12.04	31.9	12.60	30.5	13.07	29.4	13.43	28.6	13.58	28.3	13.70	28.1	13.86	27.7
June	23.04	-6.4	42.6	4.9	0.7	12.3	11.69	32.9	12.35	31.1	12.91	29.8	13.37	28.8	13.56	28.3	13.73	28.0	13.99	27.5
July	21.23	-6.4	42.6	3.9	0.7	9.8	9.34	41.1	9.83	39.1	10.24	37.5	10.57	36.4	10.71	35.9	10.82	35.5	10.99	35.0
Aug.	13.80	-6.4	42.6	4.5	0.7	11.3	10.93	35.2	11.34	33.9	11.66	33.0	11.89	32.3	11.97	32.1	12.03	31.9	12.08	31.8
Sept.	3.06	-6.4	42.6	5.3	0.7	13.4	13.11	29.3	13.36	28.8	13.50	28.5	13.54	28.4	13.52	28.4	13.48	28.5	13.31	28.9
Oct.	-8.55	-6.4	42.6	5.5	0.7	13.9	13.85	27.7	13.86	27.7	13.76	27.9	13.56	28.4	13.42	28.6	13.25	29.0	12.85	29.9
Nov.	-18.24	-6.4	42.6	6.4	0.7	16.1	16.36	23.5	16.13	23.8	15.77	24.4	15.30	25.1	15.01	25.6	14.70	26.1	14.00	27.5
Dec.	-22.97	-6.4	42.6	5.9	0.7	14.9	15.20	25.3	14.87	25.9	14.43	26.6	13.87	27.7	13.56	28.4	13.22	29.1	12.46	30.9
Total						162.5	160.52		162.54		163.32		162.85		162.16		161.15		158.22	
Average				5.4		13.5	13.38	29.4	13.55	28.9	13.61	28.6	13.57	28.6	13.51	28.7	13.43	28.8	13.19	29.4
Maximum				6.4		16.1	16.36	41.1	16.13	39.1	15.77	37.5	15.38	36.4	15.44	35.9	15.47	35.5	15.43	35.0
Minimum				3.9		9.8	9.34	23.5	9.83	23.8	10.24	24.4	10.57	25.0	10.71	24.9	10.82	24.9	10.99	24.9

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11			0.0
	FL 9W	9	1	4	36.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	1.1	6.6
Total (Wh/day)		---	---	---	42.6

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
42.6	0.5	5.0	0.9	1.0	39

Appendix 7-8-3 Calculation of PV and battery capacity in Taro (2/3) (for a private house)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-6.40	65.1	5.9	0.7	14.9	15.14	38.8	14.87	39.5	14.48	40.6	13.98	42.0	13.69	42.9	13.37	43.9	12.67	46.4
Feb.	-12.96	-6.40	65.1	5.6	0.7	14.1	14.20	41.4	14.11	41.6	13.92	42.2	13.62	43.1	13.43	43.8	13.21	44.5	12.71	46.2
Mar.	-1.99	-6.40	65.1	5.7	0.7	14.4	14.21	41.3	14.36	40.9	14.41	40.8	14.34	41.0	14.26	41.2	14.16	41.5	13.88	42.3
Apr.	9.61	-6.40	65.1	5.9	0.7	14.9	14.44	40.7	14.87	39.5	15.18	38.7	15.38	38.2	15.44	38.0	15.47	38.0	15.43	38.1
May	18.73	-6.40	65.1	5.0	0.7	12.6	12.04	48.8	12.60	46.6	13.07	45.0	13.43	43.7	13.58	43.3	13.70	42.9	13.86	42.4
June	23.04	-6.40	65.1	4.9	0.7	12.3	11.69	50.2	12.35	47.6	12.91	45.5	13.37	43.9	13.56	43.3	13.73	42.8	13.99	42.0
July	21.23	-6.40	65.1	3.9	0.7	9.8	9.34	62.9	9.83	59.8	10.24	57.4	10.57	55.6	10.71	54.9	10.82	54.3	10.99	53.4
Aug.	13.80	-6.40	65.1	4.5	0.7	11.3	10.93	53.7	11.34	51.8	11.66	50.4	11.89	49.4	11.97	49.1	12.03	48.8	12.08	48.6
Sept.	3.06	-6.40	65.1	5.3	0.7	13.4	13.11	44.8	13.36	44.0	13.50	43.5	13.54	43.4	13.52	43.4	13.48	43.6	13.31	44.1
Oct.	-8.55	-6.40	65.1	5.5	0.7	13.9	13.85	42.4	13.86	42.4	13.76	42.7	13.56	43.3	13.42	43.8	13.25	44.3	12.85	45.7
Nov.	-18.24	-6.40	65.1	6.4	0.7	16.1	16.36	35.9	16.13	36.4	15.77	37.2	15.30	38.4	15.01	39.1	14.70	40.0	14.00	42.0
Dec.	-22.97	-6.40	65.1	5.9	0.7	14.9	15.20	38.7	14.87	39.5	14.43	40.7	13.87	42.3	13.56	43.3	13.22	44.4	12.46	47.2
Total						162.5	160.52		162.54		163.32		162.85		162.16		161.15		158.22	
Average				5.4		13.5	13.38	45.0	13.55	44.1	13.61	43.7	13.57	43.7	13.51	43.8	13.43	44.1	13.19	44.9
Maximum				6.4		16.1	16.36	62.9	16.13	59.8	15.77	57.4	15.38	55.6	15.44	54.9	15.47	54.3	15.43	53.4
Minimum				3.9		9.8	9.34	35.9	9.83	36.4	10.24	37.2	10.57	38.2	10.71	38.0	10.82	38.0	10.99	38.1

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11			0.0
	FL 9W	9			0.0
	FL 7W	7	3	3.1	65.1
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	0	0.0
Total (Wh/day)		---	---	---	65.1

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
65.1	0.5	5.0	0.9	1.0	60

Appendix 7-8-3 Calculation of PV and battery capacity in Taro (3/3)

(for a public facility)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-6.40	89.0	5.9	0.7	14.9	15.14	53.0	14.87	54.0	14.48	55.5	13.98	57.5	13.69	58.7	13.37	60.1	12.67	63.4
Feb.	-12.96	-6.40	89.0	5.6	0.7	14.1	14.20	56.6	14.11	56.9	13.92	57.7	13.62	59.0	13.43	59.8	13.21	60.8	12.71	63.2
Mar.	-1.99	-6.40	89.0	5.7	0.7	14.4	14.21	56.5	14.36	55.9	14.41	55.8	14.34	56.0	14.26	56.3	14.16	56.7	13.88	57.9
Apr.	9.61	-6.40	89.0	5.9	0.7	14.9	14.44	55.6	14.87	54.0	15.18	52.9	15.38	52.2	15.44	52.0	15.47	51.9	15.43	52.1
May	18.73	-6.40	89.0	5.0	0.7	12.6	12.04	66.7	12.60	63.8	13.07	61.5	13.43	59.8	13.58	59.1	13.70	58.6	13.86	58.0
June	23.04	-6.40	89.0	4.9	0.7	12.3	11.69	68.7	12.35	65.1	12.91	62.2	13.37	60.1	13.56	59.2	13.73	58.5	13.99	57.4
July	21.23	-6.40	89.0	3.9	0.7	9.8	9.34	86.0	9.83	81.7	10.24	78.5	10.57	76.0	10.71	75.0	10.82	74.2	10.99	73.1
Aug.	13.80	-6.40	89.0	4.5	0.7	11.3	10.93	73.5	11.34	70.8	11.66	68.9	11.89	67.5	11.97	67.1	12.03	66.8	12.08	66.5
Sept.	3.06	-6.40	89.0	5.3	0.7	13.4	13.11	61.3	13.36	60.1	13.50	59.5	13.54	59.3	13.52	59.4	13.48	59.6	13.31	60.3
Oct.	-8.55	-6.40	89.0	5.5	0.7	13.9	13.85	58.0	13.86	58.0	13.76	58.4	13.56	59.2	13.42	59.9	13.25	60.6	12.85	62.5
Nov.	-18.24	-6.40	89.0	6.4	0.7	16.1	16.36	49.1	16.13	49.8	15.77	50.9	15.30	52.5	15.01	53.5	14.70	54.6	14.00	57.4
Dec.	-22.97	-6.40	89.0	5.9	0.7	14.9	15.20	52.9	14.87	54.0	14.43	55.7	13.87	57.9	13.56	59.2	13.22	60.8	12.46	64.5
Total						162.5	160.52		162.54		163.32		162.85		162.16		161.15		158.22	
Average				5.4		13.5	13.38	61.5	13.55	60.4	13.61	59.8	13.57	59.8	13.51	59.9	13.43	60.3	13.19	61.4
Maximum				6.4		16.1	16.36	86.0	16.13	81.7	15.77	78.5	15.38	76.0	15.44	75.0	15.47	74.2	15.43	73.1
Minimum				3.9		9.8	9.34	49.1	9.83	49.8	10.24	50.9	10.57	52.2	10.71	52.0	10.82	51.9	10.99	52.1

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	4	2	88.0
	FL 9W	9			0.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	0.17	1.0
Total (Wh/day)		---	---	---	89.0

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
89.0	0.5	5.0	0.9	1.0	82

Appendix 7-8-4 Calculation of PV and battery capacity in Lata (1/3)

(for a private house)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-10.7	51.8	5.6	0.7	14.1	14.28	32.7	14.11	33.1	13.84	33.8	13.46	34.7	13.23	35.3	12.98	36.0	12.40	37.7
Feb.	-12.96	-10.7	51.8	5.4	0.7	13.6	13.60	34.4	13.61	34.3	13.51	34.6	13.31	35.1	13.17	35.5	13.01	35.9	12.60	37.1
Mar.	-1.99	-10.7	51.8	5.1	0.7	12.9	12.63	37.0	12.85	36.4	12.97	36.0	13.00	36.0	12.97	36.0	12.92	36.2	12.75	36.7
Apr.	9.61	-10.7	51.8	5.8	0.7	14.6	14.09	33.2	14.62	32.0	15.03	31.1	15.33	30.5	15.44	30.3	15.52	30.1	15.58	30.0
May	18.73	-10.7	51.8	5.0	0.7	12.6	11.93	39.2	12.60	37.1	13.17	35.5	13.64	34.3	13.84	33.8	14.01	33.4	14.27	32.8
June	23.04	-10.7	51.8	5.3	0.7	13.4	12.53	37.3	13.36	35.0	14.08	33.2	14.70	31.8	14.97	31.2	15.21	30.7	15.60	30.0
July	21.23	-10.7	51.8	5.4	0.7	13.6	12.82	36.5	13.61	34.3	14.30	32.7	14.87	31.4	15.12	30.9	15.34	30.5	15.69	29.8
Aug.	13.80	-10.7	51.8	5.3	0.7	13.4	12.77	36.6	13.36	35.0	13.84	33.8	14.21	32.9	14.36	32.6	14.48	32.3	14.63	31.9
Sept.	3.06	-10.7	51.8	5.3	0.7	13.4	13.02	35.9	13.36	35.0	13.59	34.4	13.72	34.1	13.75	34.0	13.75	34.0	13.67	34.2
Oct.	-8.55	-10.7	51.8	6.0	0.7	15.1	15.01	31.1	15.12	30.9	15.11	30.9	14.99	31.2	14.88	31.4	14.75	31.7	14.40	32.5
Nov.	-18.24	-10.7	51.8	6.4	0.7	16.1	16.25	28.8	16.13	29.0	15.88	29.4	15.51	30.1	15.28	30.6	15.03	31.1	14.43	32.4
Dec.	-22.97	-10.7	51.8	5.7	0.7	14.4	14.58	32.1	14.36	32.5	14.04	33.3	13.60	34.4	13.35	35.0	13.07	35.8	12.43	37.6
Total						167.1	163.52		167.08		169.36		170.36		170.37		170.05		168.46	
Average				5.5		320.04	13.63	34.6	13.92	33.7	14.11	33.2	14.20	33.0	14.20	33.0	14.17	33.1	14.04	33.5
Maximum				6.4		16.1	16.25	39.2	16.13	37.1	15.88	36.0	15.51	36.0	15.44	36.0	15.52	36.2	15.69	37.7
Minimum				5.0		12.6	11.93	28.8	12.60	29.0	12.97	29.4	13.00	30.1	12.97	30.3	12.92	30.1	12.40	29.8

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	1	4	44.0
	FL 9W	9			0.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	1.3	7.8
Total (Wh/day)		---	---	---	51.8

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
51.8	0.5	5.0	0.9	1.0	48

Appendix 7-8-4 Calculation of PV and battery capacity in Lata (2/3) (for a private house)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-10.70	79.0	5.6	0.7	14.1	14.28	49.9	14.11	50.5	13.84	51.5	13.46	53.0	13.23	53.9	12.98	54.9	12.40	57.5
Feb.	-12.96	-10.70	79.0	5.4	0.7	13.6	13.60	52.4	13.61	52.4	13.51	52.8	13.31	53.6	13.17	54.1	13.01	54.8	12.60	56.6
Mar.	-1.99	-10.70	79.0	5.1	0.7	12.9	12.63	56.4	12.85	55.5	12.97	55.0	13.00	54.9	12.97	55.0	12.92	55.2	12.75	55.9
Apr.	9.61	-10.70	79.0	5.8	0.7	14.6	14.09	50.6	14.62	48.8	15.03	47.4	15.33	46.5	15.44	46.2	15.52	45.9	15.58	45.8
May	18.73	-10.70	79.0	5.0	0.7	12.6	11.93	59.8	12.60	56.6	13.17	54.1	13.64	52.3	13.84	51.5	14.01	50.9	14.27	50.0
June	23.04	-10.70	79.0	5.3	0.7	13.4	12.53	56.9	13.36	53.4	14.08	50.6	14.70	48.5	14.97	47.6	15.21	46.9	15.60	45.7
July	21.23	-10.70	79.0	5.4	0.7	13.6	12.82	55.6	13.61	52.4	14.30	49.9	14.87	47.9	15.12	47.2	15.34	46.5	15.69	45.5
Aug.	13.80	-10.70	79.0	5.3	0.7	13.4	12.77	55.8	13.36	53.4	13.84	51.5	14.21	50.2	14.36	49.7	14.48	49.3	14.63	48.7
Sept.	3.06	-10.70	79.0	5.3	0.7	13.4	13.02	54.8	13.36	53.4	13.59	52.5	13.72	52.0	13.75	51.9	13.75	51.9	13.67	52.2
Oct.	-8.55	-10.70	79.0	6.0	0.7	15.1	15.01	47.5	15.12	47.2	15.11	47.2	14.99	47.6	14.88	47.9	14.75	48.3	14.40	49.5
Nov.	-18.24	-10.70	79.0	6.4	0.7	16.1	16.25	43.9	16.13	44.2	15.88	44.9	15.51	46.0	15.28	46.7	15.03	47.5	14.43	49.4
Dec.	-22.97	-10.70	79.0	5.7	0.7	14.4	14.58	48.9	14.36	49.6	14.04	50.8	13.60	52.4	13.35	53.4	13.07	54.6	12.43	57.4
Total						167.1	163.52		167.08		169.36		170.36		170.37		170.05		168.46	
Average				5.5		13.9	13.63	52.7	13.92	51.4	14.11	50.7	14.20	50.4	14.20	50.4	14.17	50.6	14.04	51.2
Maximum				6.4		16.1	16.25	59.8	16.13	56.6	15.88	55.0	15.51	54.9	15.44	55.0	15.52	55.2	15.69	57.5
Minimum				5.0		12.6	11.93	43.9	12.60	44.2	12.97	44.9	13.00	46.0	12.97	46.2	12.92	45.9	12.40	45.5

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	1	4	44.0
	FL 9W	9	1	2	18.0
	FL 7W	7	1	1	7.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	1.67	10.0
Total (Wh/day)		---	---	---	79.0

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
79.0	0.5	5.0	0.9	1.0	73

Appendix 7-8-4 Calculation of PV and battery capacity in Lata (3/3)

(for a public facility)

Month	solar declination, monthly average (year '99)	latitude	Power demand	Average sunshine hours	Conversion facto r for equivalent sunshine hour	Solar irradiation on horizontal plane	tilt angle, -5		tilt angle, 0		tilt angle, 5		tilt angle, 10		tilt angle, 12.5		tilt angle, 15		tilt angle, 20	
							Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand	Solar irradiation on tilt plane	PV capacity to meet demand
	degree	degree	Wh/day	hour/day	kW/m^2	MJ/m^2/day	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp	MJ/m^2/day	Wp
Jan.	-20.79	-10.70	107.8	5.6	0.7	14.1	14.28	68.1	14.11	68.9	13.84	70.3	13.46	72.2	13.23	73.5	12.98	74.9	12.40	78.4
Feb.	-12.96	-10.70	107.8	5.4	0.7	13.6	13.60	71.5	13.61	71.5	13.51	72.0	13.31	73.1	13.17	73.8	13.01	74.8	12.60	77.2
Mar.	-1.99	-10.70	107.8	5.1	0.7	12.9	12.63	77.0	12.85	75.7	12.97	74.9	13.00	74.8	12.97	75.0	12.92	75.2	12.75	76.3
Apr.	9.61	-10.70	107.8	5.8	0.7	14.6	14.09	69.0	14.62	66.5	15.03	64.7	15.33	63.4	15.44	63.0	15.52	62.7	15.58	62.4
May	18.73	-10.70	107.8	5.0	0.7	12.6	11.93	81.5	12.60	77.2	13.17	73.8	13.64	71.3	13.84	70.3	14.01	69.4	14.27	68.1
June	23.04	-10.70	107.8	5.3	0.7	13.4	12.53	77.6	13.36	72.8	14.08	69.0	14.70	66.1	14.97	65.0	15.21	63.9	15.60	62.3
July	21.23	-10.70	107.8	5.4	0.7	13.6	12.82	75.9	13.61	71.5	14.30	68.0	14.87	65.4	15.12	64.3	15.34	63.4	15.69	62.0
Aug.	13.80	-10.70	107.8	5.3	0.7	13.4	12.77	76.1	13.36	72.8	13.84	70.3	14.21	68.4	14.36	67.7	14.48	67.2	14.63	66.5
Sept.	3.06	-10.70	107.8	5.3	0.7	13.4	13.02	74.7	13.36	72.8	13.59	71.6	13.72	70.9	13.75	70.7	13.75	70.7	13.67	71.1
Oct.	-8.55	-10.70	107.8	6.0	0.7	15.1	15.01	64.8	15.12	64.3	15.11	64.3	14.99	64.9	14.88	65.3	14.75	65.9	14.40	67.5
Nov.	-18.24	-10.70	107.8	6.4	0.7	16.1	16.25	59.8	16.13	60.3	15.88	61.2	15.51	62.7	15.28	63.6	15.03	64.7	14.43	67.4
Dec.	-22.97	-10.70	107.8	5.7	0.7	14.4	14.58	66.7	14.36	67.7	14.04	69.3	13.60	71.5	13.35	72.9	13.07	74.4	12.43	78.2
Total						167.1	163.52		167.08		169.36		170.36		170.37		170.05		168.46	
Average				5.5		13.9	13.63	71.9	13.92	70.2	14.11	69.1	14.20	68.7	14.20	68.8	14.17	68.9	14.04	69.8
Maximum				6.4		16.1	16.25	81.5	16.13	77.2	15.88	74.9	15.51	74.8	15.44	75.0	15.52	75.2	15.69	78.4
Minimum				5.0		12.6	11.93	59.8	12.60	60.3	12.97	61.2	13.00	62.7	12.97	63.0	12.92	62.7	12.40	62.0

(Coefficient for PV panel)

As	1.00	Design flexibility
K1	0.83	Coefficient of temperature, '=1-0.0042*(65-25)、supposing that operation temperature of cells is 65 degrees.
K2	0.99	Coefficient of the panel surface dirt
K3	0.80	Efficiency of charge and discharge
K4	0.91	Coefficient of the DC circuit loss 5%, C/C loss 4%
K5	1.00	If inverter installed, efficiency of the inverter would be considered
K6	0.80	Coefficient of difference between maximum power point and actual operation point
K7	0.95	Coefficient of the dispersion of the solar radiation quantity
K8	0.95	Coefficient of the condition around PV panel
K9	0.97	Coefficient due to the difference from designed tilt angle and orientation for PV panel
K10	0.95	Coefficient due to lost performance with age
K0	0.399	K0=As*K1*K2*K3*K4*K5*K6*K7*K8*K9*K10

Applicable appliances and their energy consumption

Appliances		Power Consumption (W)	The number	Lighting Hour (h/day)	Energy Consumption (Wh/day)
Fluorescent lamp *	FL 11W	11	4	2.34	103.0
	FL 9W	9			0.0
	FL 7W	7			0.0
TV(B&W14)	12V 12W	12			0.0
Radio Cassette	12V 6W	6	1	0.8	4.8
Total (Wh/day)		---	---	---	107.8

*Note: If inverter is installed, efficiency of inverter should be included in power consumption.

Battery Capacity (Ah)

Energy Consumption (Wh/day)	depth of discharge	Consecutive non-sunshine day	Maintenance factor	Efficient of inverter	**Capacity**
107.8	0.5	5.0	0.9	1.0	100

Appendix 7-8-5 Calculation of available demand on PV panel, available consecutive non-sunshine day & its recovery day on battery in Honiara

Month	Solar irradiation on PV (tilt angle 12.5 deg)	Available demand(Wh/day) & Charging current(Ah/day)						Available consecutive non-sunshine day & Recovery day					
		36 Wp system		55 Wp system		75 Wp system		56.5 Ah Battery (36Wp system)		80 Ah Battery (55Wp system)		108 Ah Battery (75Wp system)	
	$MJ/m^2/day$	Wh/day	Ah/day	Wh/day	Ah/day	Wh/day	Ah/day	non-sushine	recovery	non-sushine	recovery	non-sushine	recovery
Jan.	14.10	56.3	5.49	86.0	8.40	117.2	11.45	6.0	5.1	5.6	4.8	5.5	4.7
Feb.	14.56	58.1	5.67	88.7	8.67	121.0	11.82	5.8	5.0	5.4	4.6	5.4	4.6
Mar.	15.95	63.6	6.21	97.2	9.49	132.5	12.94	5.3	4.5	4.9	4.2	4.9	4.2
Apr.	17.48	69.7	6.81	106.5	10.40	145.3	14.19	4.9	4.1	4.5	3.8	4.5	3.8
May	18.44	73.6	7.18	112.4	10.98	153.2	14.97	4.6	3.9	4.3	3.6	4.2	3.6
June	19.37	77.3	7.55	118.0	11.53	161.0	15.72	4.4	3.7	4.1	3.5	4.0	3.4
July	17.26	68.8	6.72	105.2	10.27	143.4	14.01	4.9	4.2	4.6	3.9	4.5	3.9
Aug.	18.05	72.0	7.03	110.0	10.75	150.0	14.65	4.7	4.0	4.4	3.7	4.3	3.7
Sept.	17.03	68.0	6.64	103.8	10.14	141.6	13.83	5.0	4.3	4.6	3.9	4.6	3.9
Oct.	17.77	70.9	6.92	108.3	10.58	147.7	14.43	4.8	4.1	4.4	3.8	4.4	3.7
Nov.	18.05	72.0	7.03	110.0	10.75	150.1	14.66	4.7	4.0	4.4	3.7	4.3	3.7
Dec.	15.37	61.3	5.99	93.7	9.15	127.7	12.48	5.5	4.7	5.1	4.4	5.1	4.3
Average	16.95	67.6	6.61	103.3	10.09	140.9	13.76	5.1	4.3	4.7	4.0	4.6	4.0
Maximum	19.37	77.3	7.55	118.0	11.53	161.0	15.72	6.0	5.1	5.6	4.8	5.5	4.7
Minimum	14.10	56.3	5.49	86.0	8.40	117.2	11.45	4.4	3.7	4.1	3.5	4.0	3.4

Appendix7-8-6 Calculation of available demand on PV panel, available consecutive non-sunshine day & its recovery day on battery in Munda

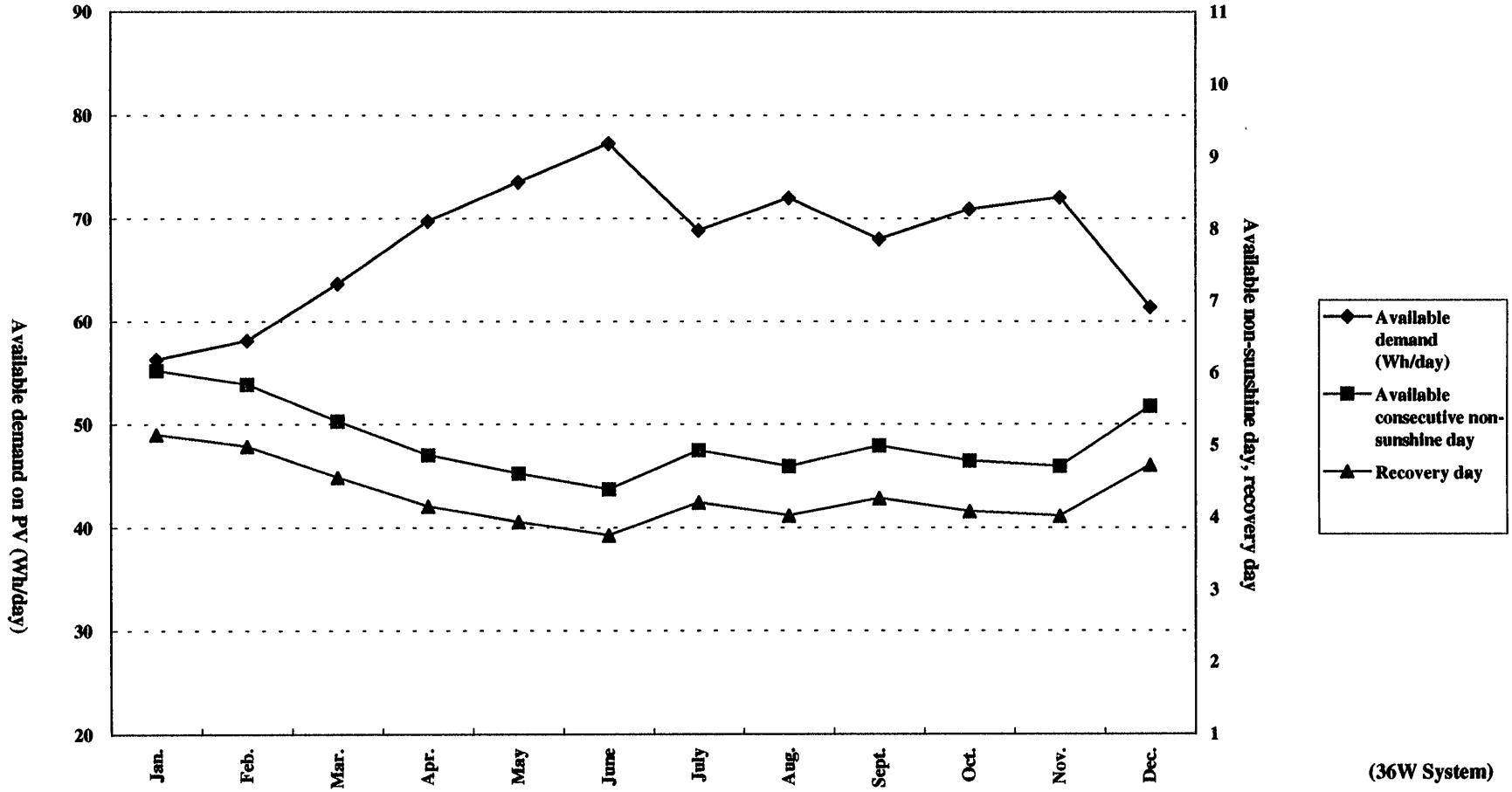
Month	Solar irradiation on PV (tilt angle 12.5 deg)	Available demand(Wh/day) & Charging current(Ah/day)						Available consecutive non-sunshine day & Recovery day					
		36 Wp system		55 Wp system		75 Wp system		56.5 Ah Battery (36Wp system)		80 Ah Battery (55Wp system)		108 Ah Battery (75Wp system)	
	$MJ/m^2/day$	Wh/day	Ah/day	Wh/day	Ah/day	Wh/day	Ah/day	non-sushine	recovery	non-sushine	recovery	non-sushine	recovery
Jan.	13.80	55.1	5.38	84.1	8.22	114.7	11.20	6.2	5.3	5.7	4.9	5.6	4.8
Feb.	12.08	48.2	4.71	73.6	7.19	100.4	9.81	7.0	6.0	6.5	5.6	6.5	5.5
Mar.	14.62	58.3	5.70	89.1	8.70	121.5	11.87	5.8	5.0	5.4	4.6	5.3	4.6
Apr.	14.76	58.9	5.75	90.0	8.79	122.7	11.99	5.8	4.9	5.3	4.6	5.3	4.5
May	15.06	60.1	5.87	91.8	8.97	125.2	12.23	5.6	4.8	5.2	4.5	5.2	4.4
June	14.80	59.0	5.77	90.2	8.81	123.0	12.01	5.7	4.9	5.3	4.5	5.3	4.5
July	12.74	50.8	4.96	77.6	7.58	105.9	10.34	6.7	5.7	6.2	5.3	6.1	5.2
Aug.	14.48	57.8	5.64	88.3	8.62	120.4	11.76	5.9	5.0	5.4	4.6	5.4	4.6
Sept.	14.13	56.4	5.51	86.1	8.41	117.5	11.47	6.0	5.1	5.6	4.8	5.5	4.7
Oct.	14.50	57.9	5.65	88.4	8.63	120.5	11.77	5.9	5.0	5.4	4.6	5.4	4.6
Nov.	15.37	61.3	5.99	93.7	9.15	127.8	12.48	5.5	4.7	5.1	4.4	5.1	4.3
Dec.	14.37	57.3	5.60	87.6	8.55	119.4	11.66	5.9	5.0	5.5	4.7	5.4	4.6
Average	14.23	56.8	5.54	86.7	8.47	118.2	11.55	6.0	5.1	5.6	4.7	5.5	4.7
Maximum	15.37	61.3	5.99	93.7	9.15	127.8	12.48	7.0	6.0	6.5	5.6	6.5	5.5
Minimum	12.08	48.2	4.71	73.6	7.19	100.4	9.81	5.5	4.7	5.1	4.4	5.1	4.3

Appendix 7-8-7 Calculation of available demand on PV panel, available consecutive non-sunshine day & its recovery day on battery in Taro

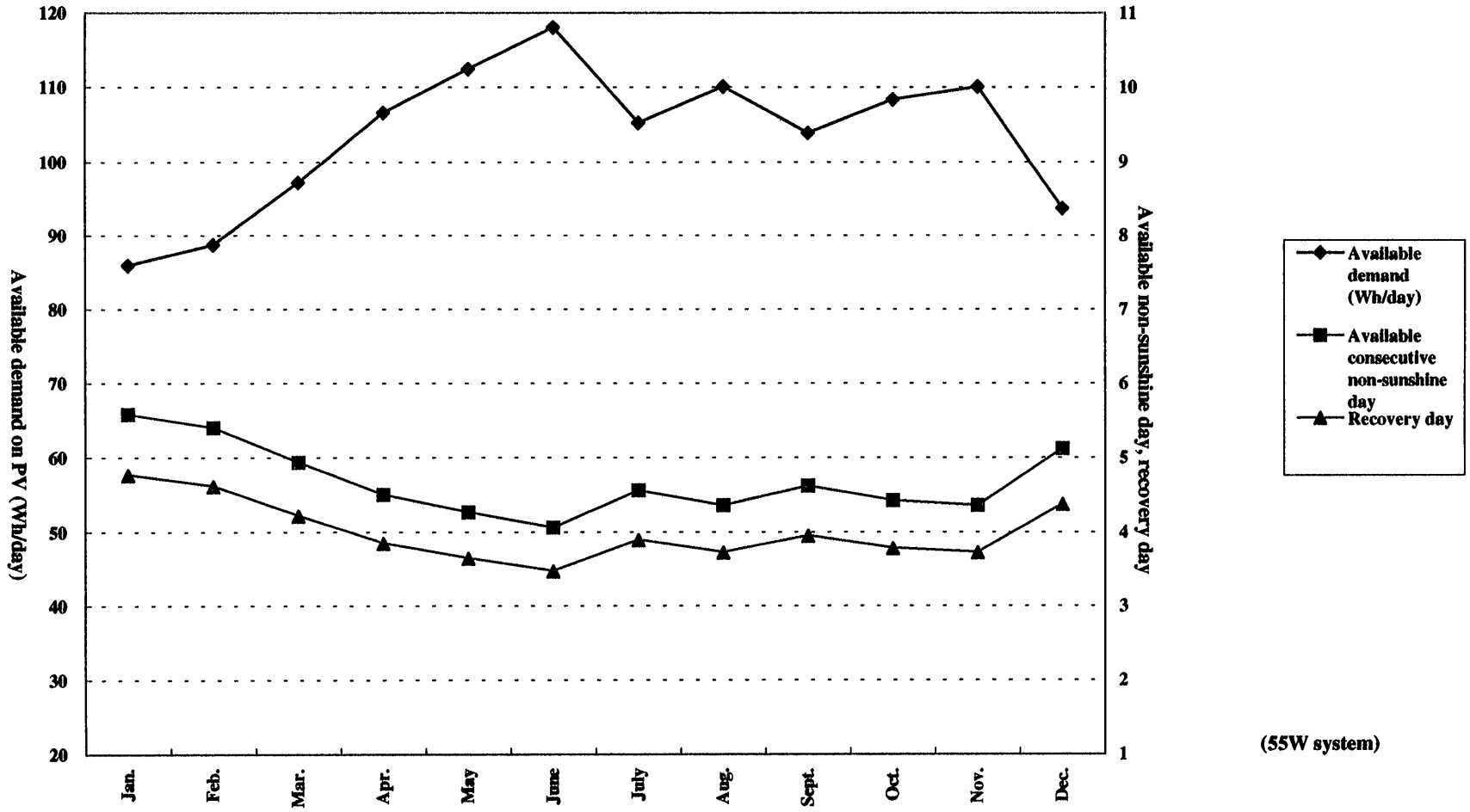
Month	Solar irradiation on PV (tilt angle 12.5 deg)	Available demand(Wh/day) & Charging current(Ah/day)						Available consecutive non-sunshine day & Recovery day					
		36 Wp system		55 Wp system		75 Wp system		56.5 Ah Battery (36Wp system)		80 Ah Battery (55Wp system)		108 Ah Battery (75Wp system)	
	$MJ/m^2/day$	Wh/day	Ah/day	Wh/day	Ah/day	Wh/day	Ah/day	non-sushine	recovery	non-sushine	recovery	non-sushine	recovery
Jan.	13.69	54.6	5.33	83.4	8.15	113.8	11.11	6.2	5.3	5.8	4.9	5.7	4.9
Feb.	13.43	53.6	5.23	81.8	7.99	111.6	10.90	6.3	5.4	5.9	5.0	5.8	5.0
Mar.	14.26	56.9	5.56	86.9	8.49	118.5	11.58	6.0	5.1	5.5	4.7	5.5	4.7
Apr.	15.44	61.6	6.02	94.1	9.19	128.3	12.53	5.5	4.7	5.1	4.4	5.0	4.3
May	13.58	54.2	5.29	82.8	8.08	112.9	11.02	6.3	5.3	5.8	4.9	5.7	4.9
June	13.56	54.1	5.29	82.7	8.07	112.7	11.01	6.3	5.3	5.8	5.0	5.7	4.9
July	10.71	42.7	4.17	65.3	6.37	89.0	8.69	7.9	6.8	7.4	6.3	7.3	6.2
Aug.	11.97	47.8	4.67	73.0	7.13	99.5	9.72	7.1	6.1	6.6	5.6	6.5	5.6
Sept.	13.52	53.9	5.27	82.4	8.05	112.4	10.98	6.3	5.4	5.8	5.0	5.8	4.9
Oct.	13.42	53.5	5.23	81.8	7.99	111.5	10.89	6.3	5.4	5.9	5.0	5.8	5.0
Nov.	15.01	59.9	5.85	91.5	8.94	124.8	12.19	5.7	4.8	5.2	4.5	5.2	4.4
Dec.	13.56	54.1	5.28	82.6	8.07	112.7	11.01	6.3	5.3	5.8	5.0	5.8	4.9
Average	13.51	53.9	5.27	82.4	8.04	112.3	10.97	6.3	5.4	5.9	5.0	5.8	5.0
Maximum	15.44	61.6	6.02	94.1	9.19	128.3	12.53	7.9	6.8	7.4	6.3	7.3	6.2
Minimum	10.71	42.7	4.17	65.3	6.37	89.0	8.69	5.5	4.7	5.1	4.4	5.0	4.3

Appendix 7-8-8 Calculation of available demand on PV panel, available consecutive non-sunshine day & its recovery day on battery in Lata

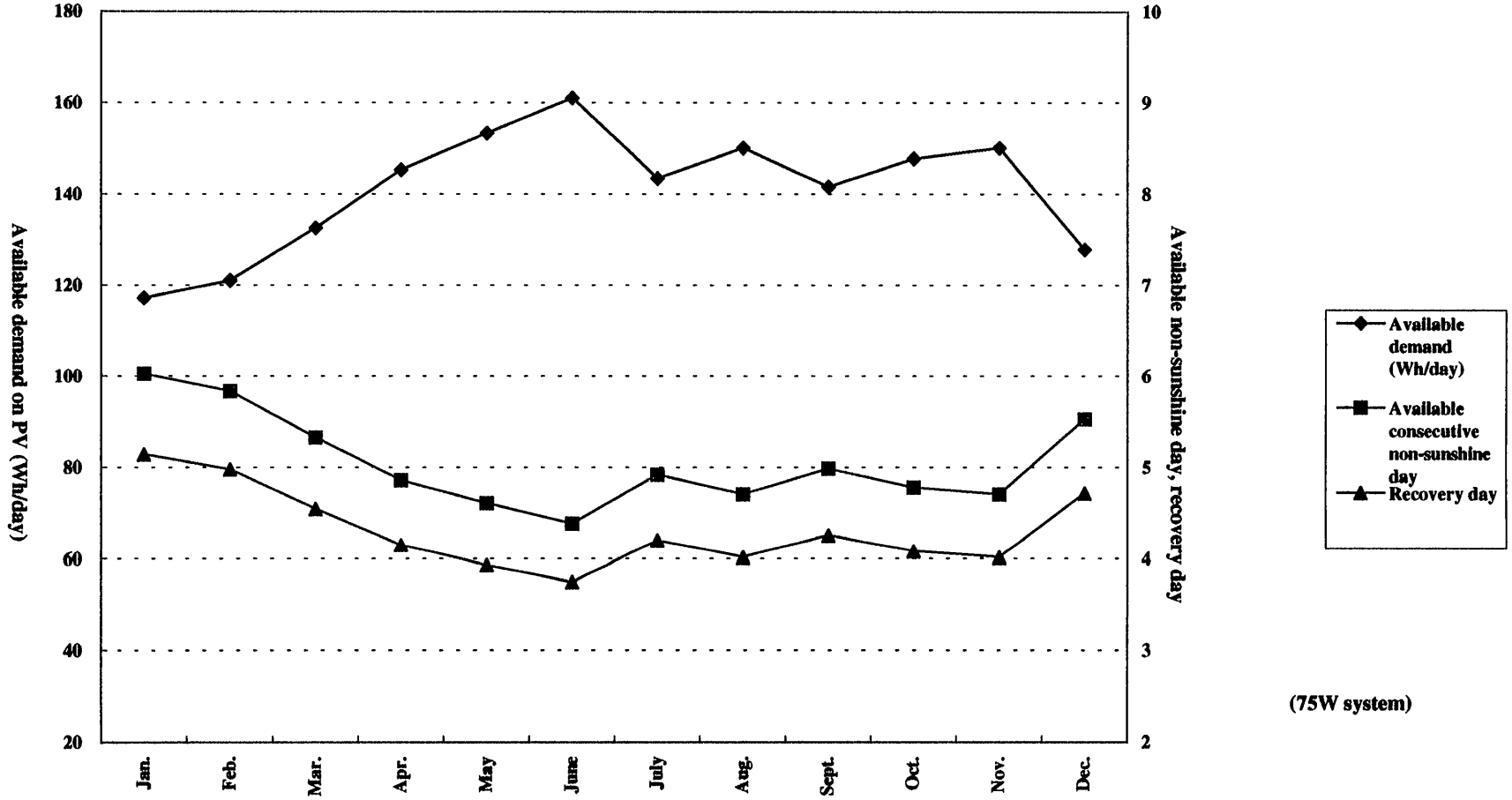
Month	Solar irradiation on PV (tilt angle 12.5 deg)	Available demand(Wh/day) & Charging current(Ah/day)						Available consecutive non-sunshine day & Recovery day					
		36 Wp system		55 Wp system		75 Wp system		56.5 Ah Battery (36Wp system)		80 Ah Battery (55Wp system)		108 Ah Battery (75Wp system)	
	$MJ/m^2/day$	Wh/day	Ah/day	Wh/day	Ah/day	Wh/day	Ah/day	non-sushine	recovery	non-sushine	recovery	non-sushine	recovery
Jan.	13.23	52.8	5.16	80.7	7.88	110.0	10.74	6.4	5.5	6.0	5.1	5.9	5.0
Feb.	13.17	52.5	5.13	80.3	7.84	109.5	10.69	6.5	5.5	6.0	5.1	5.9	5.1
Mar.	12.97	51.8	5.06	79.1	7.72	107.8	10.53	6.5	5.6	6.1	5.2	6.0	5.1
Apr.	15.44	61.6	6.02	94.1	9.19	128.3	12.53	5.5	4.7	5.1	4.4	5.0	4.3
May	13.84	55.2	5.39	84.4	8.24	115.0	11.23	6.1	5.2	5.7	4.9	5.6	4.8
June	14.97	59.7	5.83	91.2	8.91	124.4	12.15	5.7	4.8	5.3	4.5	5.2	4.4
July	15.12	60.3	5.89	92.2	9.00	125.7	12.27	5.6	4.8	5.2	4.4	5.2	4.4
Aug.	14.36	57.3	5.59	87.5	8.55	119.3	11.65	5.9	5.0	5.5	4.7	5.4	4.6
Sept.	13.75	54.8	5.36	83.8	8.18	114.3	11.16	6.2	5.3	5.7	4.9	5.7	4.8
Oct.	14.88	59.4	5.80	90.7	8.86	123.7	12.08	5.7	4.9	5.3	4.5	5.2	4.5
Nov.	15.28	61.0	5.96	93.2	9.10	127.0	12.41	5.6	4.7	5.2	4.4	5.1	4.4
Dec.	13.35	53.2	5.20	81.4	7.95	110.9	10.84	6.4	5.4	5.9	5.0	5.8	5.0
Average	14.20	56.6	5.53	86.5	8.45	118.0	11.52	6.0	5.1	5.6	4.8	5.5	4.7
Maximum	15.44	61.6	6.02	94.1	9.19	128.3	12.53	6.5	5.6	6.1	5.2	6.0	5.1
Minimum	12.97	51.8	5.06	79.1	7.72	107.8	10.53	5.5	4.7	5.1	4.4	5.0	4.3



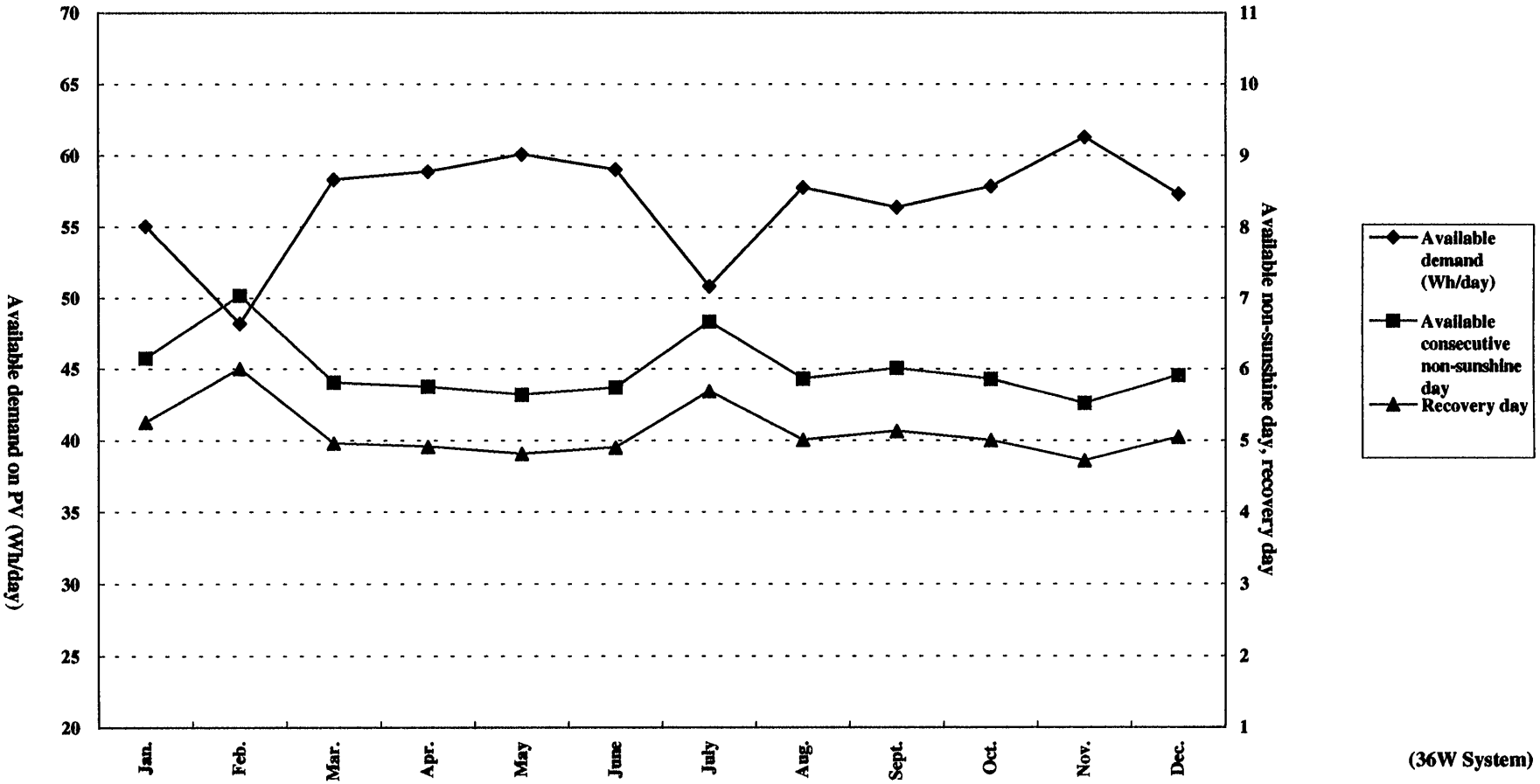
Appendix. 7-8-9 Available demand on PV, available non-sunshine day and recovery day on battery in Honiara (1/3)



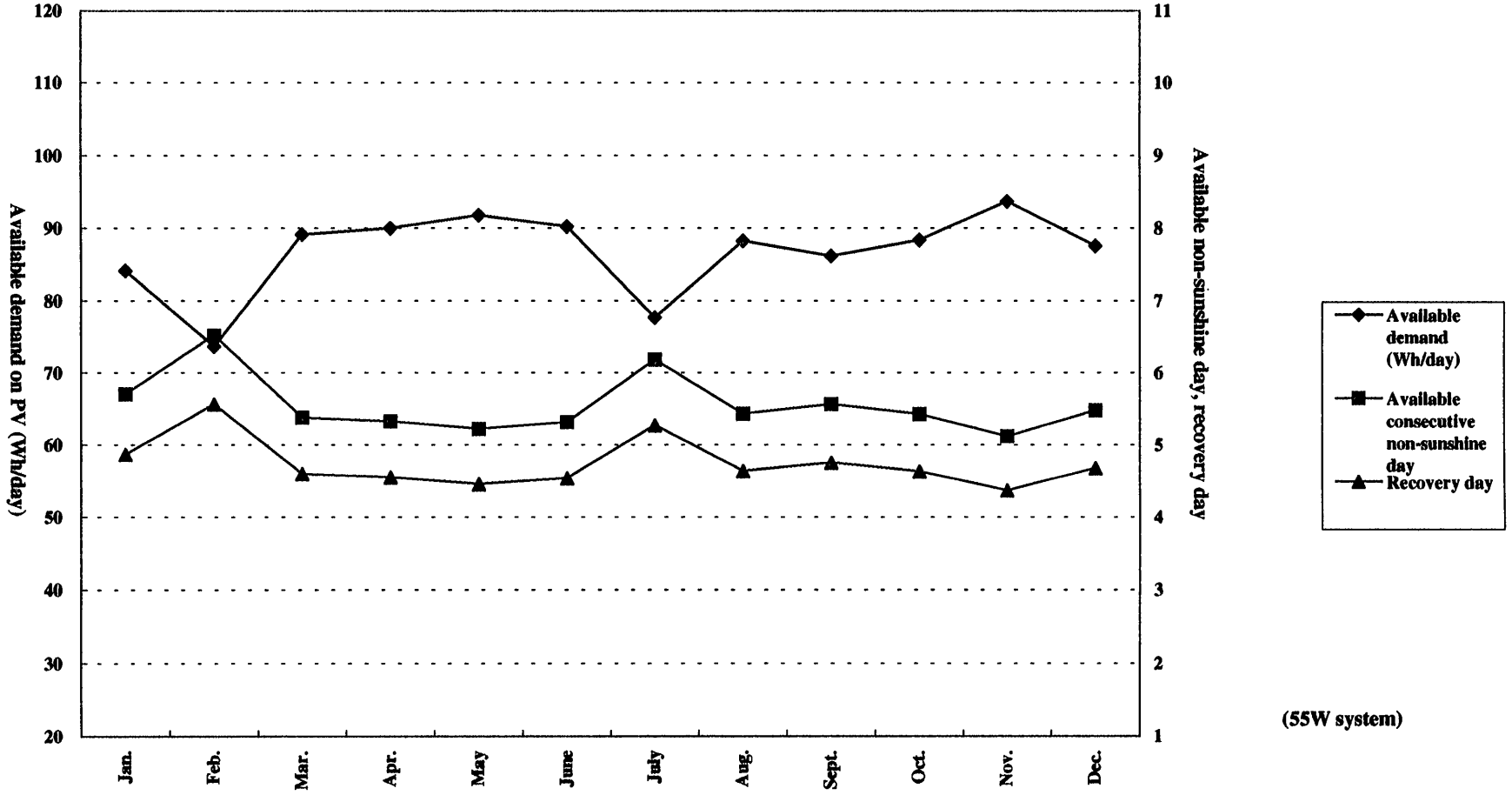
Appendix. 7-8-9 Available demand on PV, available non-sunshine day and recovery day on battery in Honiara (2/3)



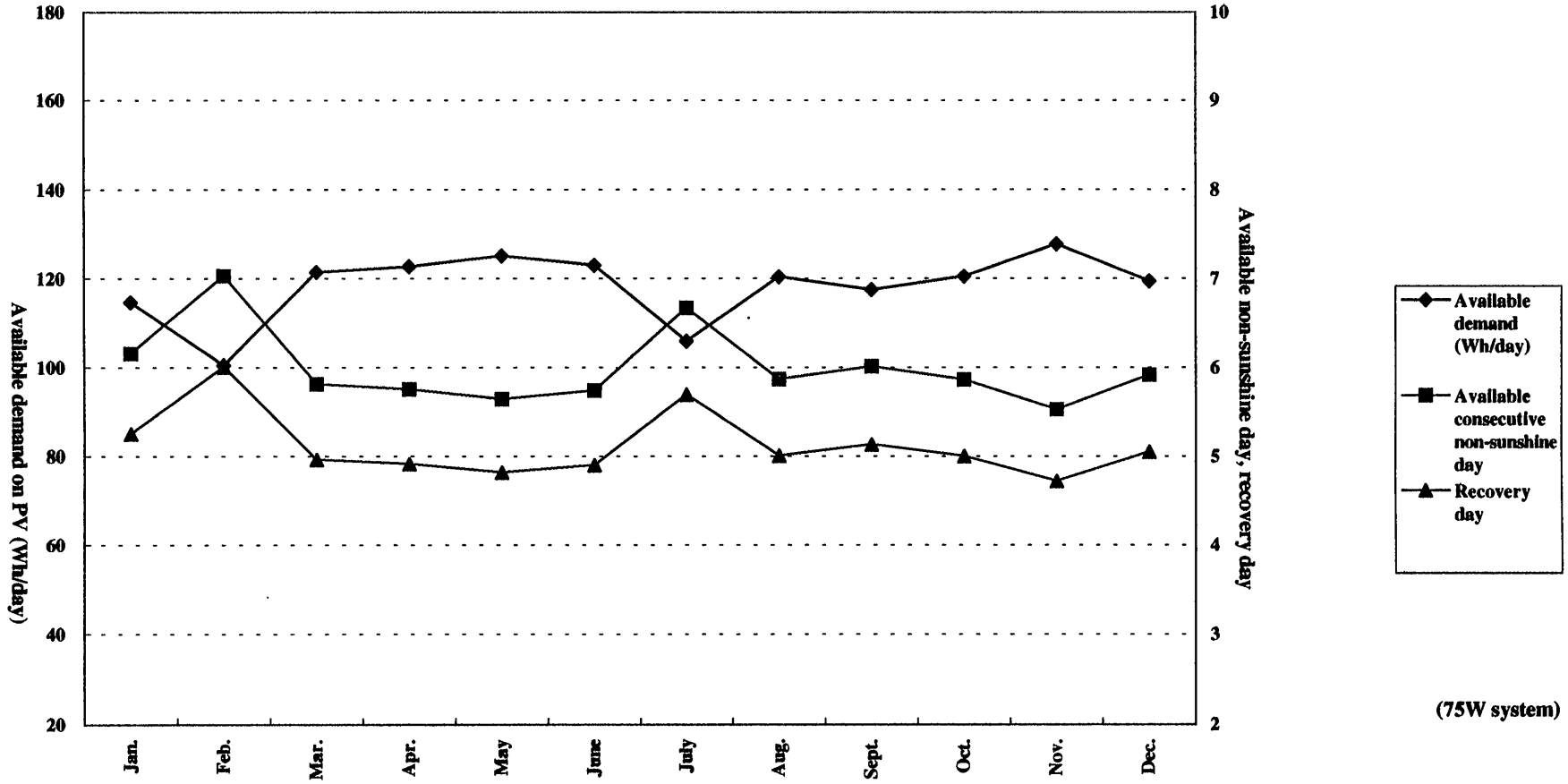
Appendix 7-8-9 Available demand on PV, available non-sunshine day and recovery day on battery in Honiara (3/3)



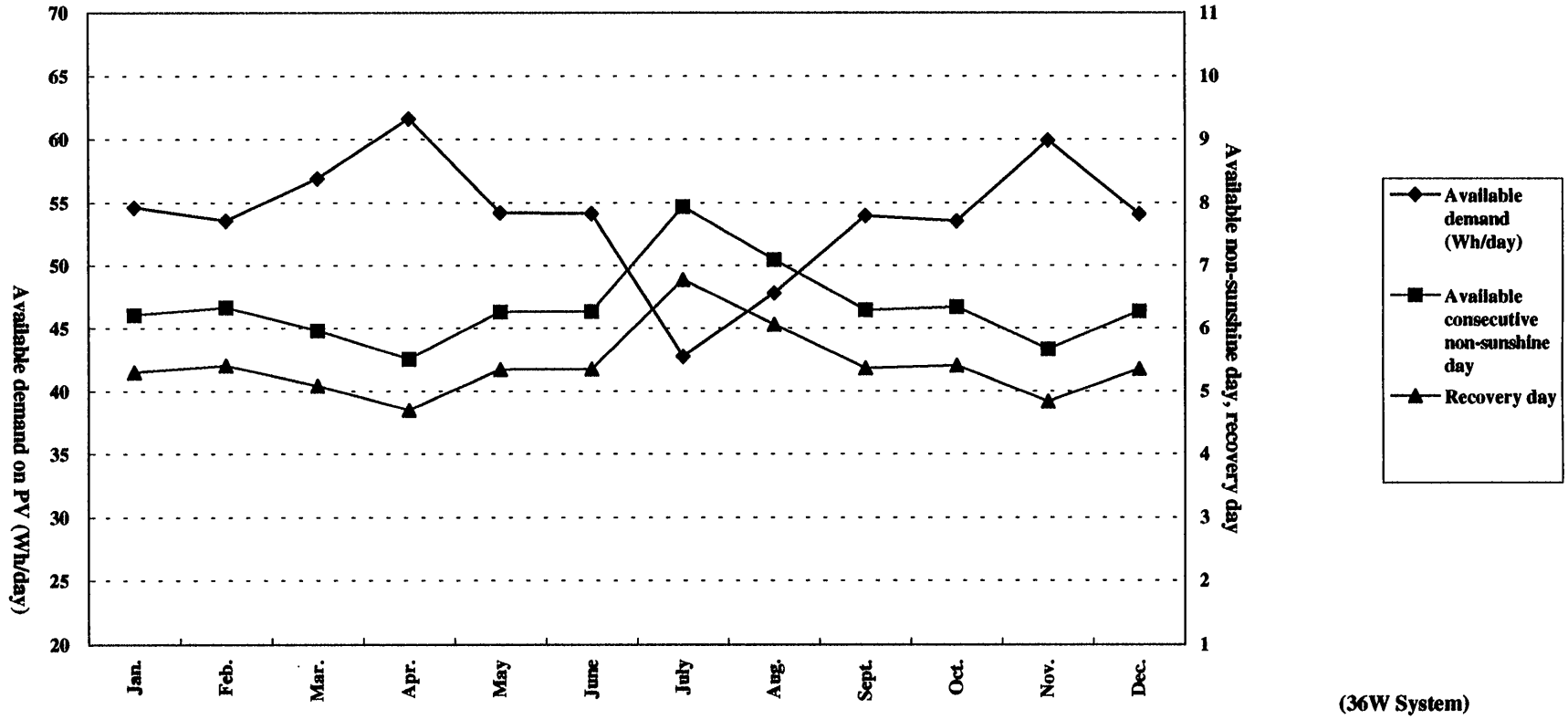
Appendix 7-8-10 Available demand on PV, available non-sunshine day and recovery day on battery in Munda (1/3)



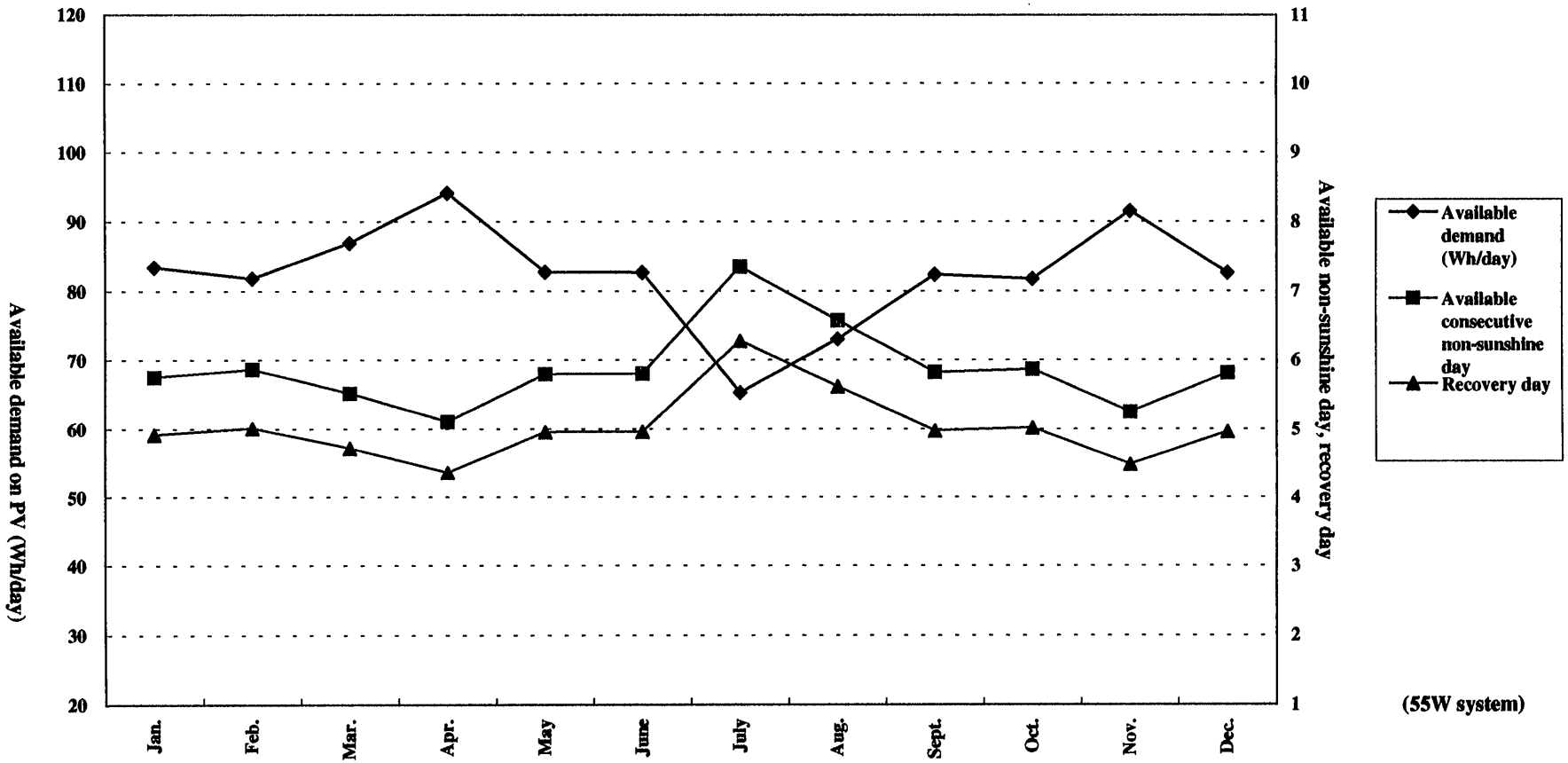
Appendix 7-8-10 Available demand on PV, available non-sunshine day and recovery day on battery in Munda (2/3)



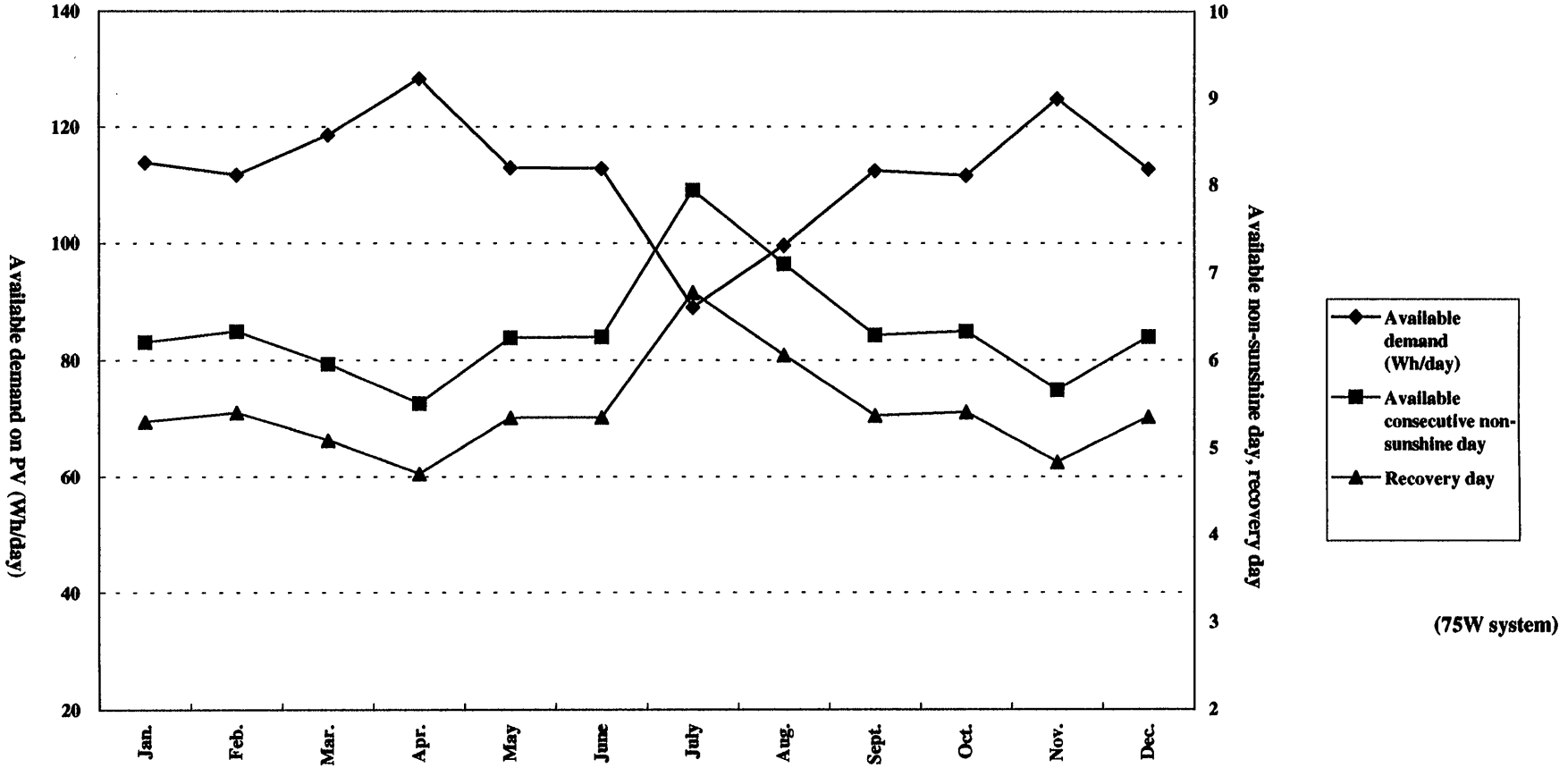
Appendix 7-8-10 Available demand on PV, available non-sunshine day and recovery day on battery in munda (3/3)



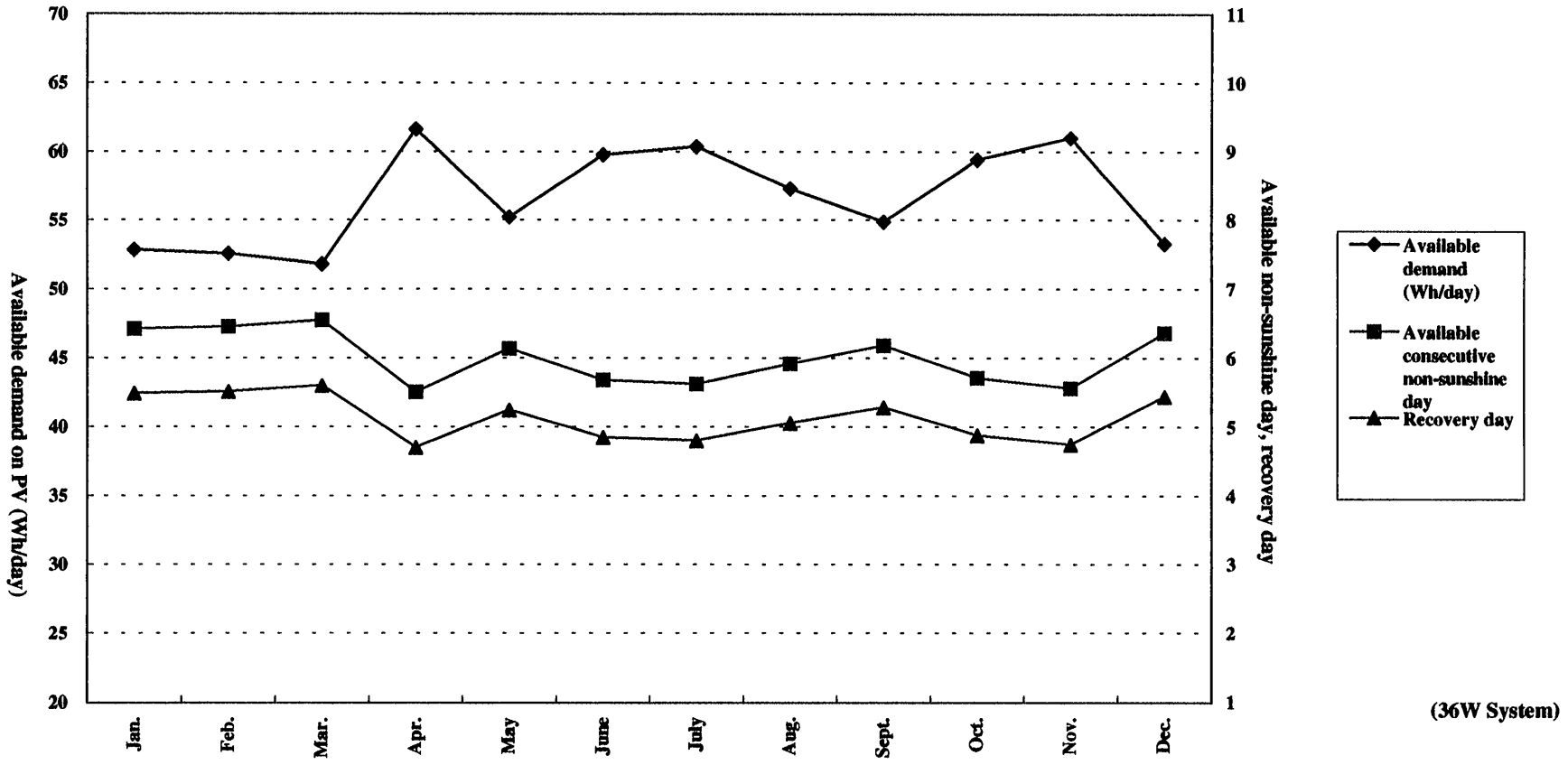
Appendix 7-8-11 Available demand on PV, available non-sunshine day and recovery day on battery in Taro (1/3)



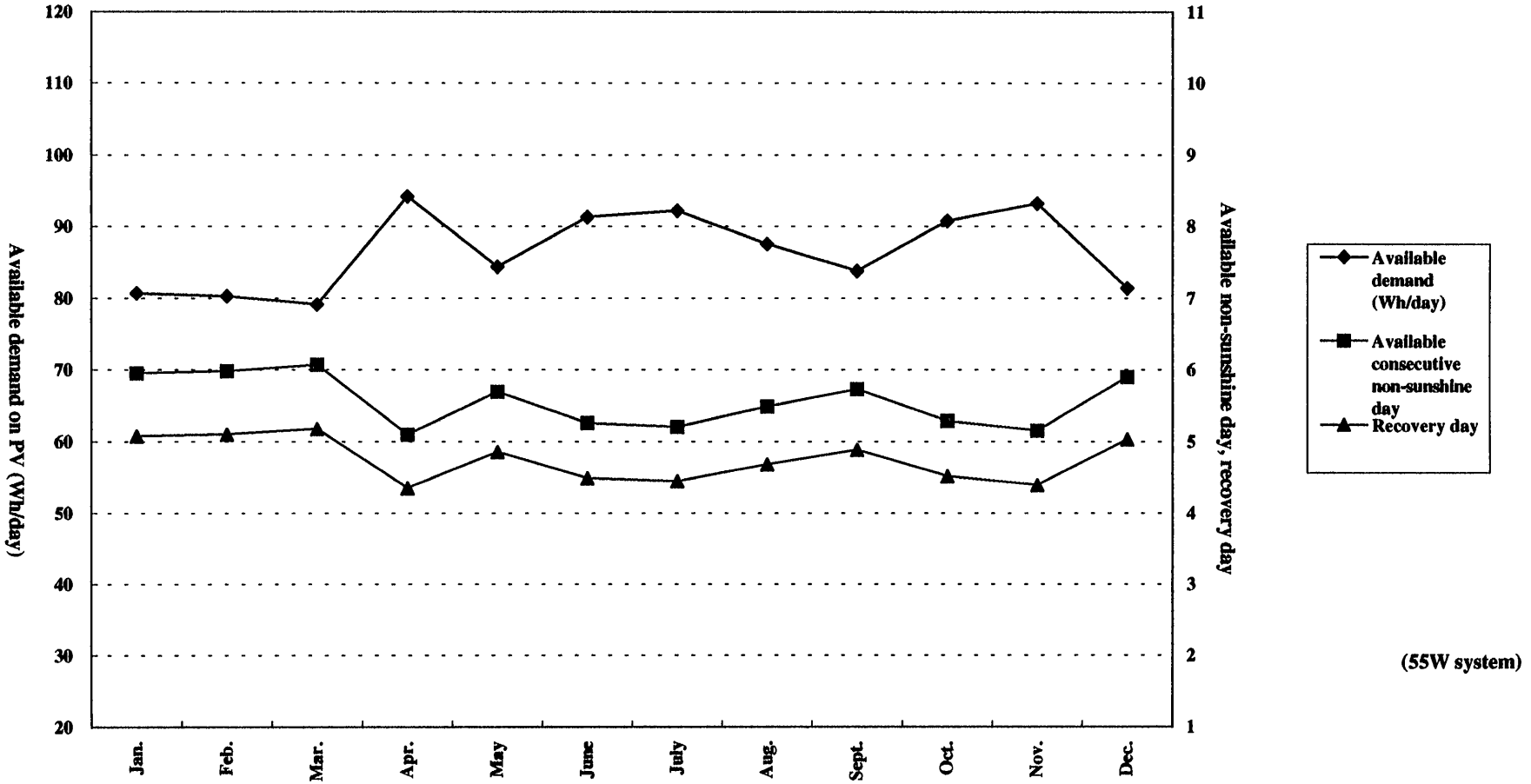
Appendix 7-8-11 Available demand on PV, available non-sunshine day and recovery day on battery in Taro (2/3)



Appendix 7-8-11 Available demand on PV, available non-sunshine day and recovery day on battery in Taro (3/3)

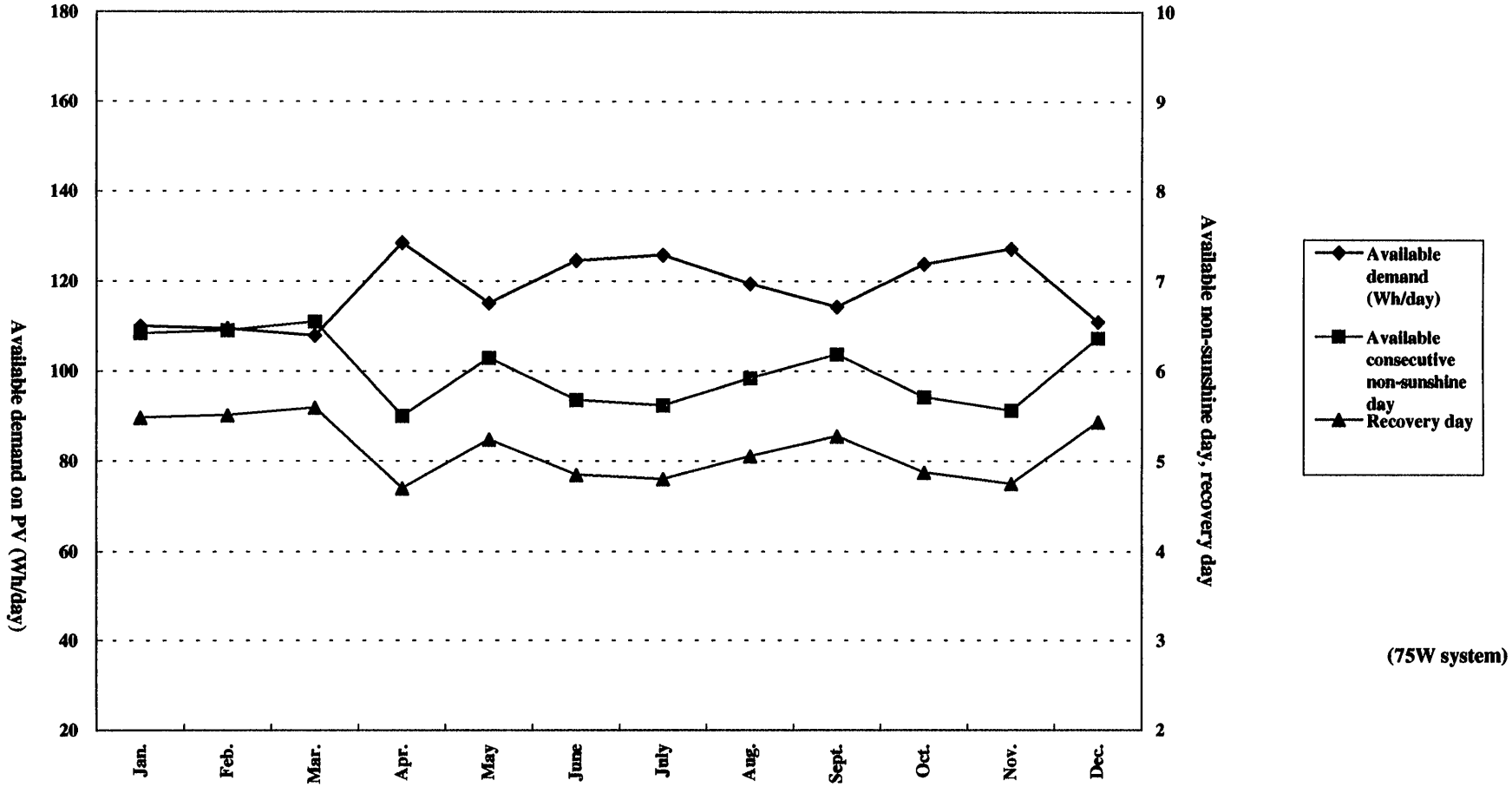


Appendix 7-8-12 Available demand on PV, available non-sunshine day and recovery day on battery in Lata (1/3)



(55W system)

Appendix 7-8-12 Available demand on PV, available non-sunshine day and recovery day on battery in Lata (2/3)



Appendix 7-8-12 Available demand on PV, available non-sunshine day and recovery day on battery in Lata (3/3)

Appendix 7-10-1(1) Expenses for the SHS (36Wp: with tax and others)

Item	Description	Price (US$)	Life span
PV panel	36Wp Siemens SP36 (Mono,17V,2.1A)	368	20
Battery*	12V,56.5Ah(100h):Federal 8G22NF (Sealed Gel Type, deep cycle)	248	7
Charge controller	SunLight-10(PV:10A,Load:10A) Semiconductor type, Protect O/C, O/DC	144	10
Fitting & Accessories	power point, switches, wire cables and others	122	
Wooden box	Container for Battery	19	
Installation fittings	Pole & others	204	
Transport costs	Average in whole country	20	
Construction costs		70	
Total		1,195	With tax, duty and benefit for agency

Note: import duty = CIF*1.3*0.05, duty surcharge = import duty*0.05, goods tax = CIF*1.3*0.15, benefit for agency = CIF*0.15
*Battry cost includes disposal cost (US$4/unit)

Appendix 7-10-1(2) Expenses for the SHS (36Wp: without tax and duty)

Item	Description	Price (US$)	Life span
PV panel	36Wp Siemens SP36 (Mono,17V,2.1A)	300	20
Battery	12V,56.5Ah(100h):Federal 8G22NF (Sealed Gel Type, deep cycle)	202	7
Charge controller	SunLight-10(PV:10A,Load:10A) Semiconductor type, Protect O/C, O/DC	117	10
Fitting & Accessories	power point, switches, wire cables and others	100	
Wooden box	Container for Battery	19	
Installation fittings	Pole & others	168	
Transport costs	Average in whole country	20	
Construction costs		70	
Total		996	Without tax and duty

Note: benefit for agency = CIF*0.15
*Battry cost includes disposal cost (US$4/unit)

Appendix 7-10-2(1) Expenses for the SHS (55Wp: with tax and others)

Item	Description	Price (US$)	Life span
PV panel	55Wp Siemens SM55 (Mono,17.4V,3.15A)	486	20
Battery*	12V,56.5Ah(100h):Federal 8G24 (Sealed Gel Type, deep cycle)	290	7
Charge controller	SunLight-10(PV:10A,Load:10A) Semiconductor type, Protect O/C, O/DC	144	10
Fitting & Accessories	power point, switches, wire cables and others	165	
Wooden box	Container for Battery	19	
Installation fittings	Pole & others	204	
Transport costs	Average in whole country	20	
Construction costs		70	
Total		1,398	With tax, duty and benefit for agency

Note: import duty = CIF*1.3*0.05, duty surcharge = import duty*0.05, goods tax = CIF*1.3*0.15, benefit for agency = CIF*0.15
*Battry cost includes disposal cost (US$4/unit)

Appendix 7-10-2(2) Expenses for the SHS (55Wp: without tax and duty)

Item	Description	Price (US$)	Life span
PV panel	55Wp Siemens SM55 (Mono,17.4V,3.15A)	395	20
Battery*	12V,80Ah(100h):Federal 8G24 (Sealed Gel Type, deep cycle)	237	7
Charge controller	SunLight-10(PV:10A,Load:10A) Semiconductor type, Protect O/C, O/DC	117	10
Fitting & Accessories	power point, switches, wire cables and others	134	
Wooden box	Container for Battery	19	
Installation fittings	Pole & others	168	
Transport costs	Average in whole country	20	
Construction costs		70	
Total		1,160	Without tax and duty

Note: benefit for agency = CIF*0.15
*Battry cost includes disposal cost (US$4/unit)

Appendix 7-10-3(1) Expenses for the SHS (75Wp: with tax and others)

Item	Description	Price (US$)	Life span
PV panel	75Wp Siemens SP75 (Mono,17V,4.4A)	627	20
Battery*	12V,108Ah(100h):Federal 8G310T (Sealed Gel Type, deep cycle)	364	7
Charge controller	SunLight-10(PV:10A,Load:10A) Semiconductor type, Protect O/C, O/DC	144	10
Fitting & Accessories	power point, switches, wire cables and others	204	
Wooden box	Container for Battery	19	
Installation fittings	Pole & others	192	
Transport costs	Average in whole country	20	
Construction costs		70	
Total		1,640	With tax, duty and benefit for agency

Note: import duty = CIF*1.3*0.05, duty surcharge = import duty*0.05, goods tax = CIF*1.3*0.15, benefit for agency = CIF*0.15
*Battry cost includes disposal cost (US$4/unit)

Appendix 7-10-3(2) Expenses for the SHS (75Wp: without tax and duty)

Item	Description	Price (US$)	Life span
PV panel	75Wp Siemens SP75 (Mono,17V,4.4A)	510	20
Battery*	12V,108Ah(100h):Federal 8G310T (Sealed Gel Type, deep cycle)	297	7
Charge controller	SunLight-10(PV:10A,Load:10A) Semiconductor type, Protect O/C, O/DC	117	10
Fitting & Accessories	power point, switches, wire cables and others	100	
Wooden box	Container for Battery	19	
Installation fittings	Pole & others	168	
Transport costs	Average in whole country	20	
Construction costs		70	
Total		1,301	Without tax and duty

Note: benefit for agency = CIF*0.15
*Battry cost includes disposal cost (US$4/unit)

Appendix 7-11-1(1) Calculation of annual expenses for the SHS (36Wp: with tax and others)

(UNIT:US$)

Payment term (year)	20	15	10	7	5	3	0	20	15	10	7	5	3	0
Discount rate (= r)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Interest charged (= i)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Capital Recovery Factor CRF =i / (1 - (1 + i)^(-n))	0.074	0.090	0.123	0.167	0.225	0.360		0.050	0.067	0.100	0.143	0.200	0.333	
Initial cost (A)	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195
Down payment (B)	30	30	30	30	30	30		30	30	30	30	30	30	
Present value of replaced battery (two unit) (C)*	332	332	332	332	332	332	332	332	332	332	332	332	332	332
Present value of replaced charge controller (D)*	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Present value of O&M cost (E) *	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Total Present value (F)= (A)-(B)+(C)+(D)+(E)	1757	1757	1757	1757	1757	1757	1787	1757	1757	1757	1757	1757	1757	1787
Total annual expenses (G)=(F)*CRF	129	158	217	293	395	633		88	117	176	251	351	586	
Total monthly expenses (US$) (G)/12	**10.8**	**13.2**	**18.0**	**24.4**	**32.9**	**52.7**		**7.3**	**9.8**	**14.6**	**20.9**	**29.3**	**48.8**	
Total monthly expenses (SB$)	**53.9**	**65.8**	**90.2**	**121.9**	**164.4**	**263.7**		**36.6**	**48.8**	**73.2**	**104.6**	**146.4**	**244.0**	

Note: excluding fluorescent light

Appendix 7-11-1(2) Calculation of annual expenses for the SHS (36Wp: without tax and duty)

(UNIT:US$)

Payment term (year)	20	15	10	7	5	3	0	20	15	10	7	5	3	0
Discount rate (= r)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Interest charged (= i)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Capital Recovery Factor CRF =i / (1 - (1 + i)^(-n))	0.074	0.090	0.123	0.167	0.225	0.360		0.050	0.067	0.100	0.143	0.200	0.333	
Initial cost (A)	996	996	996	996	996	996	996	996	996	996	996	996	996	996
Down payment (B)	30	30	30	30	30	30		30	30	30	30	30	30	
Present value of replaced battery (two unit) (C)*	270	270	270	270	270	270	270	270	270	270	270	270	270	270
Present value of replaced charge controller (D)*	79	79	79	79	79	79	79	79	79	79	79	79	79	79
Present value of O&M cost (E) *	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Total Present value (F)= (A)-(B)+(C)+(D)+(E)	1478	1478	1478	1478	1478	1478	1508	1478	1478	1478	1478	1478	1478	1508
Total annual expenses (G)=(F)*CRF	109	133	182	246	332	533		74	99	148	211	296	493	
Total monthly expenses (US$) (G)/12	**9.1**	**11.1**	**15.2**	**20.5**	**27.7**	**44.4**		**6.2**	**8.2**	**12.3**	**17.6**	**24.6**	**41.0**	
Total monthly expenses (SB$)	**45.3**	**55.4**	**75.9**	**102.6**	**138.3**	**221.9**		**30.8**	**41.0**	**61.6**	**88.0**	**123.1**	**205.2**	

Note: excluding fluorescent light

(C) = battery/(1+r)^7+battery/(1+r)^14

(D) = charge controller/(1+r)^10

(E) = $\sum_{n=1}^{20} \frac{O\ \&\ M}{(1+r)^n}$, O&M cost = US$12.0/year

Appendix 7-11-2(1) Calculation of annual expenses for the SHS (55Wp: with tax and others)

(UNIT:US$)

Payment term (year)	20	15	10	7	5	3	0	20	15	10	7	5	3	0
Discount rate (= r)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Interest charged (= i)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Capital Recovery Factor CRF =i / (1 - (1 + i)^(-n))	0.074	0.090	0.123	0.167	0.225	0.360		0.050	0.067	0.100	0.143	0.200	0.333	
Initial cost (A)	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398	1398
Down payment (B)	30	30	30	30	30	30		30	30	30	30	30	30	
Present value of replaced battery (two unit) (C)*	388	388	388	388	388	388	388	388	388	388	388	388	388	388
Present value of replaced charge controller (D)*	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Present value of O&M cost (E) *	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Total Present value (F)= (A)-(B)+(C)+(D)+(E)	2016	2016	2016	2016	2016	2016	2046	2016	2016	2016	2016	2016	2016	2046
Total annual expenses (G)=(F)*CRF	148	181	249	336	453	726		101	134	202	288	403	672	
Total monthly expenses (US$) (G)/12	**12.4**	**15.1**	**20.7**	**28.0**	**37.7**	**60.5**		**8.4**	**11.2**	**16.8**	**24.0**	**33.6**	**56.0**	
Total monthly expenses (SB$)	**61.8**	**75.5**	**103.5**	**139.9**	**188.7**	**302.6**		**42.0**	**56.0**	**84.0**	**120.0**	**168.0**	**280.0**	

Note: excluding fluorescent light

Appendix 7-11-2(2) Calculation of annual expenses for the SHS (55Wp: without tax and duty)

(UNIT:US$)

Payment term (year)	20	15	10	7	5	3	0	20	15	10	7	5	3	0
Discount rate (= r)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Interest charged (= i)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Capital Recovery Factor CRF =i / (1 - (1 + i)^(-n))	0.074	0.090	0.123	0.167	0.225	0.360		0.050	0.067	0.100	0.143	0.200	0.333	
Initial cost (A)	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160
Down payment (B)	30	30	30	30	30	30		30	30	30	30	30	30	
Present value of replaced battery (two unit) (C)*	317	317	317	317	317	317	317	317	317	317	317	317	317	317
Present value of replaced charge controller (D)*	79	79	79	79	79	79	79	79	79	79	79	79	79	79
Present value of O&M cost (E) *	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Total Present value (F)= (A)-(B)+(C)+(D)+(E)	1689	1689	1689	1689	1689	1689	1719	1689	1689	1689	1689	1689	1689	1719
Total annual expenses (G)=(F)*CRF	124	152	208	281	379	608		84	113	169	241	338	563	
Total monthly expenses (US$) (G)/12	**10.4**	**12.7**	**17.3**	**23.4**	**31.6**	**50.7**		**7.0**	**9.4**	**14.1**	**20.1**	**28.1**	**46.9**	
Total monthly expenses (SB$)	**51.8**	**63.3**	**86.7**	**117.2**	**158.0**	**253.5**		**35.2**	**46.9**	**70.4**	**100.5**	**140.7**	**234.5**	

Note: excluding fluorescent light

(C) = battery/(1+r)^7+battery/(1+r)^14

(D) = charge controller/(1+r)^10

(E) = $\sum_{n=1}^{20} \frac{O\ \&\ M}{(1+r)^n}$, O&M cost = US$12.0/year

Appendix 7-11-3(1) Calculation of annual expenses for the SHS (75Wp: with tax and others)

(UNIT:US$)

Payment term (year)	20	15	10	7	5	3	0	20	15	10	7	5	3	0
Discount rate (= r)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Interest charged (= i)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Capital Recovery Factor CRF =i / (1 - (1 + i)^(-n))	0.074	0.090	0.123	0.167	0.225	0.360		0.050	0.067	0.100	0.143	0.200	0.333	
Initial cost (A)	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640
Down payment (B)	30	30	30	30	30	30		30	30	30	30	30	30	
Present value of replaced battery (two unit) (C)*	487	487	487	487	487	487	487	487	487	487	487	487	487	487
Present value of replaced charge controller (D)*	97	97	97	97	97	97	97	97	97	97	97	97	97	97
Present value of O&M cost (E) *	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Total Present value (F)= (A)-(B)+(C)+(D)+(E)	2357	2357	2357	2357	2357	2357	2387	2357	2357	2357	2357	2357	2357	2387
Total annual expenses (G)=(F)*CRF	173	212	291	393	529	849		118	157	236	337	471	786	
Total monthly expenses (US$) (G)/12	**14.5**	**17.7**	**24.2**	**32.7**	**44.1**	**70.8**		**9.8**	**13.1**	**19.6**	**28.1**	**39.3**	**65.5**	
Total monthly expenses (SB$)	**72.3**	**88.3**	**121.1**	**163.6**	**220.6**	**353.8**		**49.1**	**65.5**	**98.2**	**140.3**	**196.4**	**327.3**	

Note: excluding fluorescent light

Appendix 7-11-3(2) Calculation of annual expenses for the SHS (75Wp: without tax and duty)

(UNIT:US$)

Payment term (year)	20	15	10	7	5	3	0	20	15	10	7	5	3	0
Discount rate (= r)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Interest charged (= i)	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Capital Recovery Factor CRF =i / (1 - (1 + i)^(-n))	0.074	0.090	0.123	0.167	0.225	0.360		0.050	0.067	0.100	0.143	0.200	0.333	
Initial cost (A)	1301	1301	1301	1301	1301	1301	1301	1301	1301	1301	1301	1301	1301	1301
Down payment (B)	30	30	30	30	30	30		30	30	30	30	30	30	
Present value of replaced battery (two unit) (C)*	397	397	397	397	397	397	397	397	397	397	397	397	397	397
Present value of replaced charge controller (D)*	79	79	79	79	79	79	79	79	79	79	79	79	79	79
Present value of O&M cost (E) *	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Total Present value (F)= (A)-(B)+(C)+(D)+(E)	1910	1910	1910	1910	1910	1910	1940	1910	1910	1910	1910	1910	1910	1940
Total annual expenses (G)=(F)*CRF	141	172	235	318	429	688		95	127	191	273	382	637	
Total monthly expenses (US$) (G)/12	**11.7**	**14.3**	**19.6**	**26.5**	**35.7**	**57.4**		**8.0**	**10.6**	**15.9**	**22.7**	**31.8**	**53.1**	
Total monthly expenses (SB$)	**58.6**	**71.6**	**98.1**	**132.6**	**178.7**	**286.8**		**39.8**	**53.1**	**79.6**	**113.7**	**159.2**	**265.3**	

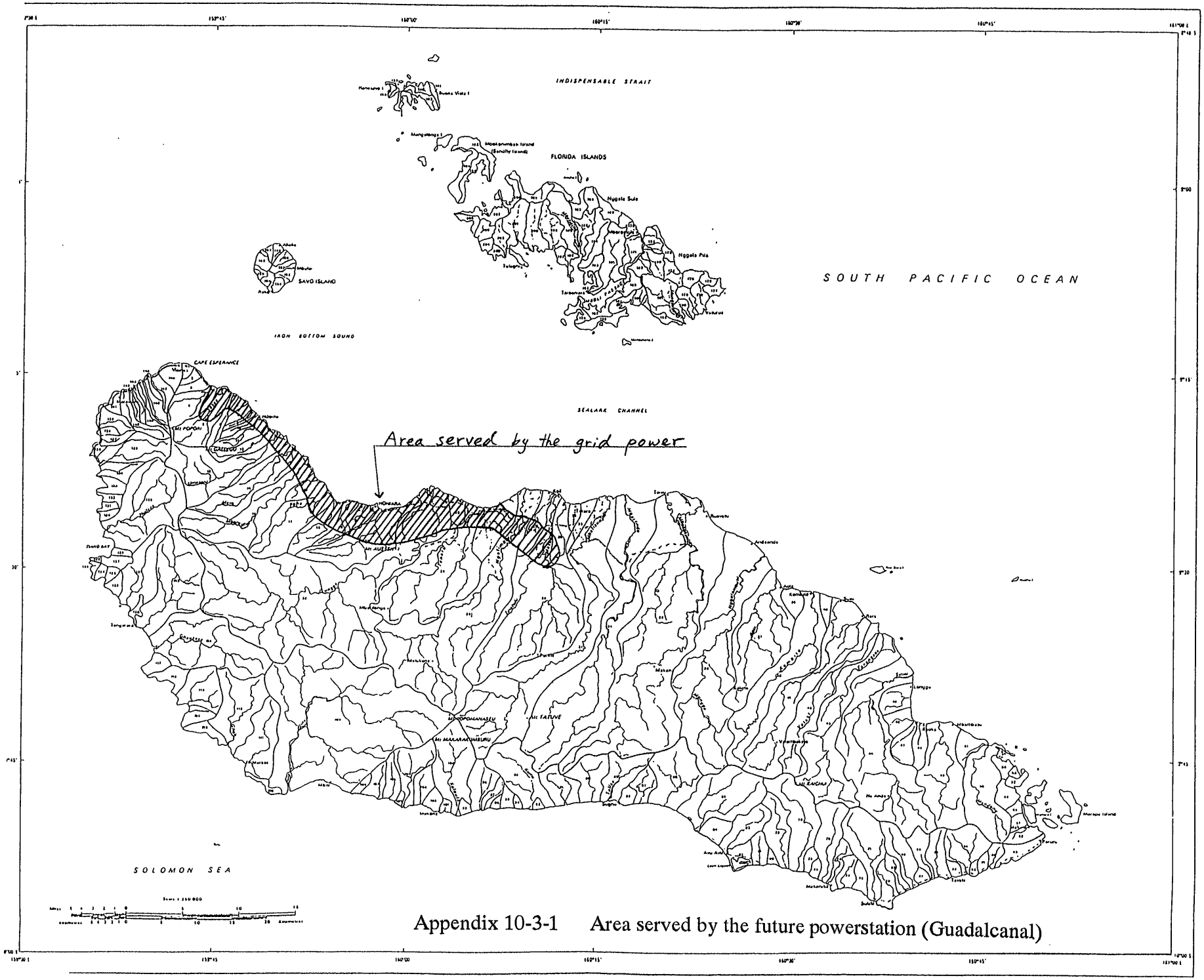
Note: excluding fluorescent light

(C) = battery/(1+r)^7+battery/(1+r)^14

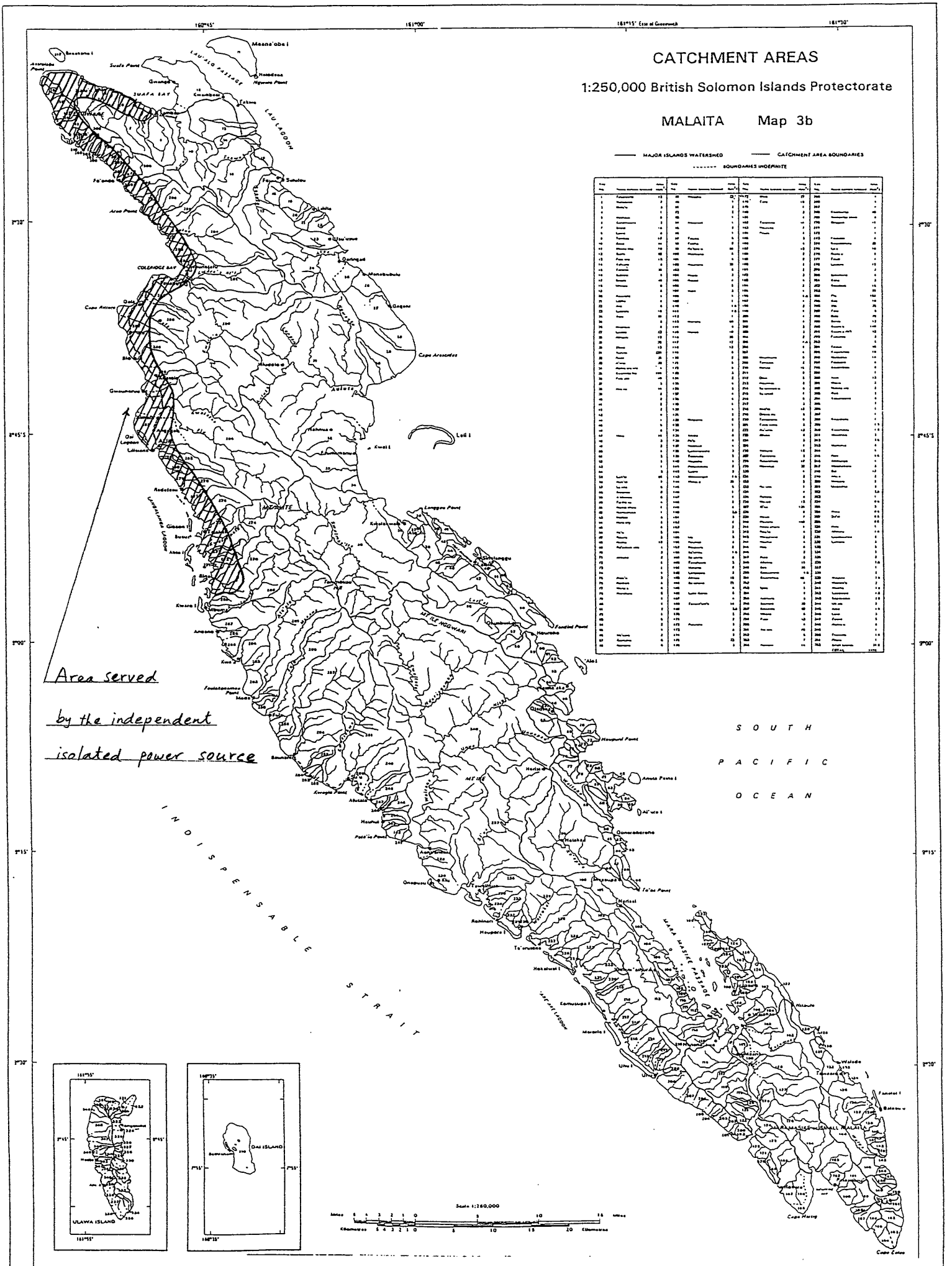
(D) = charge controller/(1+r)^10

(E) = $\sum_{n=1}^{20} \frac{O\ \&\ M}{(1+r)^n}$, O&M cost = US$12.0/year

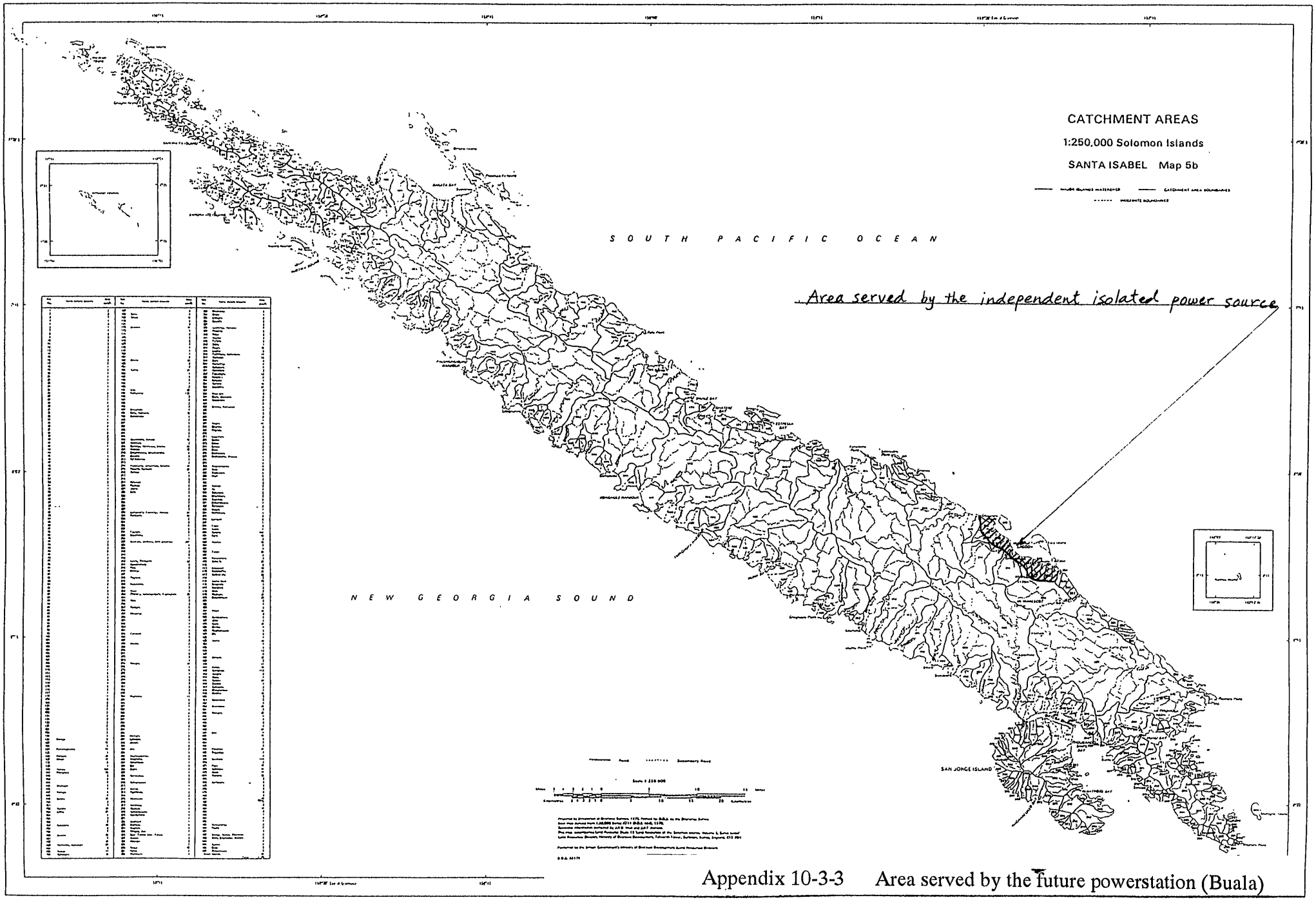
第１０章　電力供給計画



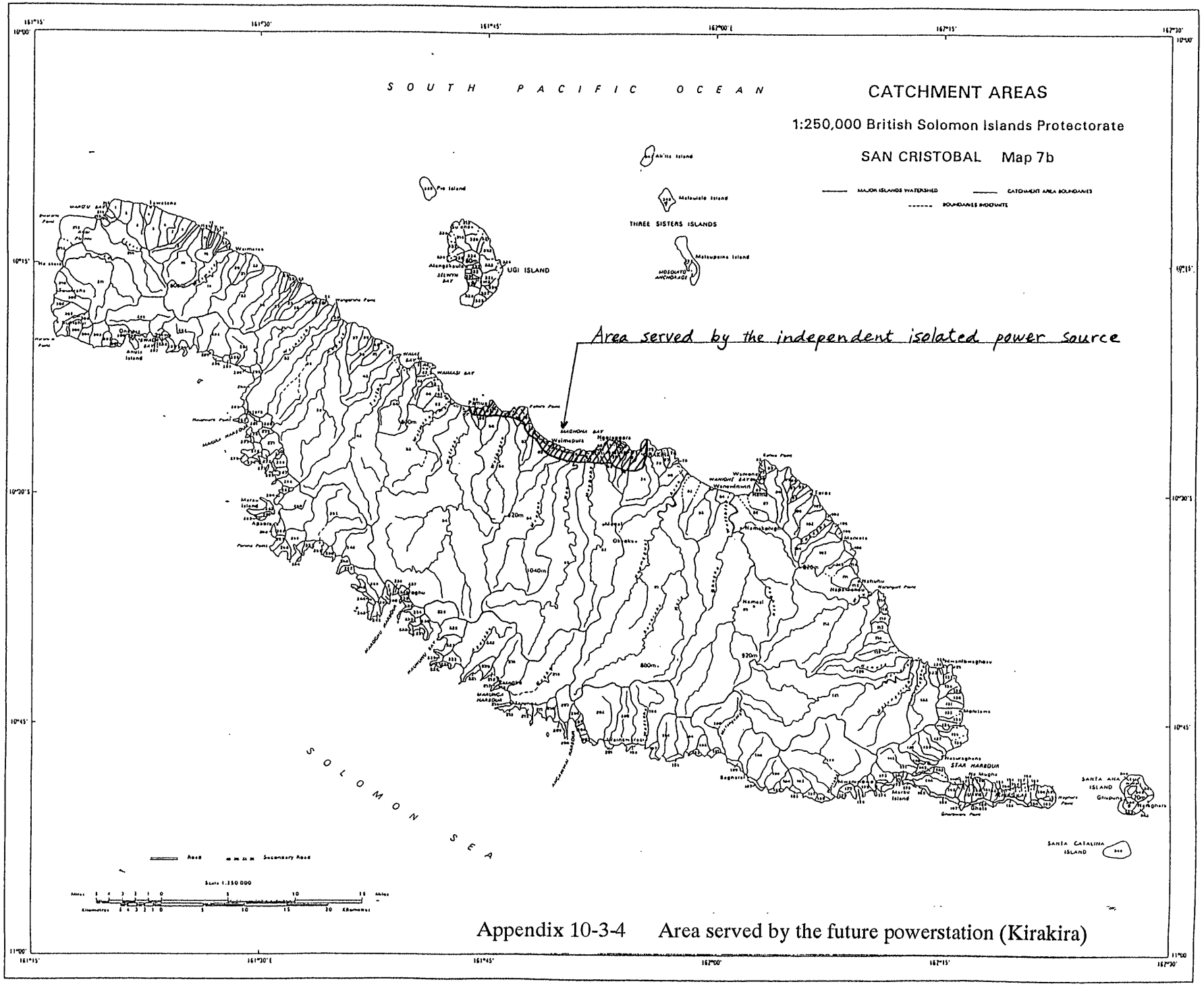
Appendix 10-3-1 Area served by the future powerstation (Guadalcanal)



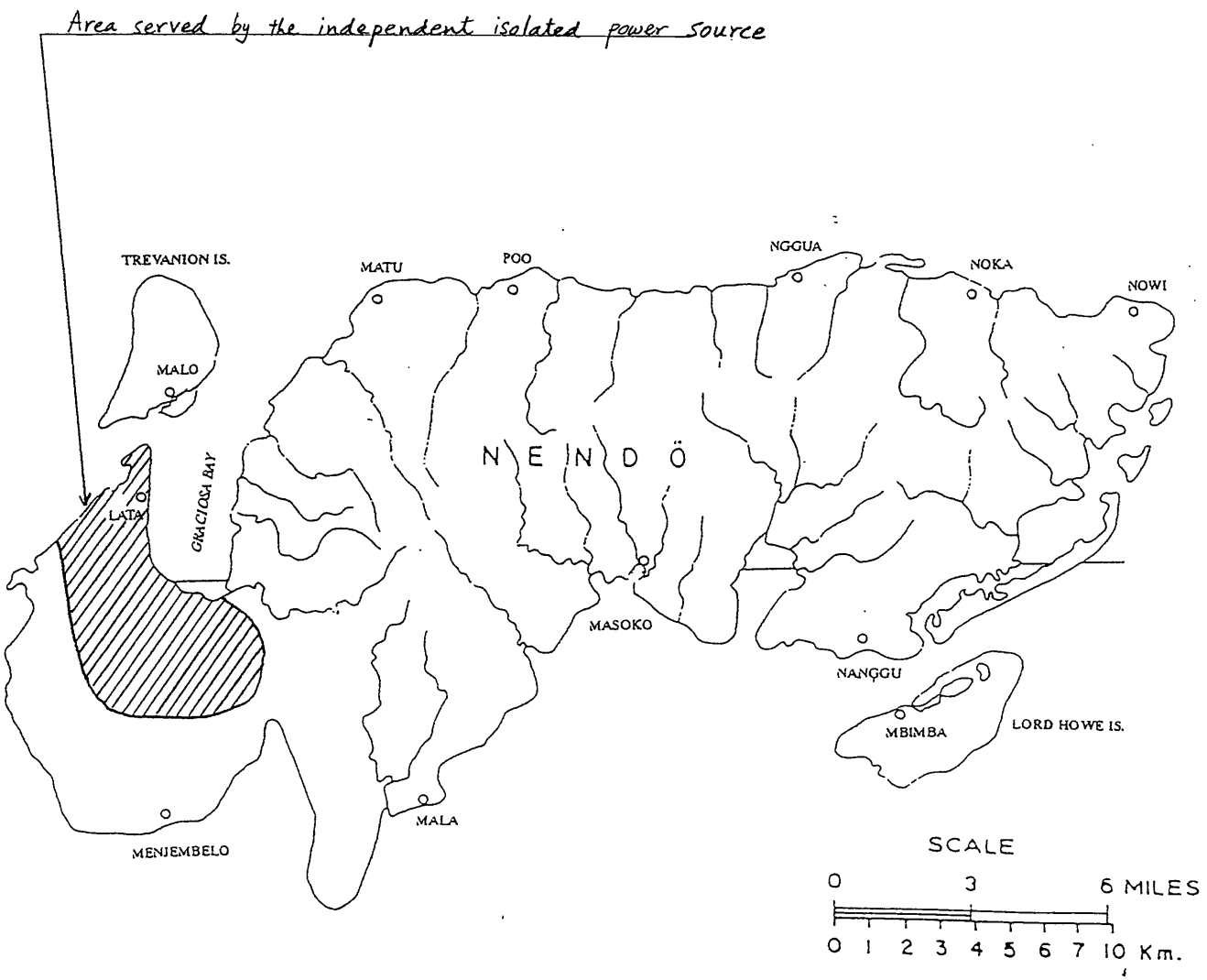
Appendix 10-3-2 Area served by the future powerstation (Auki, Malu'u)



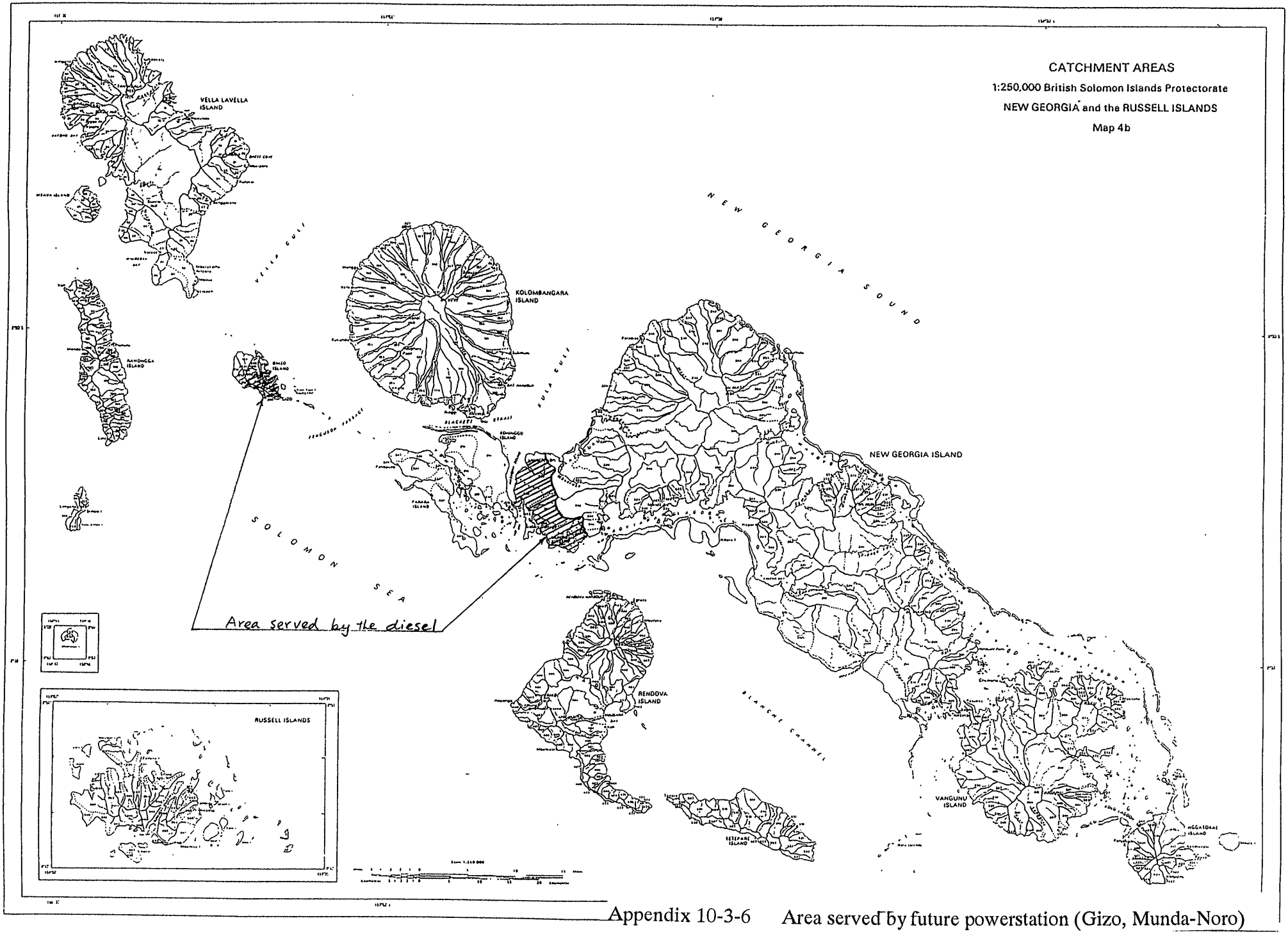
Appendix 10-3-3 Area served by the future powerstation (Buala)



Appendix 10-3-4 Area served by the future powerstation (Kirakira)



Appendix 10-3-5 Area served by the future powerstation (Lata)



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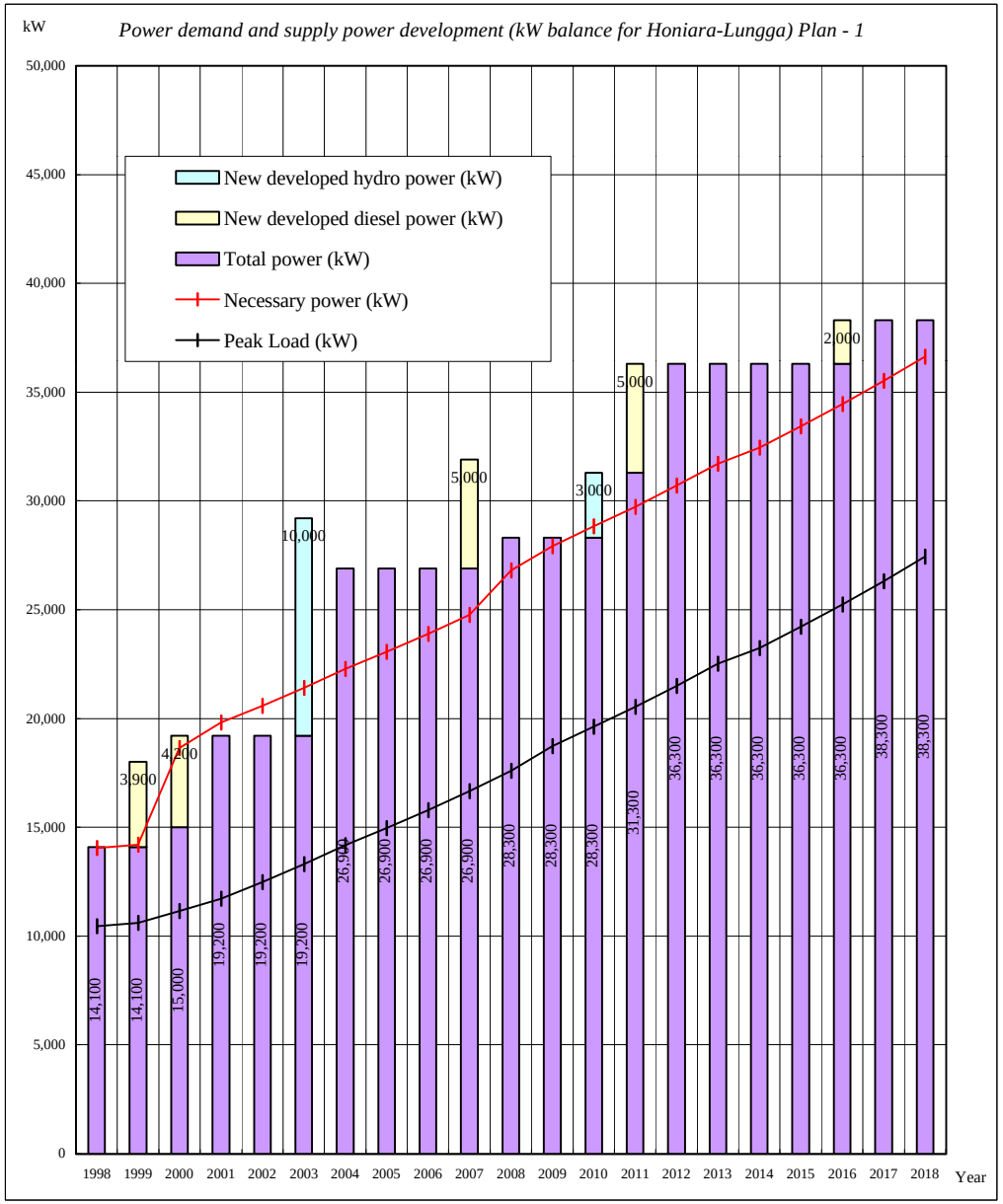
Appendix 10-3-6 Area served by future powerstation (Gizo, Munda-Noro)

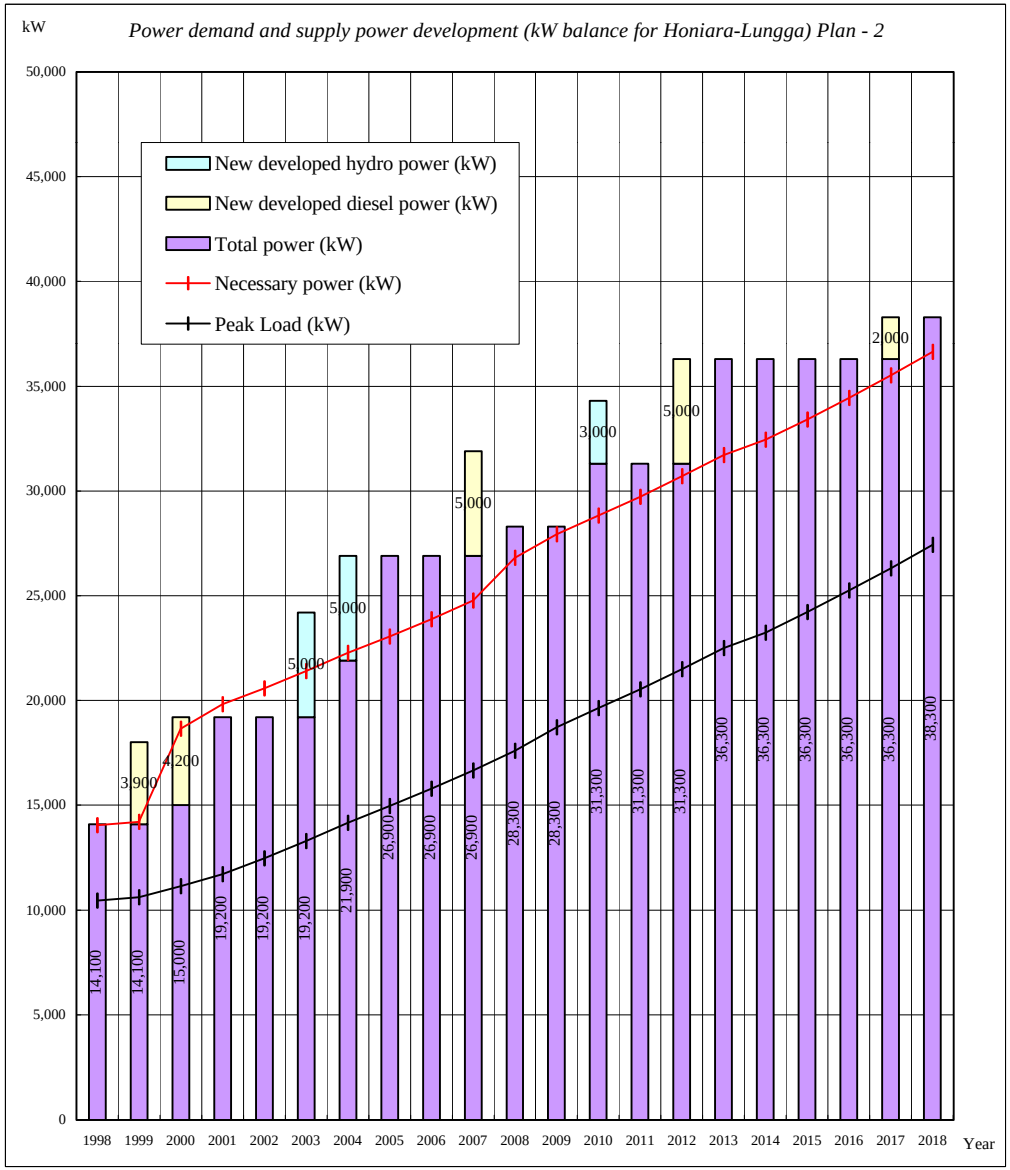
Appendix 10-3-11 Power demand and power supply development (Honira - Lungga) Plan-1

Name of new power / Year — **Plan 1**	Lungga DPS (kW)	Honiara DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
1998	10,100	4,000	0	14,100	0	0	10,450	14,050
Lungga diesel N0.9 commission 1999	10,100	4,000	0	14,100	3,900	0	10,604	14,204
Lungga diesel N0.10 install, Lungga diesel No.4 & 5 and Honiara diesel No.5 & 6 retired 2000	12,000	3,000	0	15,000	4,200	0	11,144	18,644
2001	16,200	3,000	0	19,200	0	0	11,711	19,811
2002	16,200	3,000	0	19,200	0	0	12,477	20,577
Lungga hydro No.1 and No.2 develop 2003	16,200	3,000	10,000	19,200	0	10,000	13,298	21,398
Lungga diesel No.7 retired 2004	13,900	3,000	10,000	26,900	0	0	14,168	22,268
2005	13,900	3,000	10,000	26,900	0	0	14,953	23,053
2006	13,900	3,000	10,000	26,900	0	0	15,785	23,885
Lungga diesel N0.11 install 2007	13,900	3,000	10,000	26,900	5,000	0	16,667	24,767
Lungga diesel No.8 retired 2008	15,300	3,000	10,000	28,300	0	0	17,602	26,802
2009	15,300	3,000	10,000	28,300	0	0	18,727	27,927
Maotapuku I and II develop 2010	15,300	3,000	10,000	28,300	0	3,000	19,632	28,832
Lungga diesel N0.12 install 2011	15,300	3,000	13,000	31,300	5,000	0	20,525	29,725
2012	20,300	3,000	13,000	36,300	0	0	21,495	30,695
2013	20,300	3,000	13,000	36,300	0	0	22,511	31,711
2014	20,300	3,000	13,000	36,300	0	0	23,237	32,437
2015	20,300	3,000	13,000	36,300	0	0	24,221	33,421
Lungga diesel N0.13 install 2016	20,300	3,000	13,000	36,300	2,000	0	25,247	34,447
2017	22,300	3,000	13,000	38,300	0	0	26,317	35,517
2018	22,300	3,000	13,000	38,300	0	0	27,434	36,634



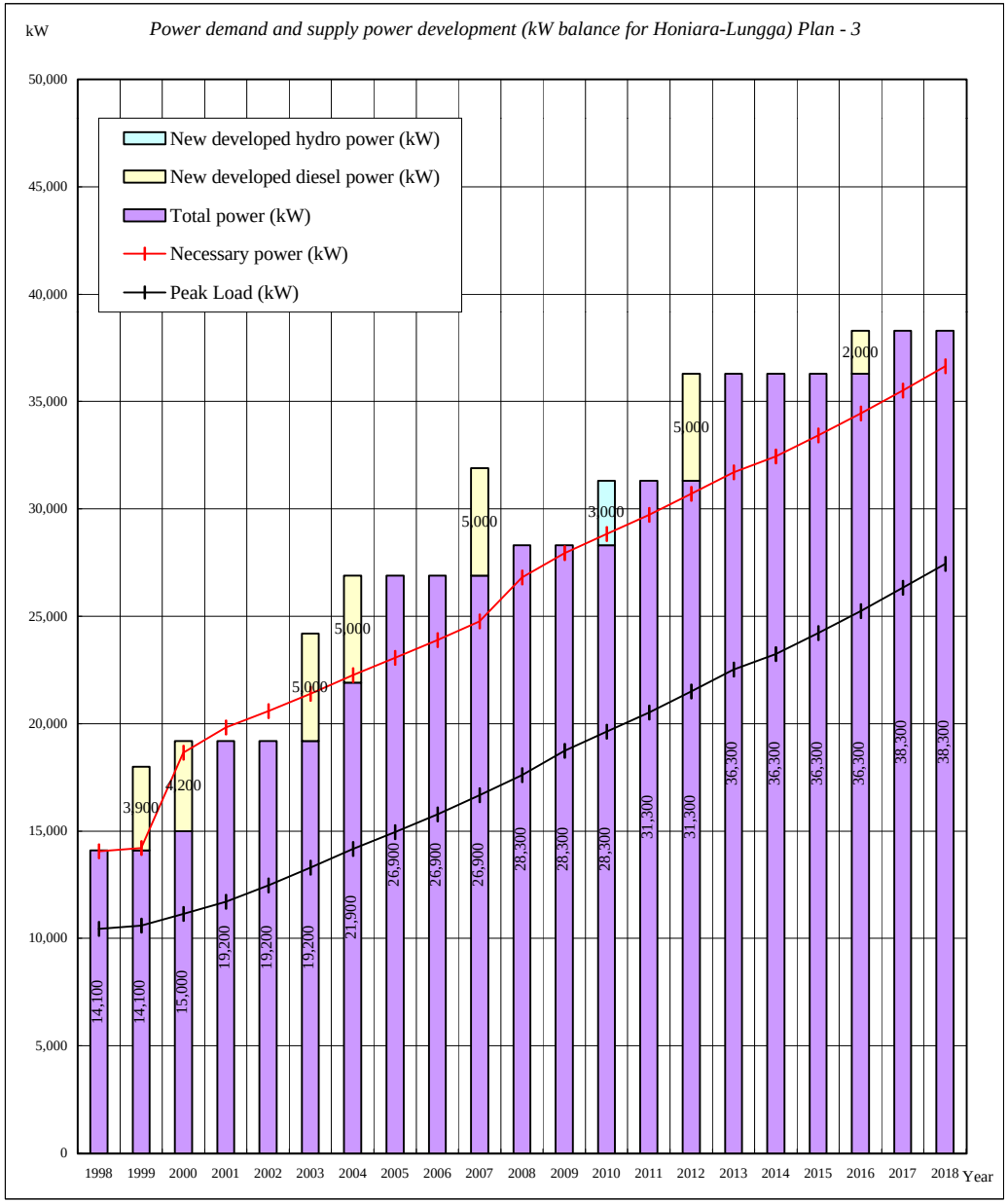
Appendix 10-3-12 Power demand and power supply development (Honira - Lungga) Plan-2

Name of new power / Year — **Plan 2**		Lungga DPS (kW)	Honiara DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	10,100	4,000	0	14,100	0	0	10,450	14,050
Lungga diesel N0.9 commission	1999	10,100	4,000	0	14,100	3,900	0	10,604	14,204
Lungga diesel N0.10 install, Lungga diesel No.4 & 5 and Honiara diesel No.5 & 6 retired	2000	12,000	3,000	0	15,000	4,200	0	11,144	18,644
	2001	16,200	3,000	0	19,200	0	0	11,711	19,811
	2002	16,200	3,000	0	19,200	0	0	12,477	20,577
Lungga hydro No.1 develop	2003	16,200	3,000	5,000	19,200	0	5,000	13,298	21,398
Lungga hydro No.2 develop, Lungga diesel No.7 retired	2004	13,900	3,000	5,000	21,900	0	5,000	14,168	22,268
	2005	13,900	3,000	10,000	26,900	0	0	14,953	23,053
	2006	13,900	3,000	10,000	26,900	0	0	15,785	23,885
Lungga diesel N0.11	2007	13,900	3,000	10,000	26,900	5,000	0	16,667	24,767
Lungga diesel No.8 retired	2008	15,300	3,000	10,000	28,300	0	0	17,602	26,802
	2009	15,300	3,000	10,000	28,300	0	0	18,727	27,927
Maotapuku I and II develop	2010	15,300	3,000	13,000	31,300	0	3,000	19,632	28,832
	2011	15,300	3,000	13,000	31,300	0	0	20,525	29,725
Lungga diesel N0.12	2012	15,300	3,000	13,000	31,300	5,000	0	21,495	30,695
	2013	20,300	3,000	13,000	36,300	0	0	22,511	31,711
	2014	20,300	3,000	13,000	36,300	0	0	23,237	32,437
	2015	20,300	3,000	13,000	36,300	0	0	24,221	33,421
	2016	20,300	3,000	13,000	36,300	0	0	25,247	34,447
Lungga diesel N0.13	2017	20,300	3,000	13,000	36,300	2,000	0	26,317	35,517
	2018	22,300	3,000	13,000	38,300	0	0	27,434	36,634



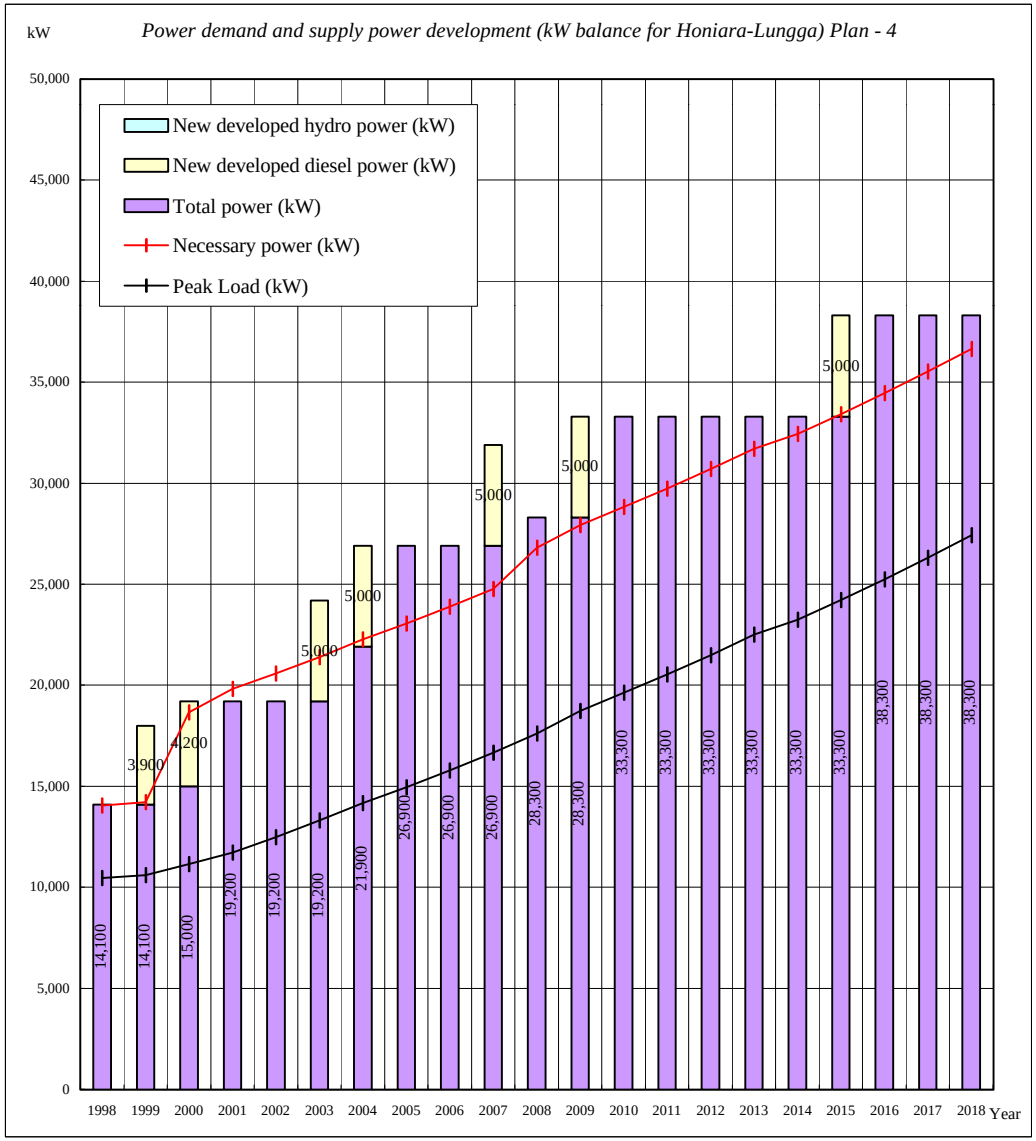
Appendix 10-3-13 Power demand and power supply development (Honira - Lungga) Plan-3

Name of new power / Plan 3 / Year		Lungga DPS (kW)	Honiara DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	10,100	4,000	0	14,100	0	0	10,450	14,050
Lungga diesel N0.9 commission	1999	10,100	4,000	0	14,100	3,900	0	10,604	14,204
Lungga diesel N0.10 install, Lungga diesel No.4 & 5 and Honiara diesel No.5 & 6 retired	2000	12,000	3,000	0	15,000	4,200	0	11,144	18,644
	2001	16,200	3,000	0	19,200	0	0	11,711	19,811
	2002	16,200	3,000	0	19,200	0	0	12,477	20,577
Lungga diesel No.11 install	2003	16,200	3,000	0	19,200	5,000	0	13,298	21,398
Lungga diesel No.12 install, Lungga diesel No.7 retired	2004	18,900	3,000	0	21,900	5,000	0	14,168	22,268
	2005	23,900	3,000	0	26,900	0	0	14,953	23,053
	2006	23,900	3,000	0	26,900	0	0	15,785	23,885
Lungga diesel N0.13 install	2007	23,900	3,000	0	26,900	5,000	0	16,667	24,767
Lungga diesel No.8 retired	2008	25,300	3,000	0	28,300	0	0	17,602	26,802
	2009	25,300	3,000	0	28,300	0	0	18,727	27,927
Maotapuku I and II develop	2010	25,300	3,000	0	28,300	0	3,000	19,632	28,832
	2011	25,300	3,000	3,000	31,300	0	0	20,525	29,725
Lungga diesel N0.14 install	2012	25,300	3,000	3,000	31,300	5,000	0	21,495	30,695
	2013	30,300	3,000	3,000	36,300	0	0	22,511	31,711
	2014	30,300	3,000	3,000	36,300	0	0	23,237	32,437
	2015	30,300	3,000	3,000	36,300	0	0	24,221	33,421
Lungga diesel N0.15 install	2016	30,300	3,000	3,000	36,300	2,000	0	25,247	34,447
	2017	32,300	3,000	3,000	38,300	0	0	26,317	35,517
	2018	32,300	3,000	3,000	38,300	0	0	27,434	36,634



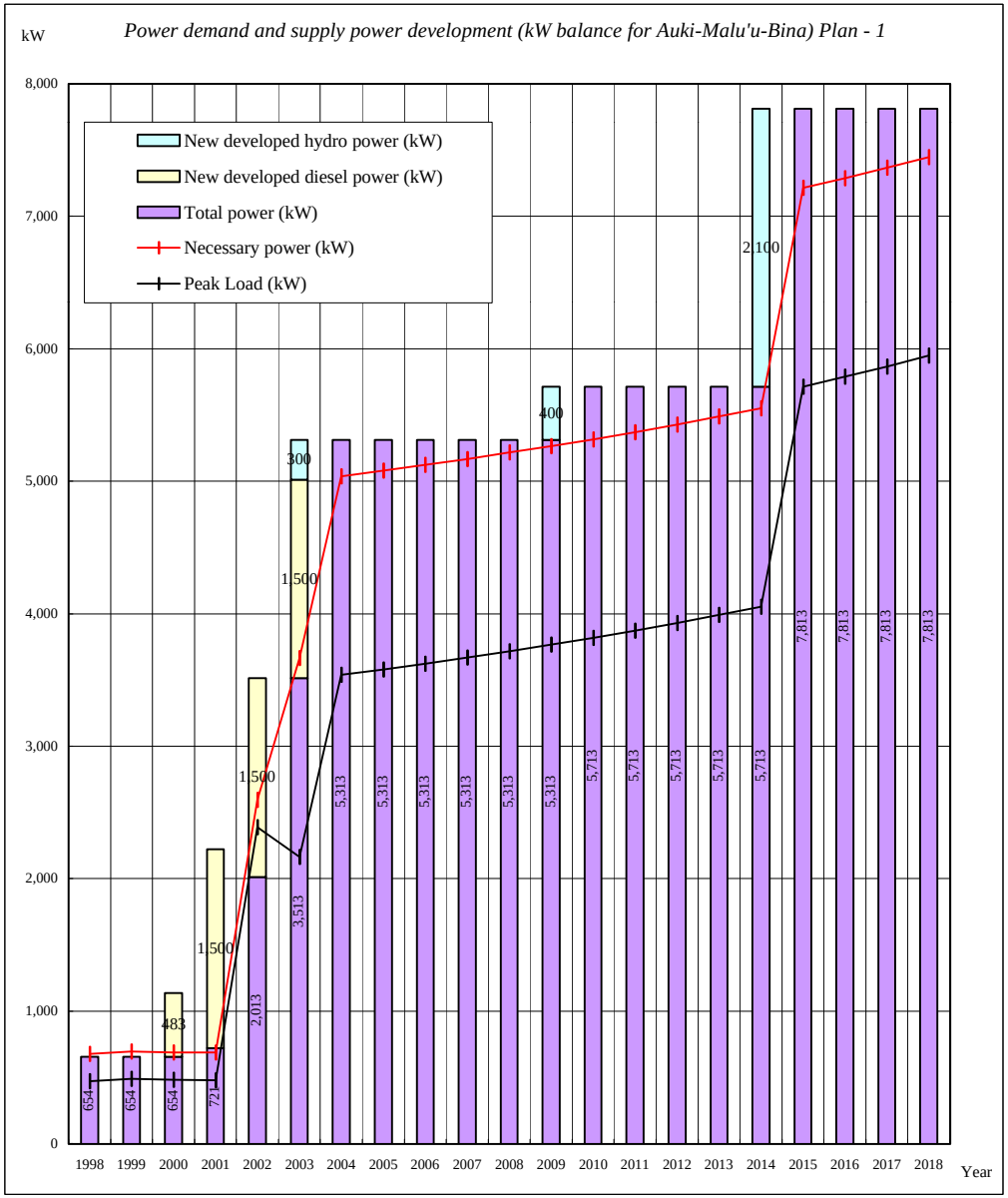
Appendix 10-3-14 Power demand and power supply development (Honira - Lungga) Plan-4

Name of new power / Year — **Plan 4**	Year	Lungga DPS (kW)	Honiara DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	10,100	4,000	0	14,100	0	0	10,450	14,050
Lungga diesel N0.9 commission	1999	10,100	4,000	0	14,100	3,900	0	10,604	14,204
Lungga diesel N0.10 install, Lungga diesel No.4 & 5 and Honiara diesel No.5 & 6 retired	2000	12,000	3,000	0	15,000	4,200	0	11,144	18,644
	2001	16,200	3,000	0	19,200	0	0	11,711	19,811
	2002	16,200	3,000	0	19,200	0	0	12,477	20,577
Lungga diesel No.11 install	2003	16,200	3,000	0	19,200	5,000	0	13,298	21,398
Lungga diesel No.12 install, Lungga diesel No.7 retired	2004	18,900	3,000	0	21,900	5,000	0	14,168	22,268
	2005	23,900	3,000	0	26,900	0	0	14,953	23,053
	2006	23,900	3,000	0	26,900	0	0	15,785	23,885
Lungga diesel N0.13 install	2007	23,900	3,000	0	26,900	5,000	0	16,667	24,767
Lungga diesel No.8 retired	2008	25,300	3,000	0	28,300	0	0	17,602	26,802
Lungga diesel No.14 install	2009	25,300	3,000	0	28,300	5,000	0	18,727	27,927
	2010	30,300	3,000	0	33,300	0	0	19,632	28,832
	2011	30,300	3,000	0	33,300	0	0	20,525	29,725
	2012	30,300	3,000	0	33,300	0	0	21,495	30,695
	2013	30,300	3,000	0	33,300	0	0	22,511	31,711
	2014	30,300	3,000	0	33,300	0	0	23,237	32,437
Lungga diesel N0.15	2015	30,300	3,000	0	33,300	5,000	0	24,221	33,421
	2016	35,300	3,000	0	38,300	0	0	25,247	34,447
	2017	35,300	3,000	0	38,300	0	0	26,317	35,517
	2018	35,300	3,000	0	38,300	0	0	27,434	36,634



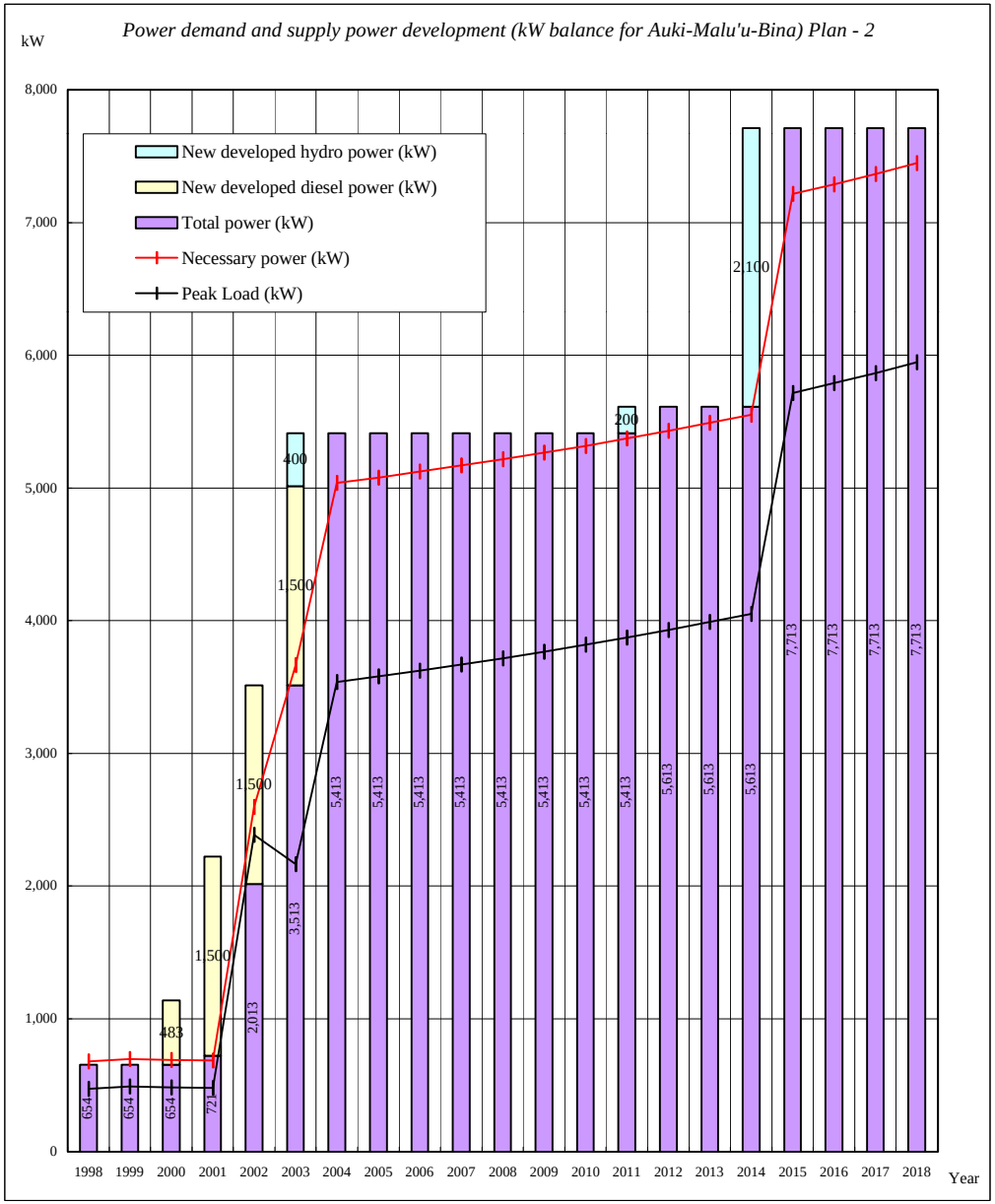
Appendix 10-3-21 Power demand and power supply development (Auki-Malu'u - Bina) Plan-1

Name of new power / Plan 1 / Year	Auki DPS + Bina DPS (kW)	Malu'u HPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
1998	624	30	0	654	0	0	470	678
1999	624	30	0	654	0	0	487	695
Auki diesel 2 units (200kW*2) replacement and Malu'u diesel 1 unit (83kW) install	624	30	0	654	483	0	481	689
Bina diesel No.1 unit (1500kW) install and existing 1 diesel retired	608	113	0	721	1,500	0	478	686
Bina diesel No.2 unit install	1,900	113	0	2,013	1,500	0	2,387	2,595
Bina diesel No.3 unit install and Rori hydro develop	3,400	113	0	3,513	1,500	300	2,164	3,664
2004	4,900	113	300	5,313	0	0	3,538	5,038
2005	4,900	113	300	5,313	0	0	3,578	5,078
2006	4,900	113	300	5,313	0	0	3,622	5,122
2007	4,900	113	300	5,313	0	0	3,668	5,168
2008	4,900	113	300	5,313	0	0	3,717	5,217
Manakwai Hydro develop	4,900	113	300	5,313	0	400	3,765	5,265
2010	4,900	113	700	5,713	0	0	3,816	5,316
2011	4,900	113	700	5,713	0	0	3,871	5,371
2012	4,900	113	700	5,713	0	0	3,929	5,429
2013	4,900	113	700	5,713	0	0	3,990	5,490
Silolo Hydro develop	4,900	113	700	5,713	0	2,100	4,051	5,551
2015	4,900	113	2,800	7,813	0	0	5,715	7,215
2016	4,900	113	2,800	7,813	0	0	5,788	7,288
2017	4,900	113	2,800	7,813	0	0	5,866	7,366
2018	4,900	113	2,800	7,813	0	0	5,948	7,448



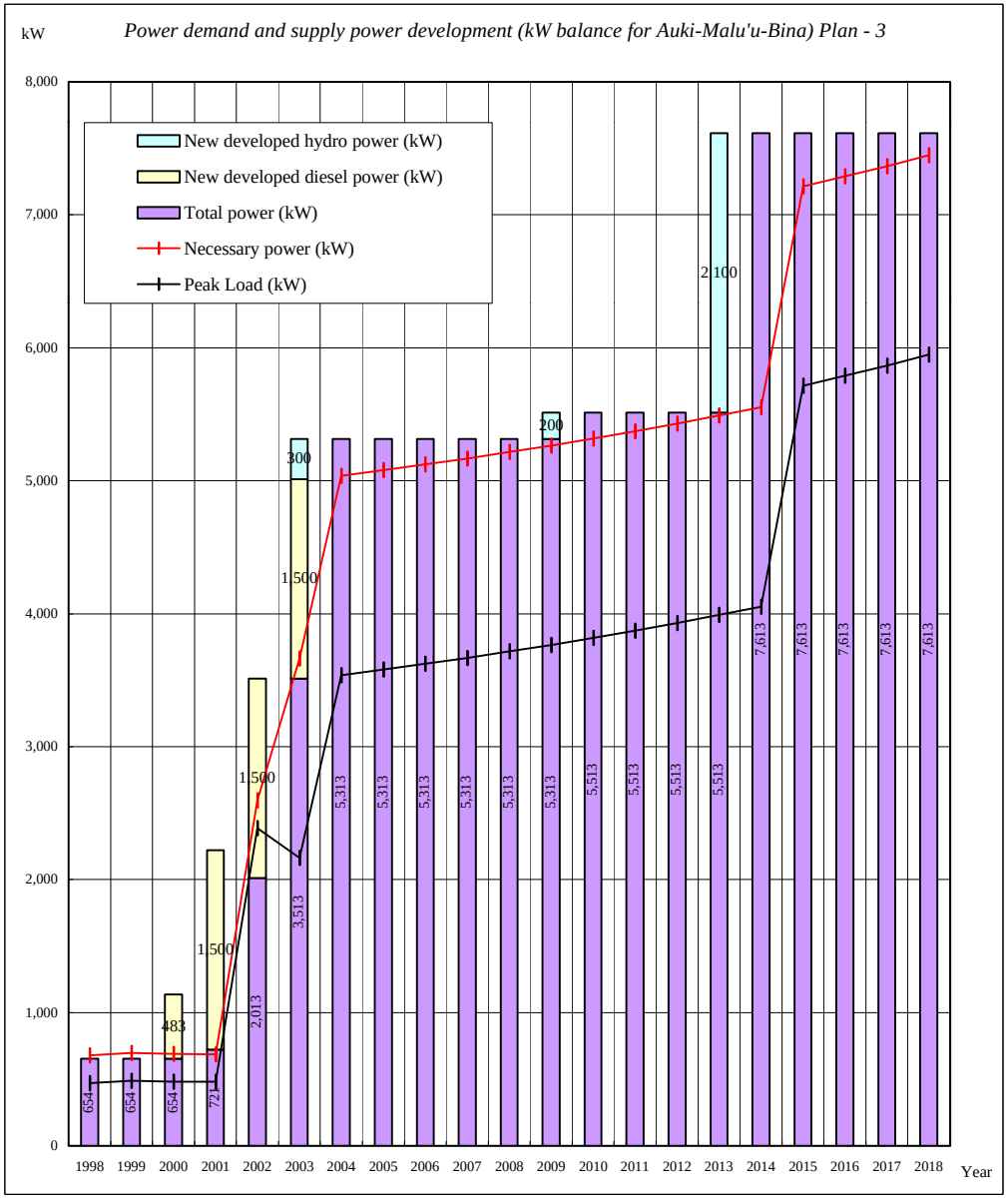
Appendix 10-3-22 Power demand and power supply development (Auki-Malu'u - Bina) Plan-2

Name of new power / Plan 2 / Year	Auki DPS + Bina DPS (kW)	Malu'u HPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
1998	624	30	0	654	0	0	470	678
1999	624	30	0	654	0	0	487	695
Auki diesel 2 units (200kW*2) replacement and Malu'u diesel 1 unit (83kW) install — 2000	624	30	0	654	483	0	481	689
Bina diesel No.1 unit (1500kW) install and existing 1 diesel retired — 2001	608	113	0	721	1,500	0	478	686
Bina diesel No.2 unit installation — 2002	1,900	113	0	2,013	1,500	0	2,387	2,595
Bina diesel No.3 unit install and Manakwai hydro develop — 2003	3,400	113	0	3,513	1,500	400	2,164	3,664
2004	4,900	113	400	5,413	0	0	3,538	5,038
2005	4,900	113	400	5,413	0	0	3,578	5,078
2006	4,900	113	400	5,413	0	0	3,622	5,122
2007	4,900	113	400	5,413	0	0	3,668	5,168
2008	4,900	113	400	5,413	0	0	3,717	5,217
2009	4,900	113	400	5,413	0	0	3,765	5,265
2010	4,900	113	400	5,413	0	0	3,816	5,316
Ruala'e Hydro develop — 2011	4,900	113	400	5,413	0	200	3,871	5,371
2012	4,900	113	600	5,613	0	0	3,929	5,429
2013	4,900	113	600	5,613	0	0	3,990	5,490
Silolo Hydro develop — 2014	4,900	113	600	5,613	0	2,100	4,051	5,551
2015	4,900	113	2,700	7,713	0	0	5,715	7,215
2016	4,900	113	2,700	7,713	0	0	5,788	7,288
2017	4,900	113	2,700	7,713	0	0	5,866	7,366
2018	4,900	113	2,700	7,713	0	0	5,948	7,448



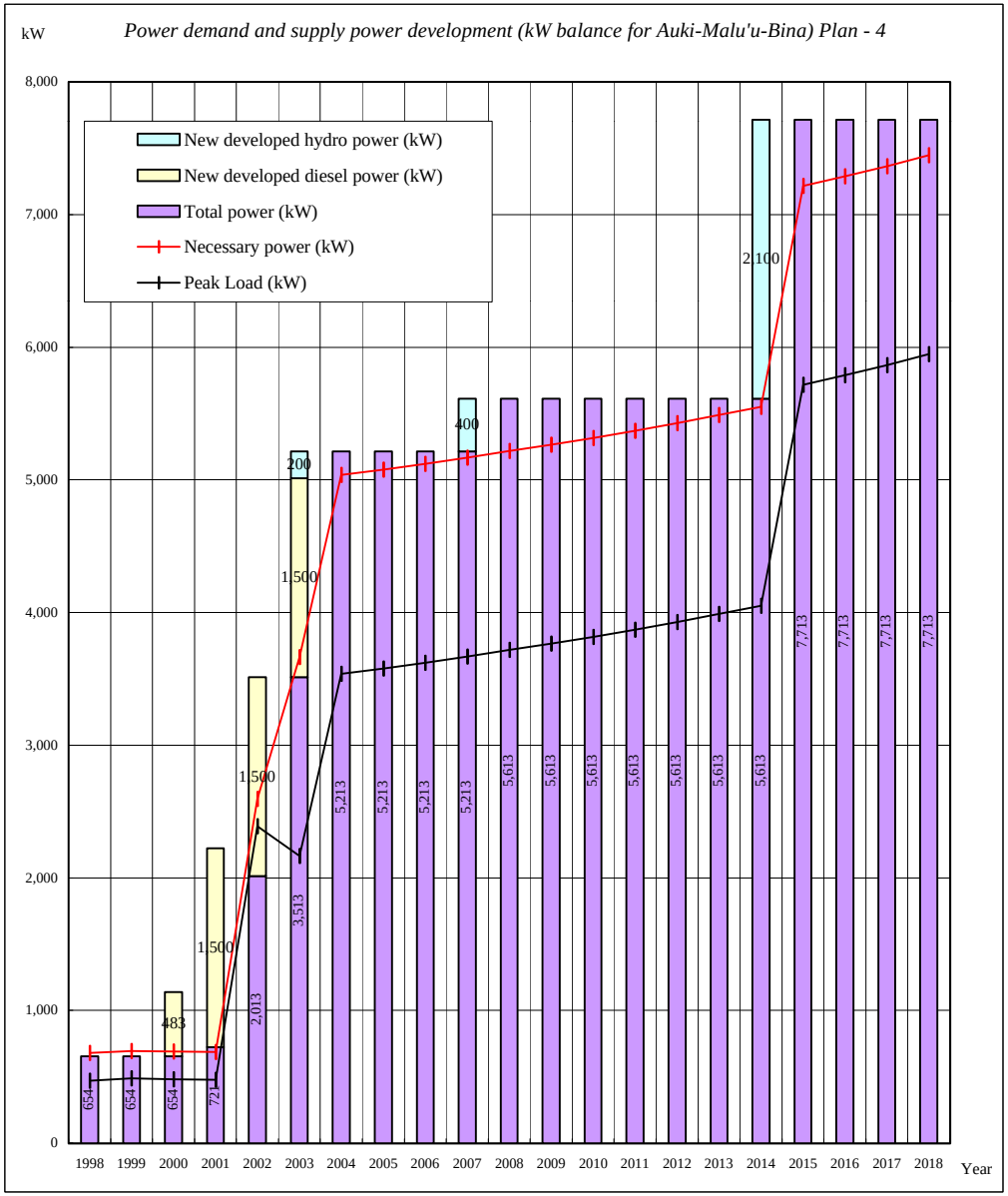
Appendix 10-3-23 Power demand and power supply development (Auki-Malu'u - Bina) Plan-3

Name of new power / Year	Plan 3	Auki DPS + Bina DPS (kW)	Malu'u HPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	624	30	0	654	0	0	470	678
	1999	624	30	0	654	0	0	487	695
Auki diesel 2 units (200kW*2) replacement and Malu'u diesel 1 unit (83kW) install	2000	624	30	0	654	483	0	481	689
Bina diesel No.1 unit (1500kW) install and existing 1 diesel retired	2001	608	113	0	721	1,500	0	478	686
Bina diesel No.2 unit install	2002	1,900	113	0	2,013	1,500	0	2,387	2,595
Bina diesel No.3 unit install and Rori hydro develop	2003	3,400	113	0	3,513	1,500	300	2,164	3,664
	2004	4,900	113	300	5,313	0	0	3,538	5,038
	2005	4,900	113	300	5,313	0	0	3,578	5,078
	2006	4,900	113	300	5,313	0	0	3,622	5,122
	2007	4,900	113	300	5,313	0	0	3,668	5,168
	2008	4,900	113	300	5,313	0	0	3,717	5,217
Ruala'e Hydro develop	2009	4,900	113	300	5,313	0	200	3,765	5,265
	2010	4,900	113	500	5,513	0	0	3,816	5,316
	2011	4,900	113	500	5,513	0	0	3,871	5,371
	2012	4,900	113	500	5,513	0	0	3,929	5,429
Silolo Hydro develop	2013	4,900	113	500	5,513	0	2,100	3,990	5,490
	2014	4,900	113	2,600	7,613	0	0	4,051	5,551
	2015	4,900	113	2,600	7,613	0	0	5,715	7,215
	2016	4,900	113	2,600	7,613	0	0	5,788	7,288
	2017	4,900	113	2,600	7,613	0	0	5,866	7,366
	2018	4,900	113	2,600	7,613	0	0	5,948	7,448



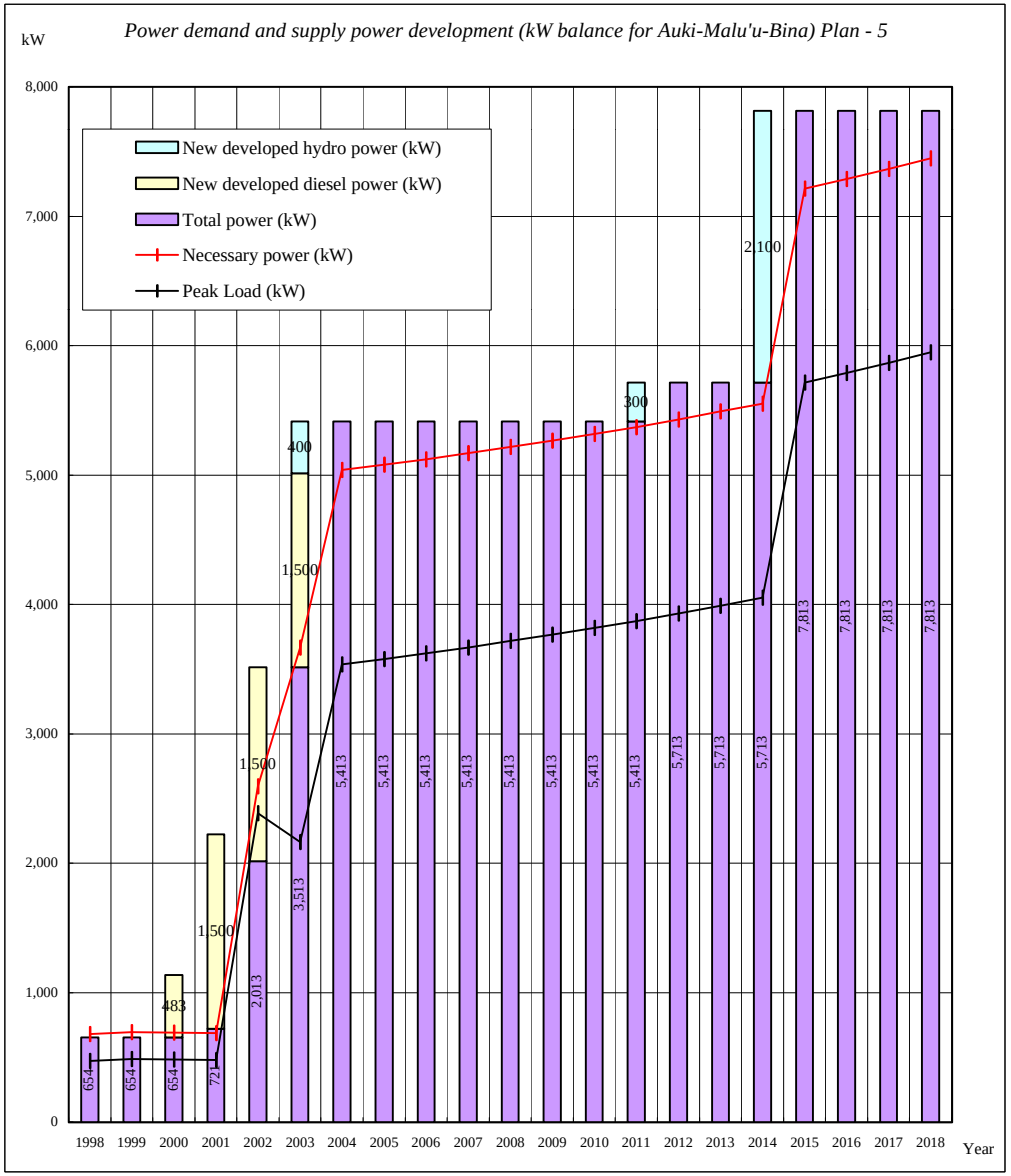
Appendix 10-3-24 Power demand and power supply development (Auki-Malu'u - Bina) Plan-4

Name of new power / Year	Plan 4	Auki DPS + Bina DPS (kW)	Malu'u HPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	624	30	0	654	0	0	470	678
	1999	624	30	0	654	0	0	487	695
Auki diesel 2 units (200kW*2) replacement and Malu'u diesel 1 unit (83kW) install	2000	624	30	0	654	483	0	481	689
Bina diesel No.1 unit (1500kW) install and existing 1 diesel retired	2001	608	113	0	721	1,500	0	478	686
Bina diesel No.2 unit install	2002	1,900	113	0	2,013	1,500	0	2,387	2,595
Bina diesel No.3 unit install and Ruala'e hydro develop	2003	3,400	113	0	3,513	1,500	200	2,164	3,664
	2004	4,900	113	200	5,213	0	0	3,538	5,038
	2005	4,900	113	200	5,213	0	0	3,578	5,078
	2006	4,900	113	200	5,213	0	0	3,622	5,122
Manakwai hydro develop	2007	4,900	113	200	5,213	0	400	3,668	5,168
	2008	4,900	113	600	5,613	0	0	3,717	5,217
	2009	4,900	113	600	5,613	0	0	3,765	5,265
	2010	4,900	113	600	5,613	0	0	3,816	5,316
	2011	4,900	113	600	5,613	0	0	3,871	5,371
	2012	4,900	113	600	5,613	0	0	3,929	5,429
	2013	4,900	113	600	5,613	0	0	3,990	5,490
Silolo Hydro develop	2014	4,900	113	600	5,613	0	2,100	4,051	5,551
	2015	4,900	113	2,700	7,713	0	0	5,715	7,215
	2016	4,900	113	2,700	7,713	0	0	5,788	7,288
	2017	4,900	113	2,700	7,713	0	0	5,866	7,366
	2018	4,900	113	2,700	7,713	0	0	5,948	7,448



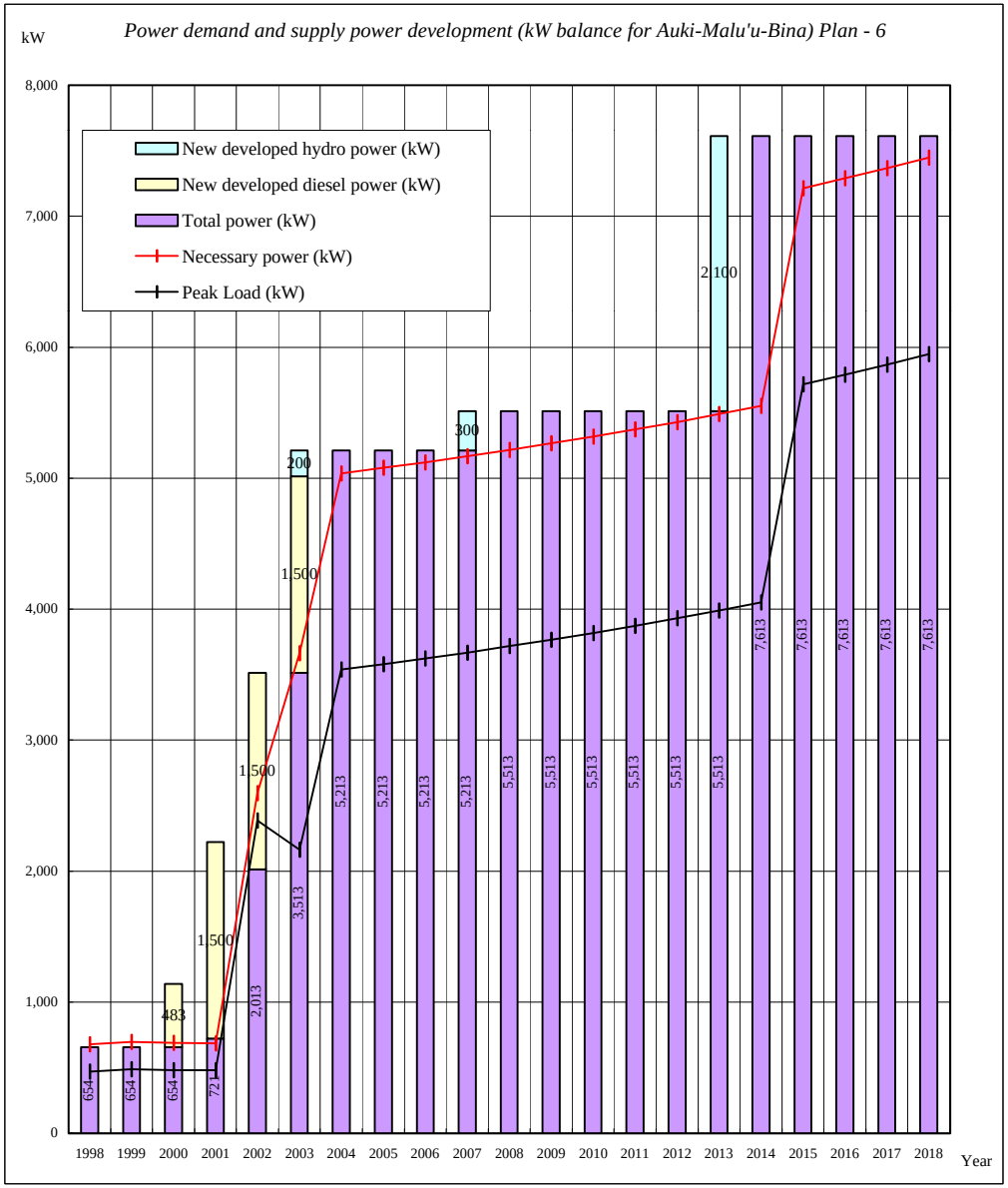
Appendix 10-3-25 Power demand and power supply development (Auki-Malu'u - Bina) Plan-5

Name of new power / Year	Plan 5	Auki DPS + Bina DPS (kW)	Malu'u HPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	624	30	0	654	0	0	470	678
	1999	624	30	0	654	0	0	487	695
Auki diesel 2 units (200kW*2) replacement and Malu'u diesel 1 unit (83kW) install	2000	624	30	0	654	483	0	481	689
Bina diesel No.1 unit (1500kW) install and existing 1 diesel retired	2001	608	113	0	721	1,500	0	478	686
Bina diesel No.2 unit install	2002	1,900	113	0	2,013	1,500	0	2,387	2,595
Bina diesel No.3 unit install and Manakwai hydro develop	2003	3,400	113	0	3,513	1,500	400	2,164	3,664
	2004	4,900	113	400	5,413	0	0	3,538	5,038
	2005	4,900	113	400	5,413	0	0	3,578	5,078
	2006	4,900	113	400	5,413	0	0	3,622	5,122
	2007	4,900	113	400	5,413	0	0	3,668	5,168
	2008	4,900	113	400	5,413	0	0	3,717	5,217
	2009	4,900	113	400	5,413	0	0	3,765	5,265
	2010	4,900	113	400	5,413	0	0	3,816	5,316
Rori hydro develop	2011	4,900	113	400	5,413	0	300	3,871	5,371
	2012	4,900	113	700	5,713	0	0	3,929	5,429
	2013	4,900	113	700	5,713	0	0	3,990	5,490
Silolo Hydro develop	2014	4,900	113	700	5,713	0	2,100	4,051	5,551
	2015	4,900	113	2,800	7,813	0	0	5,715	7,215
	2016	4,900	113	2,800	7,813	0	0	5,788	7,288
	2017	4,900	113	2,800	7,813	0	0	5,866	7,366
	2018	4,900	113	2,800	7,813	0	0	5,948	7,448



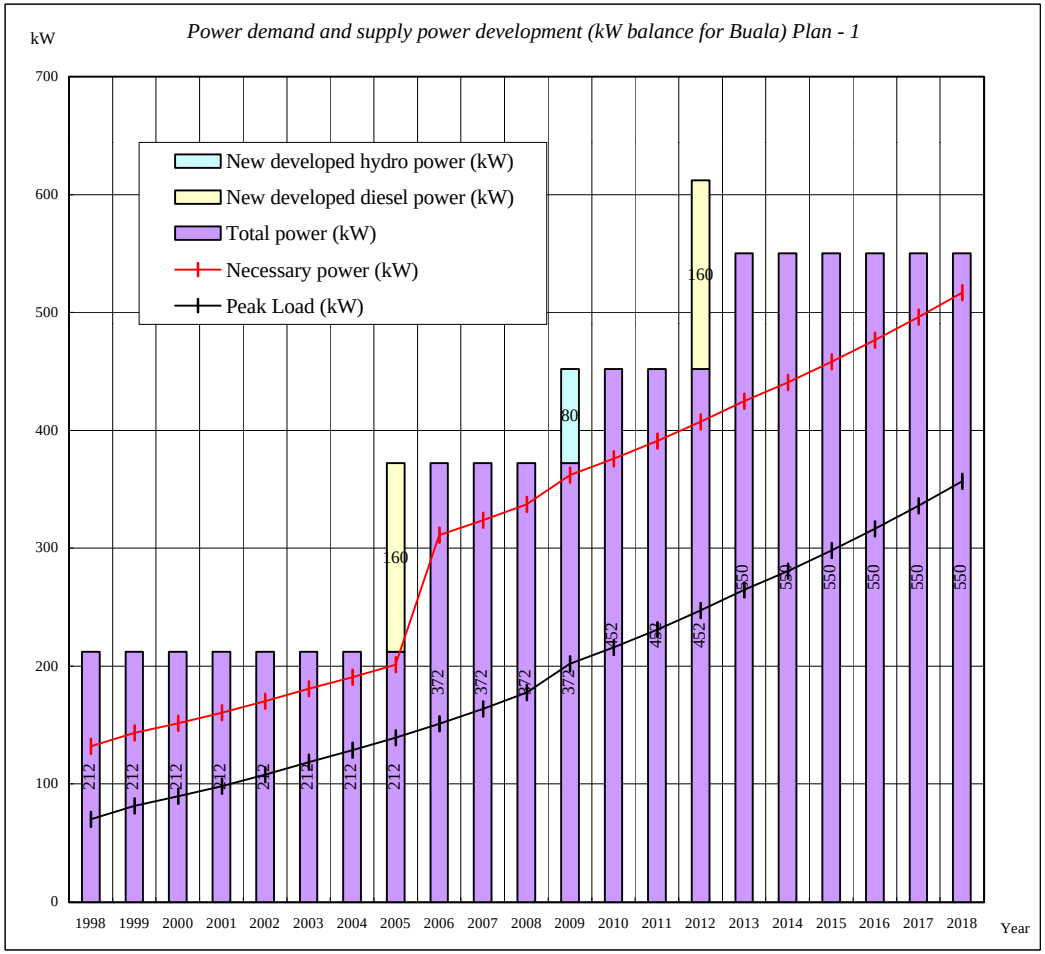
Appendix 10-3-26 Power demand and power supply development (Auki-Malu'u - Bina) Plan-6

Name of new power / Year — **Plan 6**	Year	Auki DPS + Bina DPS (kW)	Malu'u HPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	624	30	0	654	0	0	470	678
	1999	624	30	0	654	0	0	487	695
Auki diesel 2 units (200kW*2) replacement and Malu'u diesel 1 unit (83kW) install	2000	624	30	0	654	483	0	481	689
Bina diesel No.1 unit (1500kW) install and existing 1 diesel retired	2001	608	113	0	721	1,500	0	478	686
Bina diesel No.2 unit install	2002	1,900	113	0	2,013	1,500	0	2,387	2,595
Bina diesel No.3 unit install and Ruala'e hydro develop	2003	3,400	113	0	3,513	1,500	200	2,164	3,664
	2004	4,900	113	200	5,213	0	0	3,538	5,038
	2005	4,900	113	200	5,213	0	0	3,578	5,078
	2006	4,900	113	200	5,213	0	0	3,622	5,122
Rori hydro develop	2007	4,900	113	200	5,213	0	300	3,668	5,168
	2008	4,900	113	500	5,513	0	0	3,717	5,217
	2009	4,900	113	500	5,513	0	0	3,765	5,265
	2010	4,900	113	500	5,513	0	0	3,816	5,316
	2011	4,900	113	500	5,513	0	0	3,871	5,371
	2012	4,900	113	500	5,513	0	0	3,929	5,429
Silolo Hydro develop	2013	4,900	113	500	5,513	0	2,100	3,990	5,490
	2014	4,900	113	2,600	7,613	0	0	4,051	5,551
	2015	4,900	113	2,600	7,613	0	0	5,715	7,215
	2016	4,900	113	2,600	7,613	0	0	5,788	7,288
	2017	4,900	113	2,600	7,613	0	0	5,866	7,366
	2018	4,900	113	2,600	7,613	0	0	5,948	7,448



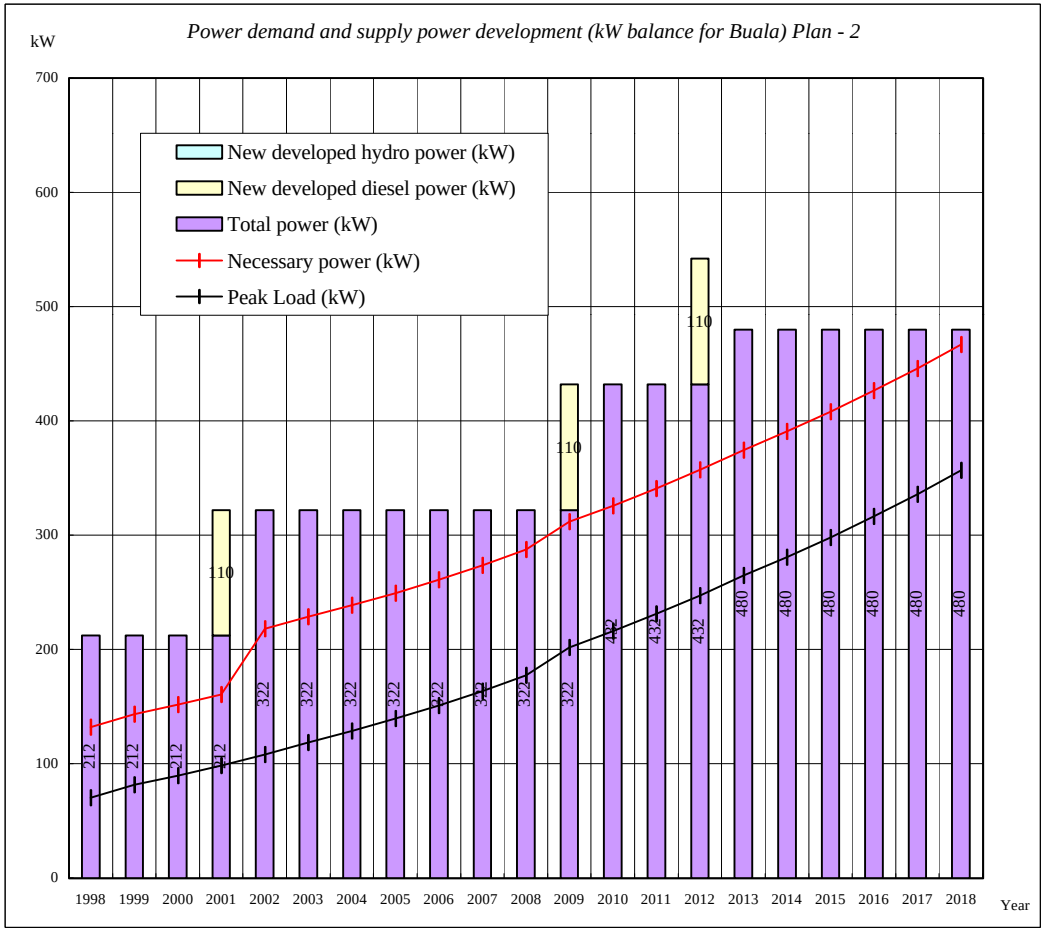
Appendix 10-3-31 Power demand and power supply development (Buala) Plan-1

Name of new power / **Plan 1** / Year		Buala HPS (kW)	Buala DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	150	62	0	212	0	0	70	132
	1999	150	62	0	212	0	0	81	143
	2000	150	62	0	212	0	0	89	151
	2001	150	62	0	212	0	0	98	160
	2002	150	62	0	212	0	0	108	170
	2003	150	62	0	212	0	0	119	181
	2004	150	62	0	212	0	0	129	191
New diesel No.2 install	2005	150	62	0	212	160	0	139	201
	2006	150	222	0	372	0	0	151	311
	2007	150	222	0	372	0	0	164	324
	2008	150	222	0	372	0	0	177	337
Kubolata hydro develop	2009	150	222	0	372	0	80	202	362
	2010	150	222	80	452	0	0	216	376
	2011	150	222	80	452	0	0	231	391
New diesel No.3 install	2012	150	222	80	452	160	0	247	407
Exist. old diesel retired	2013	150	320	80	550	0	0	265	425
	2014	150	320	80	550	0	0	281	441
	2015	150	320	80	550	0	0	298	458
	2016	150	320	80	550	0	0	316	476
	2017	150	320	80	550	0	0	336	496
	2018	150	320	80	550	0	0	357	517



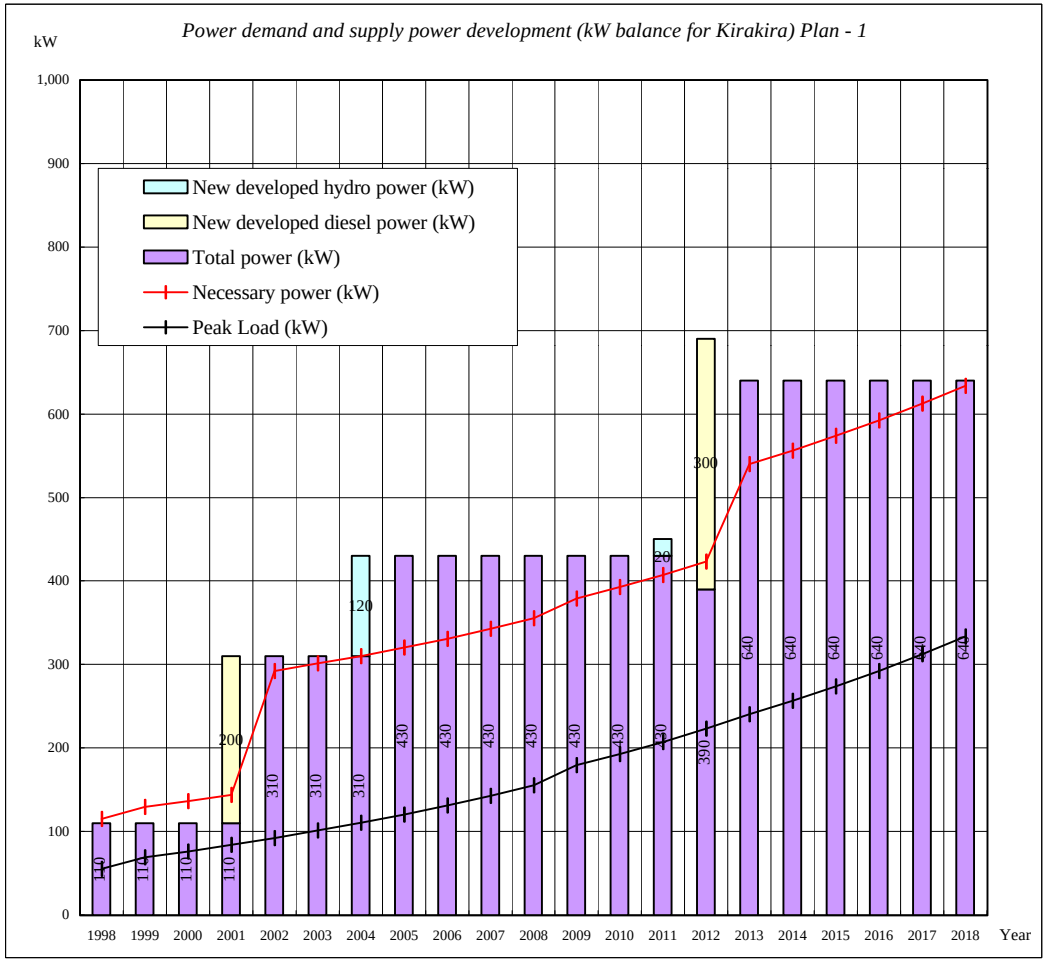
Appendix 10-3-32 Power demand and power supply development (Buala) Plan-2

Name of new power / Plan 2 / Year		Buala HPS (kW)	Buala DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	150	62	0	212	0	0	70	132
	1999	150	62	0	212	0	0	81	143
	2000	150	62	0	212	0	0	89	151
New diesel No.2 install	2001	150	62	0	212	110	0	98	160
	2002	150	172	0	322	0	0	108	218
	2003	150	172	0	322	0	0	119	229
	2004	150	172	0	322	0	0	129	239
	2005	150	172	0	322	0	0	139	249
	2006	150	172	0	322	0	0	151	261
	2007	150	172	0	322	0	0	164	274
	2008	150	172	0	322	0	0	177	287
New diesel No.3 install	2009	150	172	0	322	110	0	202	312
	2010	150	282	0	432	0	0	216	326
	2011	150	282	0	432	0	0	231	341
New diesel No.4 install	2012	150	282	0	432	110	0	247	357
Exist. old diesel retired	2013	150	330	0	480	0	0	265	375
	2014	150	330	0	480	0	0	281	391
	2015	150	330	0	480	0	0	298	408
	2016	150	330	0	480	0	0	316	426
	2017	150	330	0	480	0	0	336	446
	2018	150	330	0	480	0	0	357	467



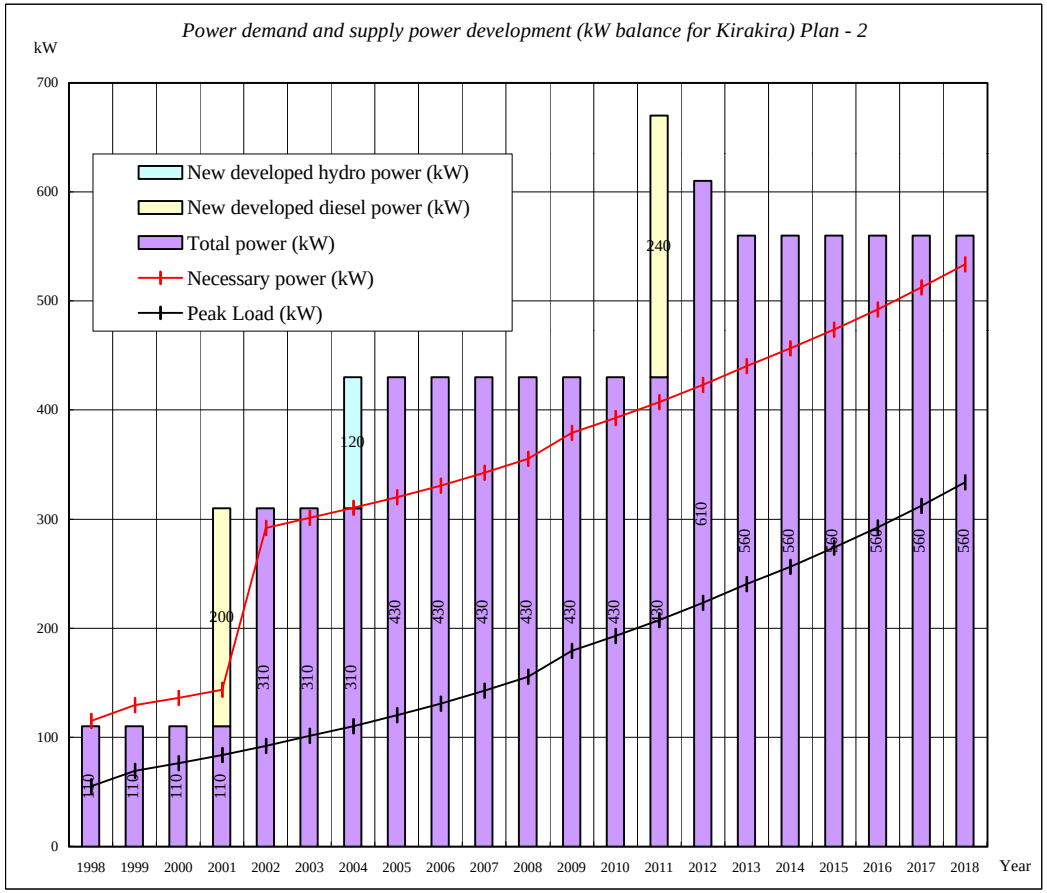
Appendix 10-3-41 Power demand and power supply development (Kirakira) Plan-1

Name of new power / Year — **Plan 1**		Kirakira DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	110	0	110	0	0	55	115
	1999	110	0	110	0	0	69	129
	2000	110	0	110	0	0	76	136
New diesel No.4 install	2001	110	0	110	200	0	84	144
	2002	310	0	310	0	0	92	292
	2003	310	0	310	0	0	101	301
Huro hydro develop	2004	310	0	310	0	120	110	310
	2005	310	120	430	0	0	120	320
	2006	310	120	430	0	0	131	331
	2007	310	120	430	0	0	143	343
	2008	310	120	430	0	0	155	355
	2009	310	120	430	0	0	179	379
	2010	310	120	430	0	0	193	393
Waimapur hydro develop	2011	310	120	430	0	20	207	407
New diesel No.5 install, existing diesel No.1 retired	2012	250	140	390	300	0	223	423
Existing diesel No.2 retired	2013	500	140	640	0	0	240	540
	2014	500	140	640	0	0	256	556
	2015	500	140	640	0	0	274	574
	2016	500	140	640	0	0	292	592
	2017	500	140	640	0	0	312	612
	2018	500	140	640	0	0	334	634



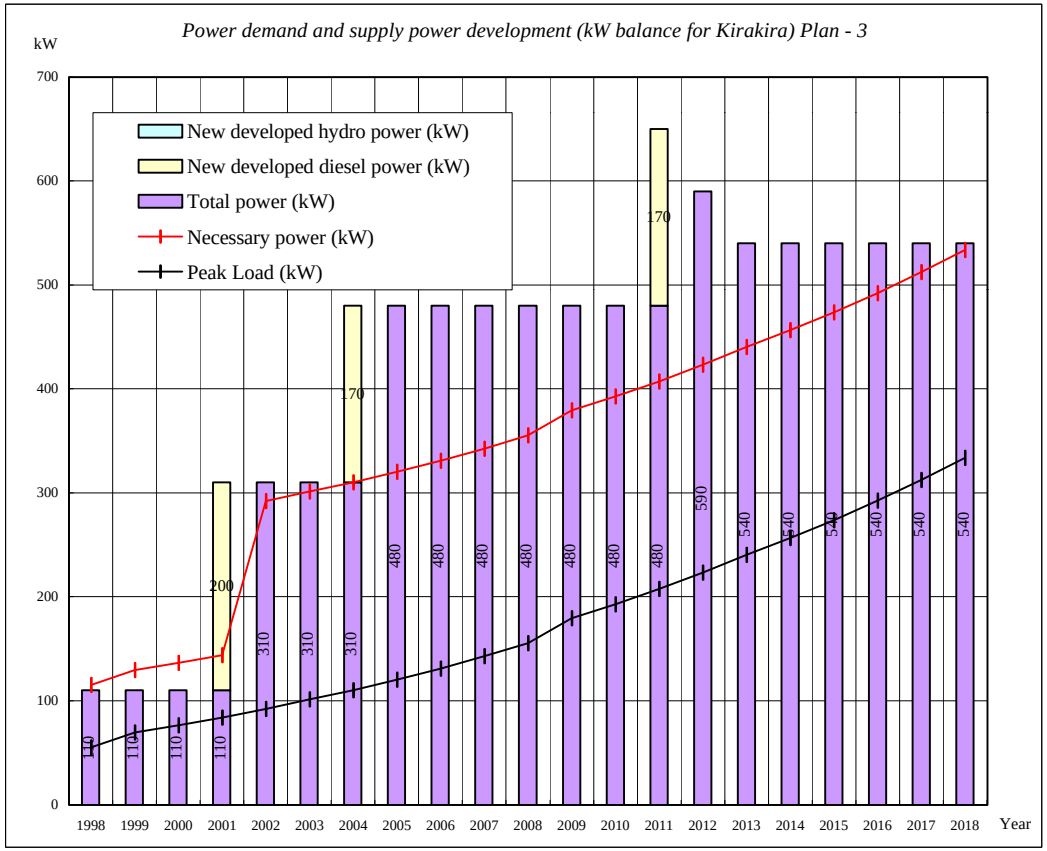
Appendix 10-3-42 Power demand and power supply development (Kirakira) Plan-2

Name of new power / Plan 2 / Year		Kirakira DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	110	0	110	0	0	55	115
	1999	110	0	110	0	0	69	129
	2000	110	0	110	0	0	76	136
New diesel No.4 install	2001	110	0	110	200	0	84	144
	2002	310	0	310	0	0	92	292
	2003	310	0	310	0	0	101	301
Huro hydro develop	2004	310	0	310	0	120	110	310
	2005	310	120	430	0	0	120	320
	2006	310	120	430	0	0	131	331
	2007	310	120	430	0	0	143	343
	2008	310	120	430	0	0	155	355
	2009	310	120	430	0	0	179	379
	2010	310	120	430	0	0	193	393
New diesel No.5 install	2011	310	120	430	240	0	207	407
Existing diesel No.1 retired	2012	490	120	610	0	0	223	423
Existing diesel No.2 retired	2013	440	120	560	0	0	240	440
	2014	440	120	560	0	0	256	456
	2015	440	120	560	0	0	274	474
	2016	440	120	560	0	0	292	492
	2017	440	120	560	0	0	312	512
	2018	440	120	560	0	0	334	534



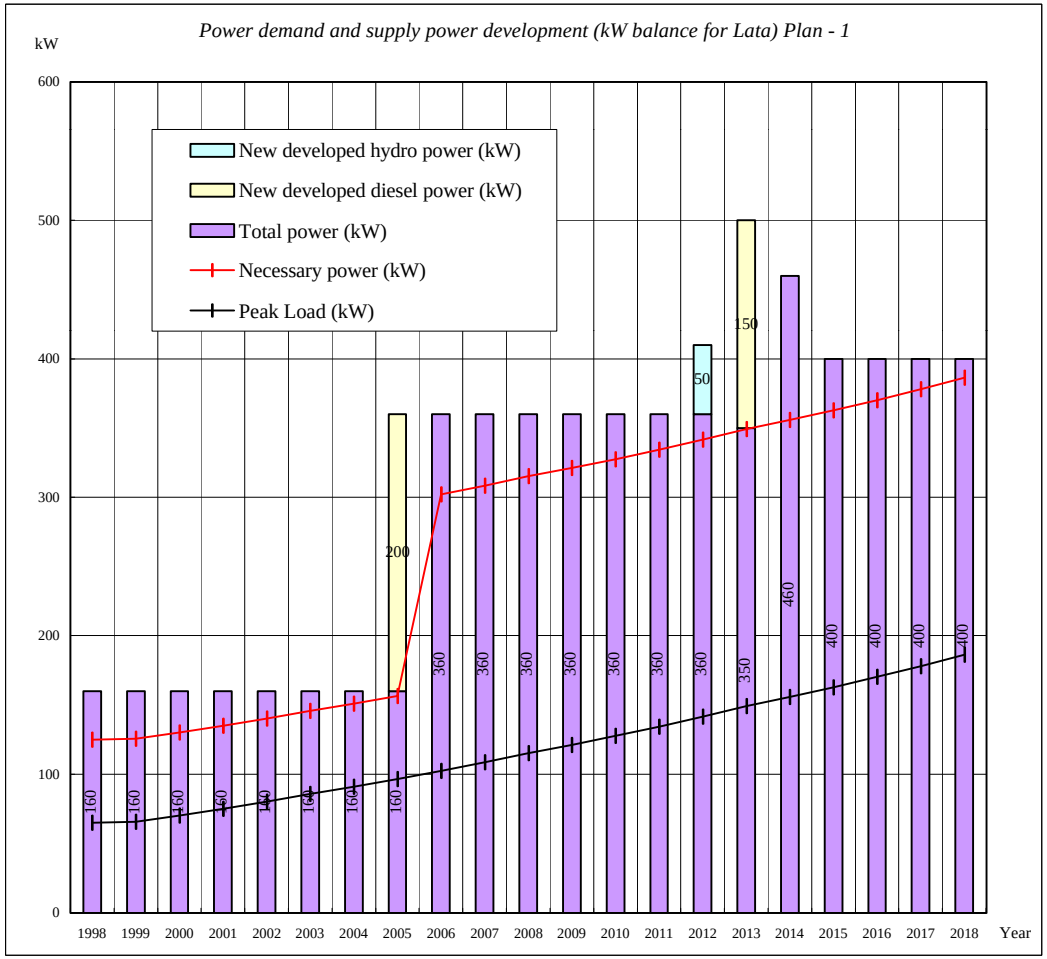
Appendix 10-3-43 Power demand and power supply development (Kirakira) Plan-3

Name of new power / Plan 3 / Year		Kirakira DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	110	0	110	0	0	55	115
	1999	110	0	110	0	0	69	129
	2000	110	0	110	0	0	76	136
New diesel No.4 install	2001	110	0	110	200	0	84	144
	2002	310	0	310	0	0	92	292
	2003	310	0	310	0	0	101	301
New diesel No.5	2004	310	0	310	170	0	110	310
	2005	480	0	480	0	0	120	320
	2006	480	0	480	0	0	131	331
	2007	480	0	480	0	0	143	343
	2008	480	0	480	0	0	155	355
	2009	480	0	480	0	0	179	379
	2010	480	0	480	0	0	193	393
New diesel No.6 install	2011	480	0	480	170	0	207	407
Existing diesel No.1 retired	2012	590	0	590	0	0	223	423
Existing diesel No.2 retired	2013	540	0	540	0	0	240	440
	2014	540	0	540	0	0	256	456
	2015	540	0	540	0	0	274	474
	2016	540	0	540	0	0	292	492
	2017	540	0	540	0	0	312	512
	2018	540	0	540	0	0	334	534



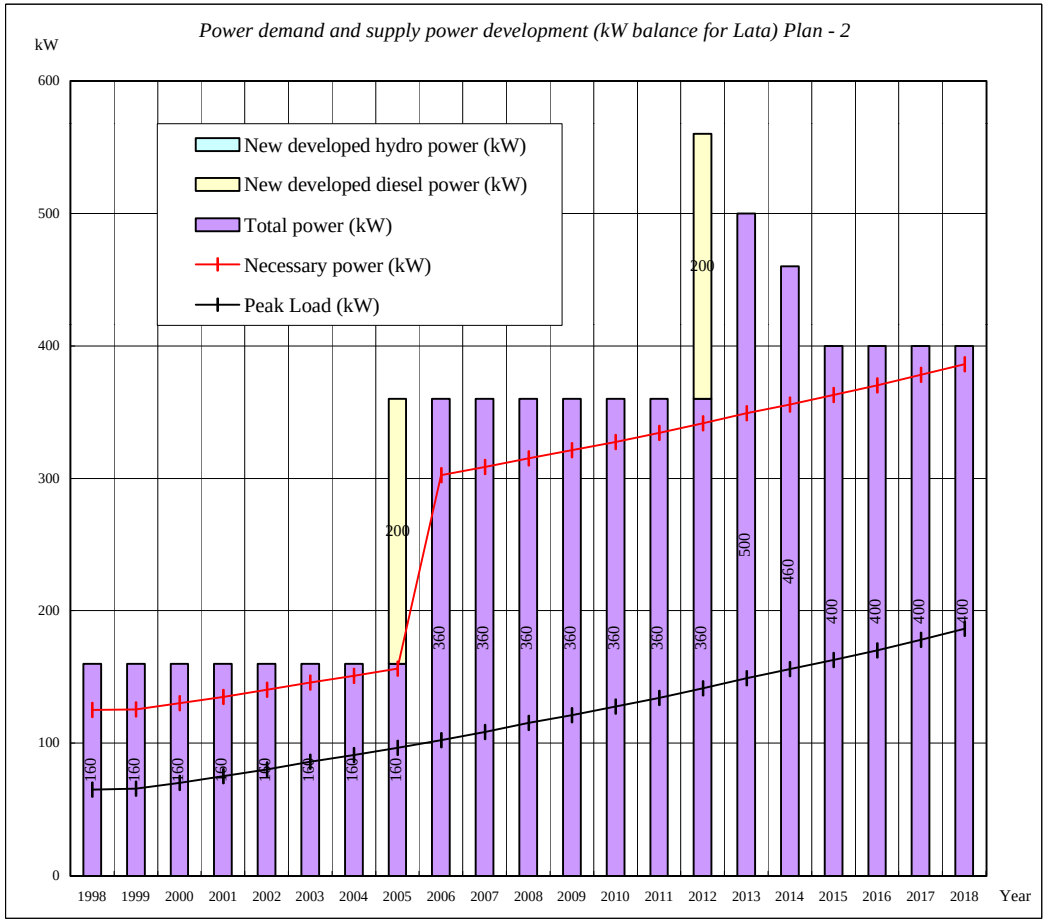
Appendix 10-3-51 Power demand and power supply development (Lata) Plan-1

Name of new power / **Plan 1** / Year	Lata DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	160	0	160	0	0	65	125
	1999	160	0	160	0	0	66	126
	2000	160	0	160	0	0	70	130
	2001	160	0	160	0	0	75	135
	2002	160	0	160	0	0	80	140
	2003	160	0	160	0	0	86	146
	2004	160	0	160	0	0	91	151
New diesel No.4	2005	160	0	160	200	0	96	156
	2006	360	0	360	0	0	102	302
	2007	360	0	360	0	0	108	308
	2008	360	0	360	0	0	115	315
	2009	360	0	360	0	0	121	321
	2010	360	0	360	0	0	128	328
	2011	360	0	360	0	0	134	334
Luembalele hydro develop	2012	360	0	360	0	50	141	341
New diesel No.5 (150kW) install and existing diesel No.1 retired	2013	300	50	350	150	0	149	349
Existing diesel No.2 retired	2014	410	50	460	0	0	156	356
Existing diesel No.3 retired	2015	350	50	400	0	0	163	363
	2016	350	50	400	0	0	170	370
	2017	350	50	400	0	0	178	378
	2018	350	50	400	0	0	186	386



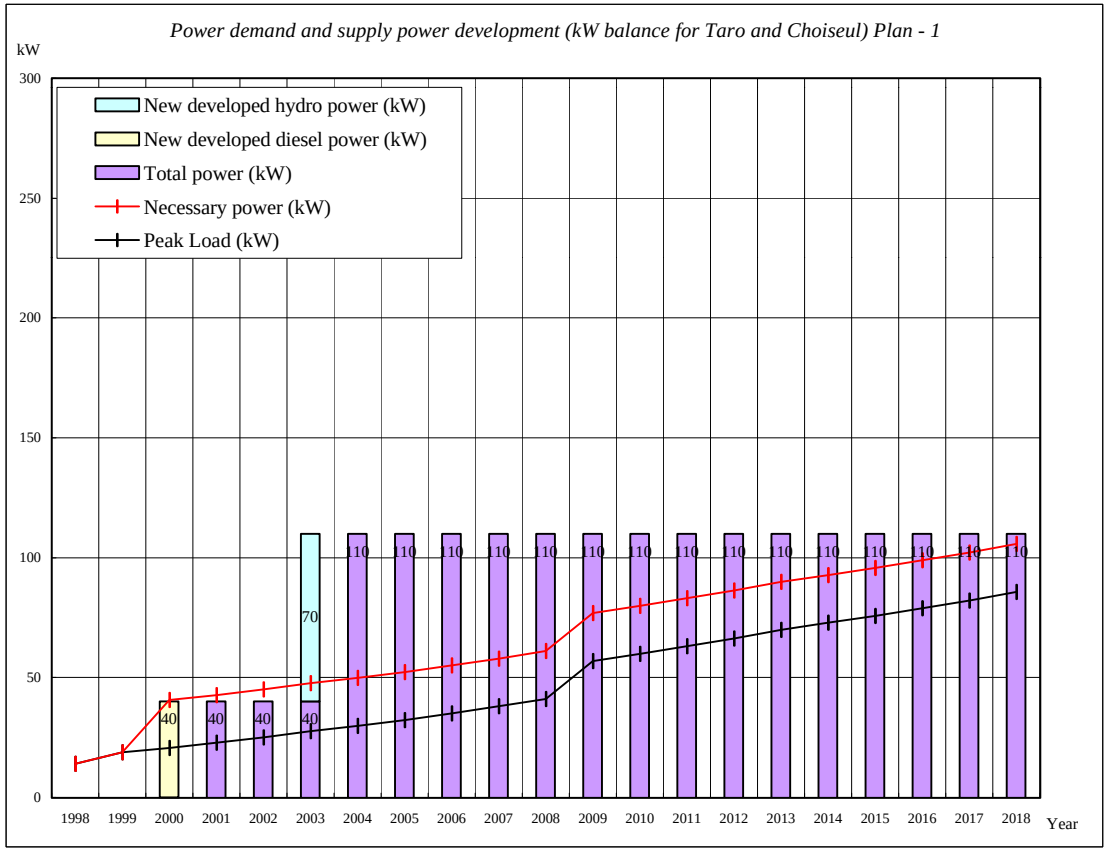
Appendix 10-3-52 Power demand and power supply development (Lata) Plan-2

Name of new power / **Plan 2** / Year		Lata DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	160	0	160	0	0	65	125
	1999	160	0	160	0	0	66	126
	2000	160	0	160	0	0	70	130
	2001	160	0	160	0	0	75	135
	2002	160	0	160	0	0	80	140
	2003	160	0	160	0	0	86	146
	2004	160	0	160	0	0	91	151
New diesel No.4	2005	160	0	160	200	0	96	156
	2006	360	0	360	0	0	102	302
	2007	360	0	360	0	0	108	308
	2008	360	0	360	0	0	115	315
	2009	360	0	360	0	0	121	321
	2010	360	0	360	0	0	128	328
	2011	360	0	360	0	0	134	334
New diesel No.5 develop	2012	360	0	360	200	0	141	341
Existing diesel No.1 retired	2013	500	0	500	0	0	149	349
Existing diesel No.2 retired	2014	460	0	460	0	0	156	356
Existing diesel No.3 retired	2015	400	0	400	0	0	163	363
	2016	400	0	400	0	0	170	370
	2017	400	0	400	0	0	178	378
	2018	400	0	400	0	0	186	386



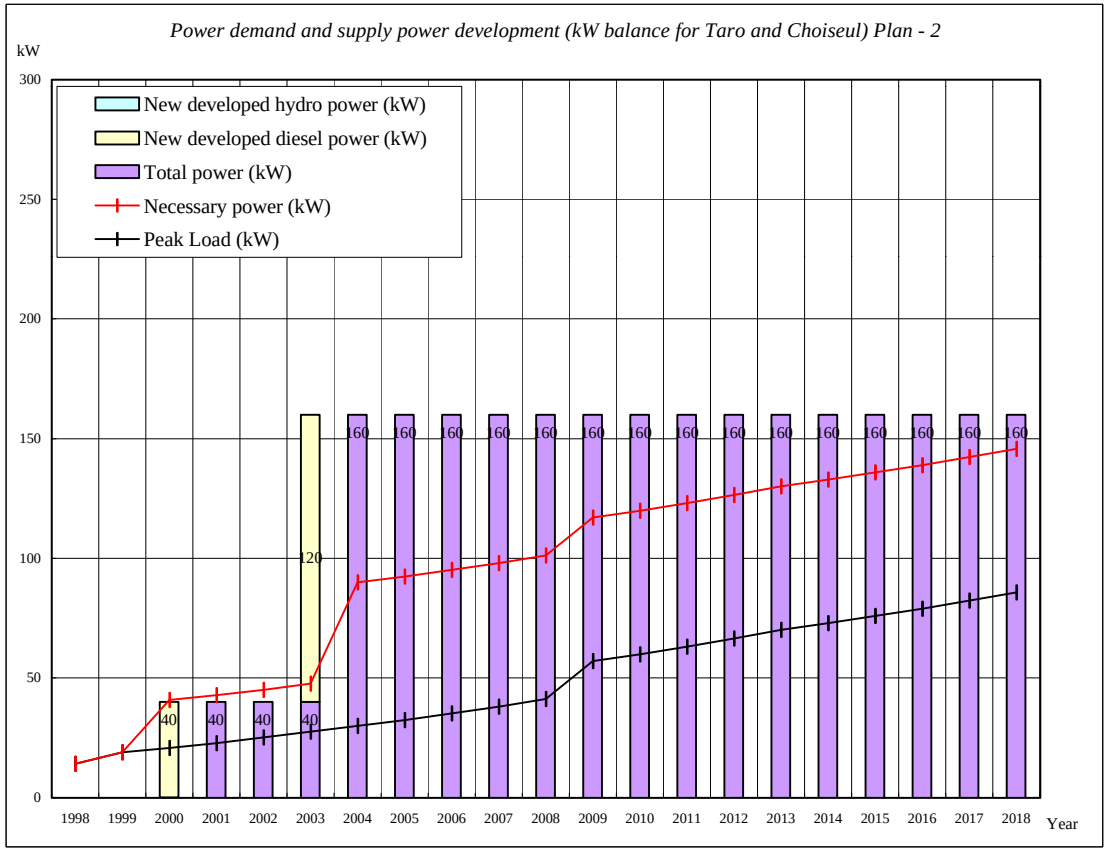
Appendix 10-3-61 Power demand and power supply development (Choiseul) Plan-1

Name of new power / Year — **Plan 1**	Year	Taro DPS (kW)	Choiseul Is PS (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	0	0	0	0	0	14	14
	1999	0	0	0	0	0	19	19
Diesel developed in Taro Is.	2000	0	0	0	40	0	21	41
	2001	40	0	40	0	0	23	43
	2002	40	0	40	0	0	25	45
Sorave hydro develop	2003	40	0	40	0	70	28	48
	2004	40	70	110	0	0	30	50
	2005	40	70	110	0	0	32	52
	2006	40	70	110	0	0	35	55
	2007	40	70	110	0	0	38	58
	2008	40	70	110	0	0	41	61
	2009	40	70	110	0	0	57	77
	2010	40	70	110	0	0	60	80
	2011	40	70	110	0	0	63	83
	2012	40	70	110	0	0	66	86
	2013	40	70	110	0	0	70	90
	2014	40	70	110	0	0	73	93
	2015	40	70	110	0	0	76	96
	2016	40	70	110	0	0	79	99
	2017	40	70	110	0	0	82	102
	2018	40	70	110	0	0	86	106



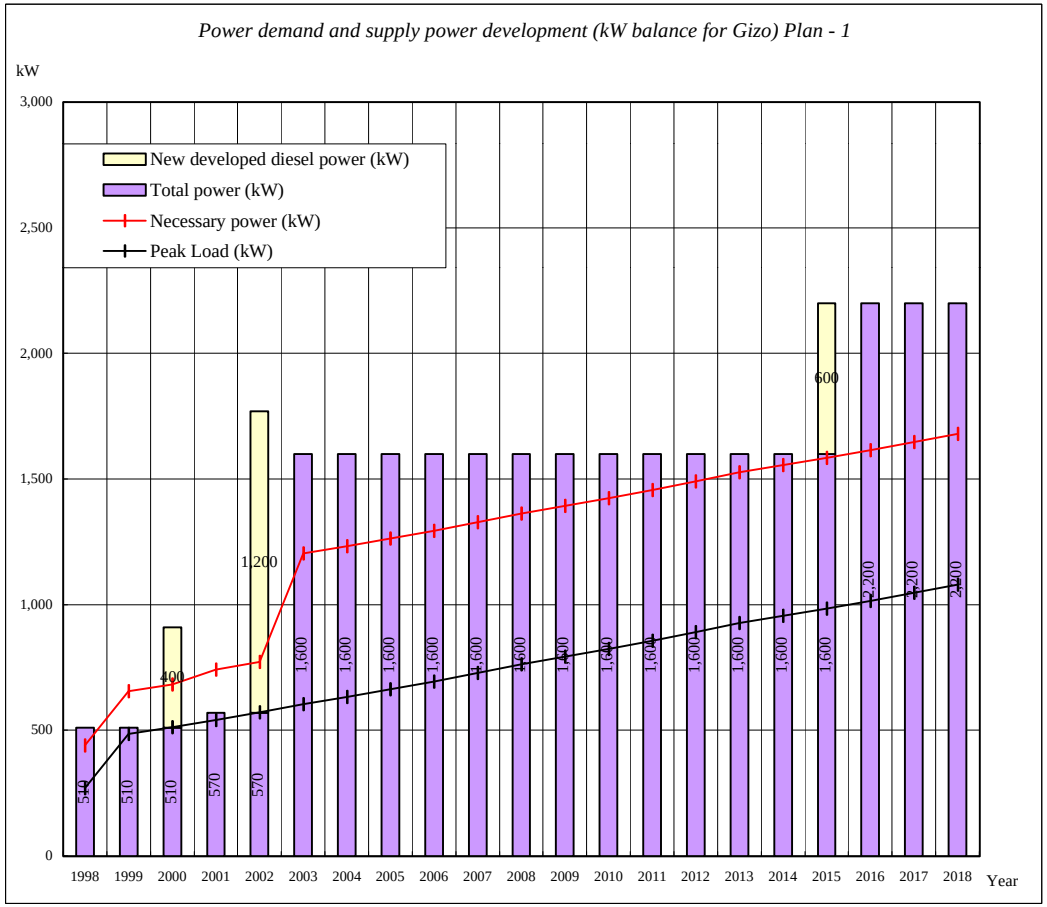
Appendix 10-3-62 Power demand and power supply development (Choiseul) Plan-2

Name of new power / Year — **Plan 2**	Year	Taro DPS (kW)	Choiseul Is PS (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	0	0	0	0	0	14	14
	1999	0	0	0	0	0	19	19
Diesel developed in Taro Is.	2000	0	0	0	40	0	21	41
	2001	40	0	40	0	0	23	43
	2002	40	0	40	0	0	25	45
Diesel develop in Main Is.	2003	40	0	40	120	0	28	48
	2004	160	0	160	0	0	30	90
	2005	160	0	160	0	0	32	92
	2006	160	0	160	0	0	35	95
	2007	160	0	160	0	0	38	98
	2008	160	0	160	0	0	41	101
	2009	160	0	160	0	0	57	117
	2010	160	0	160	0	0	60	120
	2011	160	0	160	0	0	63	123
	2012	160	0	160	0	0	66	126
	2013	160	0	160	0	0	70	130
	2014	160	0	160	0	0	73	133
	2015	160	0	160	0	0	76	136
	2016	160	0	160	0	0	79	139
	2017	160	0	160	0	0	82	142
	2018	160	0	160	0	0	86	146



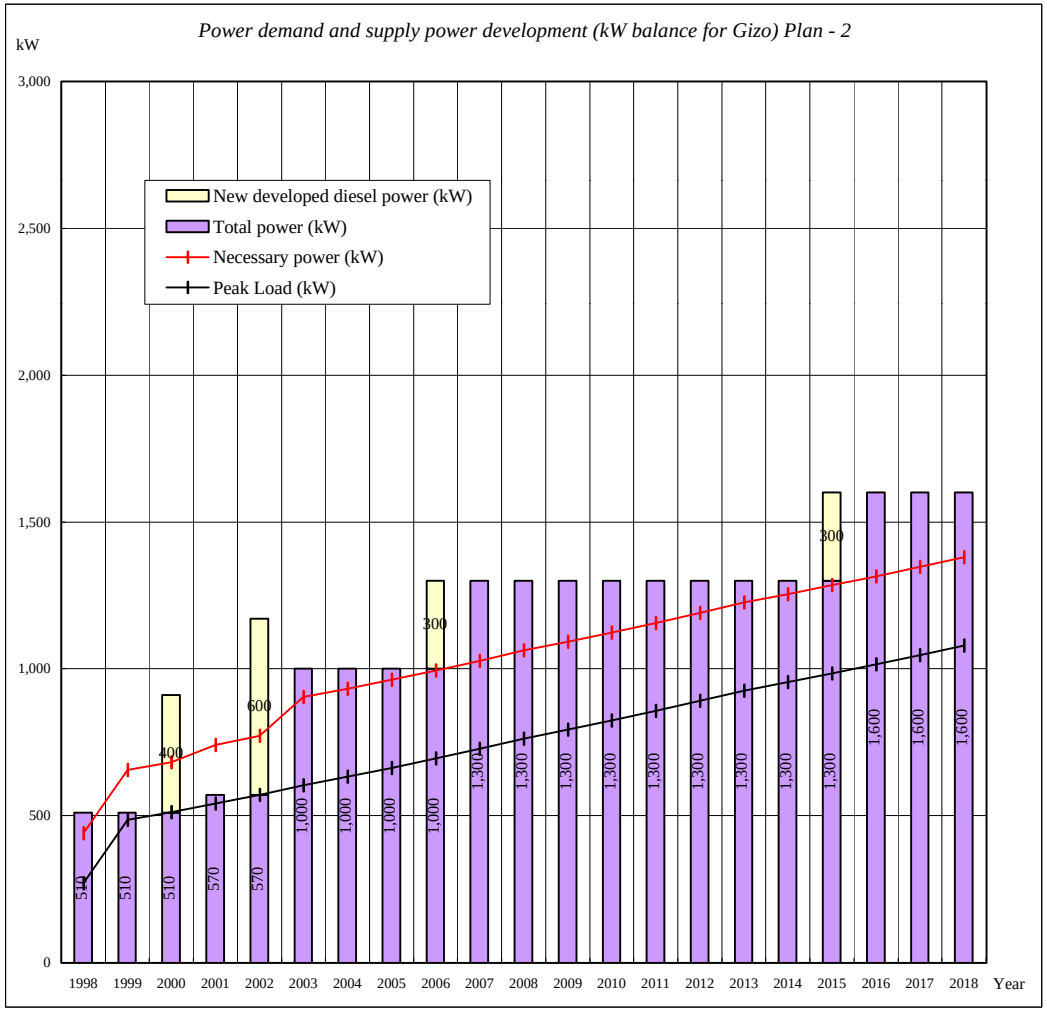
Appendix 10-3-71 Power demand and power supply development (Gizo) Plan-1

Name of new power / **Plan 1** Year		Gizo DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	510	0	510	0	0	270	440
	1999	510	0	510	0	0	485	655
Gizo diesel 2 units (200kW*2) replacement	2000	510	0	510	400	0	512	682
	2001	570	0	570	0	0	541	741
New diesel No.4 & 5 (600kW*2) install	2002	570	0	570	1,200	0	571	771
Existing diesel No.3 retired	2003	1,600	0	1,600	0	0	603	1,203
	2004	1,600	0	1,600	0	0	632	1,232
	2005	1,600	0	1,600	0	0	662	1,262
	2006	1,600	0	1,600	0	0	694	1,294
	2007	1,600	0	1,600	0	0	727	1,327
	2008	1,600	0	1,600	0	0	763	1,363
	2009	1,600	0	1,600	0	0	793	1,393
	2010	1,600	0	1,600	0	0	824	1,424
	2011	1,600	0	1,600	0	0	856	1,456
	2012	1,600	0	1,600	0	0	891	1,491
	2013	1,600	0	1,600	0	0	926	1,526
	2014	1,600	0	1,600	0	0	955	1,555
New diesel No.6 (600kW) install	2015	1,600	0	1,600	600	0	984	1,584
	2016	2,200	0	2,200	0	0	1,015	1,615
	2017	2,200	0	2,200	0	0	1,046	1,646
	2018	2,200	0	2,200	0	0	1,079	1,679



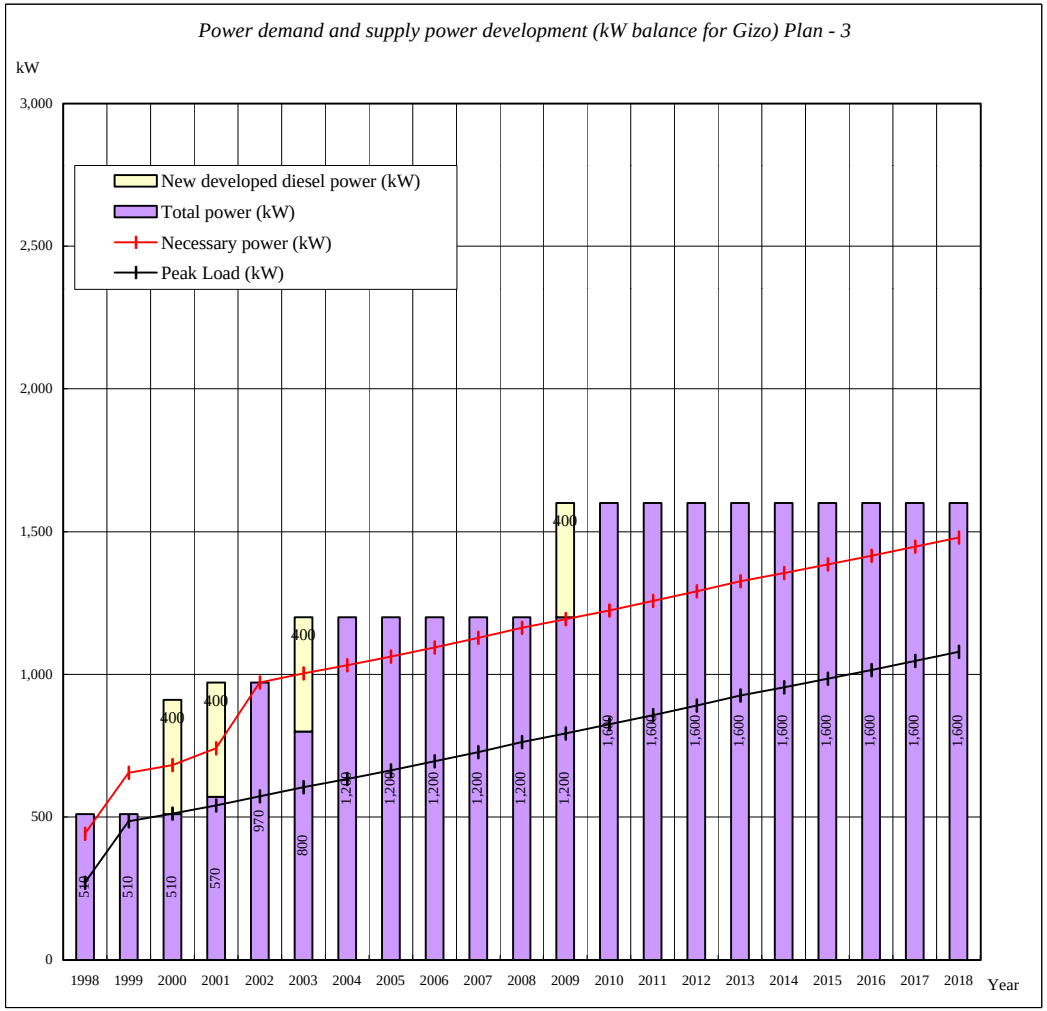
Appendix 10-3-72 Power demand and power supply development (Gizo) Plan-2

Name of new power / Plan 2 / Year	Year	Gizo DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	510	0	510	0	0	270	440
	1999	510	0	510	0	0	485	655
Gizo diesel 2 units (200kW*2) replacement	2000	510	0	510	400	0	512	682
	2001	570	0	570	0	0	541	741
New diesel No.4 & 5 (300kW*2) install	2002	570	0	570	600	0	571	771
Existing diesel No.3 retired	2003	1,000	0	1,000	0	0	603	903
	2004	1,000	0	1,000	0	0	632	932
	2005	1,000	0	1,000	0	0	662	962
New diesel No.6 (300kW) install	2006	1,000	0	1,000	300	0	694	994
	2007	1,300	0	1,300	0	0	727	1,027
	2008	1,300	0	1,300	0	0	763	1,063
	2009	1,300	0	1,300	0	0	793	1,093
	2010	1,300	0	1,300	0	0	824	1,124
	2011	1,300	0	1,300	0	0	856	1,156
	2012	1,300	0	1,300	0	0	891	1,191
	2013	1,300	0	1,300	0	0	926	1,226
	2014	1,300	0	1,300	0	0	955	1,255
New diesel No.7 (300kW) install	2015	1,300	0	1,300	300	0	984	1,284
	2016	1,600	0	1,600	0	0	1,015	1,315
	2017	1,600	0	1,600	0	0	1,046	1,346
	2018	1,600	0	1,600	0	0	1,079	1,379



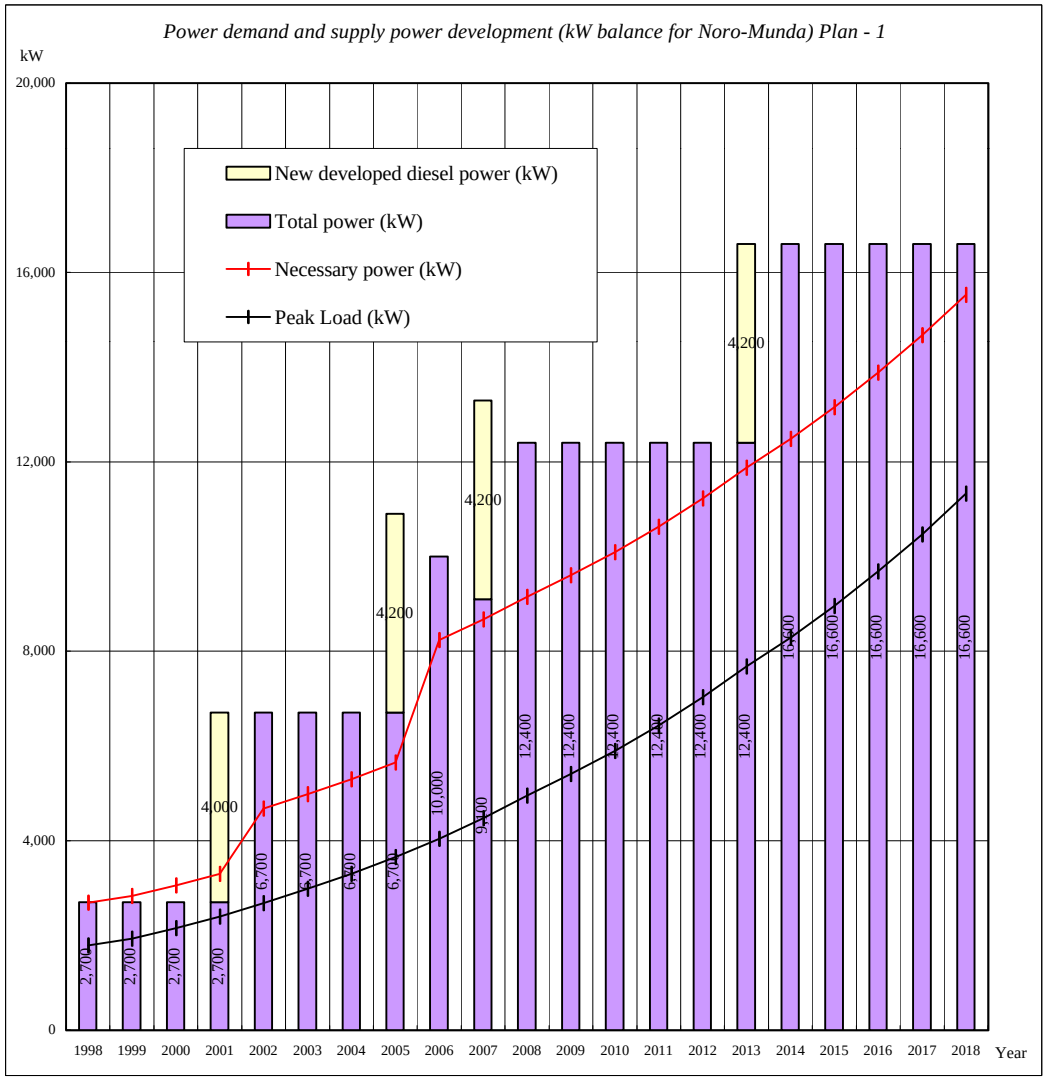
Appendix 10-3-73 Power demand and power supply development (Gizo) Plan-3

Name of new power / Plan 3 / Year		Gizo DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	510	0	510	0	0	270	440
	1999	510	0	510	0	0	485	655
Gizo diesel 2 units (200kW*2) replacement	2000	510	0	510	400	0	512	682
New diesel No.4 (400kW) install	2001	570	0	570	400	0	541	741
	2002	970	0	970	0	0	571	971
New diesel No.5 (400kW) install and existing diesel No.3 retired	2003	800	0	800	400	0	603	1,003
	2004	1,200	0	1,200	0	0	632	1,032
	2005	1,200	0	1,200	0	0	662	1,062
	2006	1,200	0	1,200	0	0	694	1,094
	2007	1,200	0	1,200	0	0	727	1,127
	2008	1,200	0	1,200	0	0	763	1,163
New diesel No.6 (400kW) install	2009	1,200	0	1,200	400	0	793	1,193
	2010	1,600	0	1,600	0	0	824	1,224
	2011	1,600	0	1,600	0	0	856	1,256
	2012	1,600	0	1,600	0	0	891	1,291
	2013	1,600	0	1,600	0	0	926	1,326
	2014	1,600	0	1,600	0	0	955	1,355
	2015	1,600	0	1,600	0	0	984	1,384
	2016	1,600	0	1,600	0	0	1,015	1,415
	2017	1,600	0	1,600	0	0	1,046	1,446
	2018	1,600	0	1,600	0	0	1,079	1,479



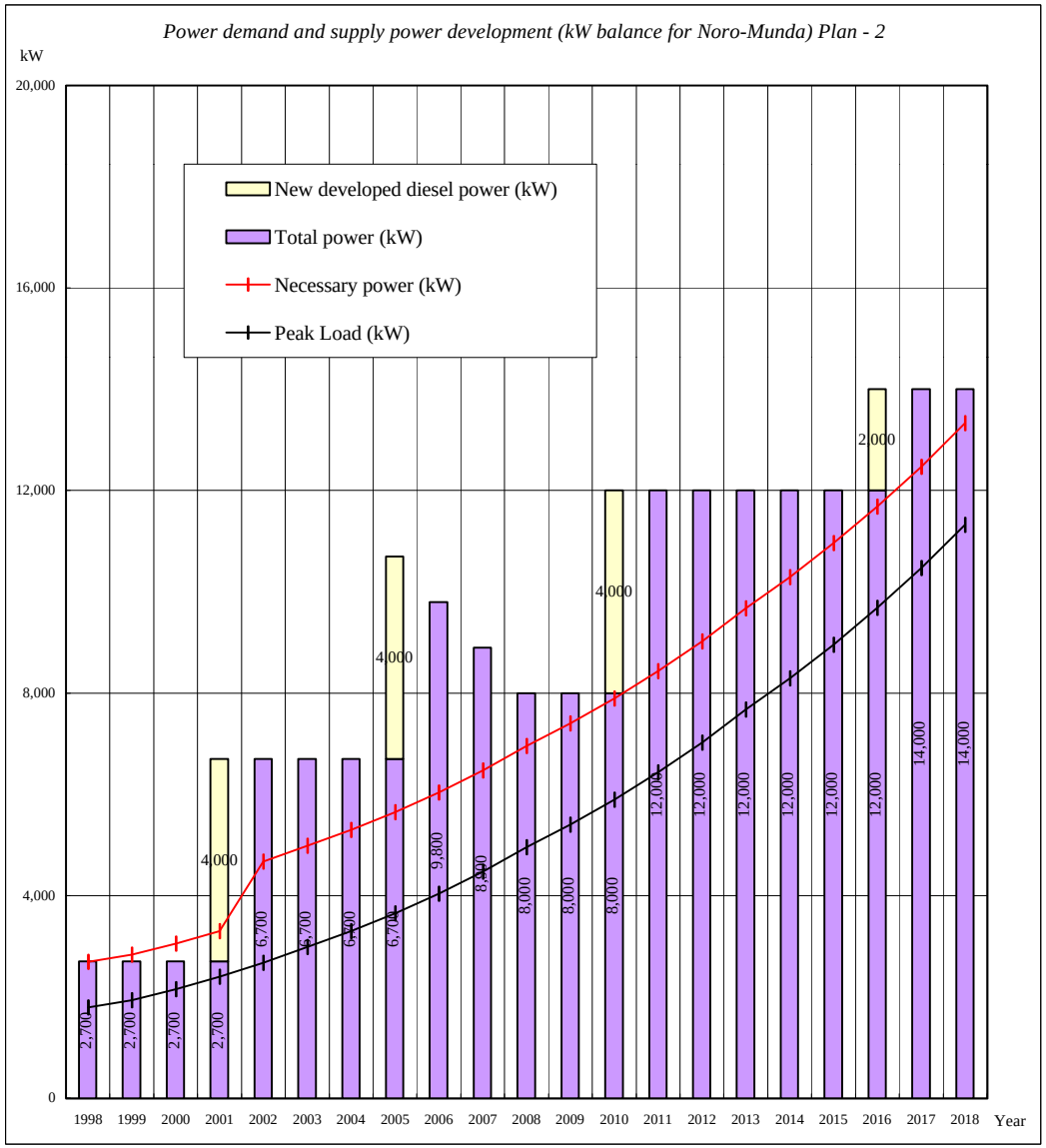
Appendix 10-3-74 Power demand and power supply development (Noro-Munda) Plan-1

Name of new power / Plan 1 / Year		Noro DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	2,700	0	2,700	0	0	1,790	2,690
	1999	2,700	0	2,700	0	0	1,930	2,830
	2000	2,700	0	2,700	0	0	2,150	3,050
Diesel extension No.4 & 5 (2000kW*2)	2001	2,700	0	2,700	4,000	0	2,397	3,297
	2002	6,700	0	6,700	0	0	2,673	4,673
	2003	6,700	0	6,700	0	0	2,983	4,983
	2004	6,700	0	6,700	0	0	3,297	5,297
Diesel extension No.6 (4200kW*1)	2005	6,700	0	6,700	4,200	0	3,647	5,647
Existing diesel No.1 retired	2006	10,000	0	10,000	0	0	4,036	8,236
New diesel No. 7 (4200kW) install and existing diesel No.2 retired	2007	9,100	0	9,100	4,200	0	4,469	8,669
Existing diesel No.3 retired	2008	12,400	0	12,400	0	0	4,951	9,151
	2009	12,400	0	12,400	0	0	5,401	9,601
	2010	12,400	0	12,400	0	0	5,893	10,093
	2011	12,400	0	12,400	0	0	6,433	10,633
	2012	12,400	0	12,400	0	0	7,024	11,224
Diesel extension No.8 (4200kW*1)	2013	12,400	0	12,400	4,200	0	7,673	11,873
	2014	16,600	0	16,600	0	0	8,289	12,489
	2015	16,600	0	16,600	0	0	8,957	13,157
	2016	16,600	0	16,600	0	0	9,683	13,883
	2017	16,600	0	16,600	0	0	10,470	14,670
	2018	16,600	0	16,600	0	0	11,326	15,526



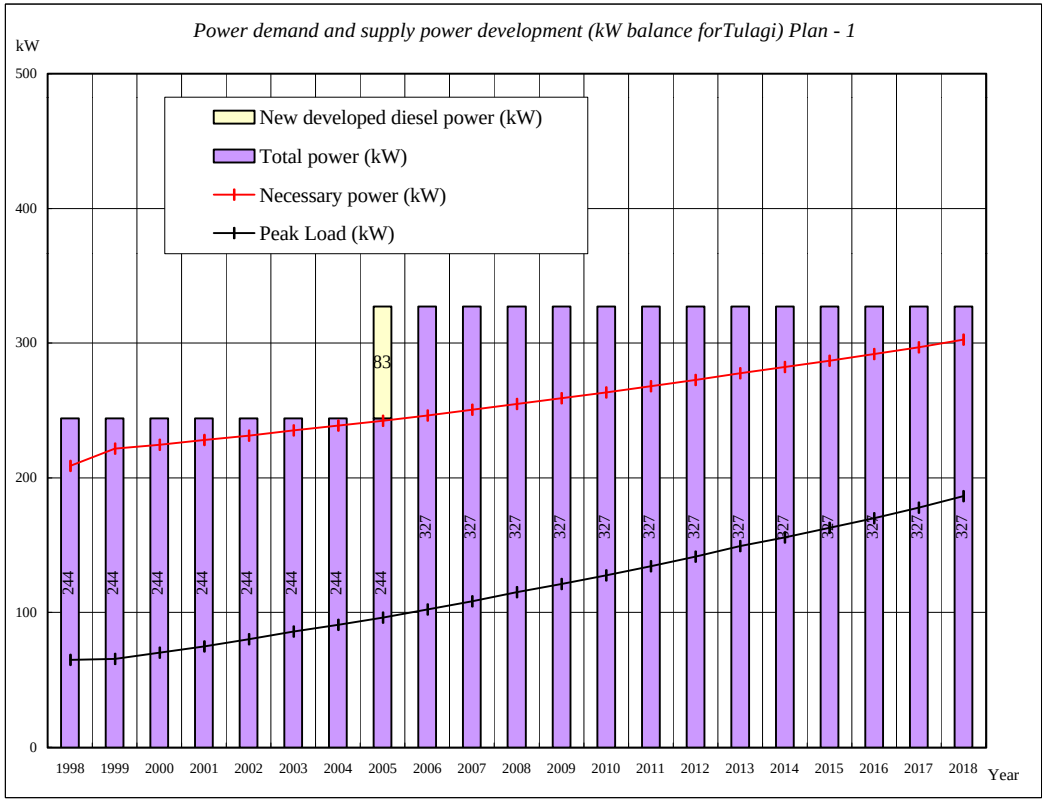
Appendix 10-3-75 Power demand and power supply development (Noro-Munda) Plan-2

Name of new power / Plan 2 / Year		Noro DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	2,700	0	2,700	0	0	1,790	2,690
	1999	2,700	0	2,700	0	0	1,930	2,830
	2000	2,700	0	2,700	0	0	2,150	3,050
Diesel extension No.4 & 5 (2000kW*2)	2001	2,700	0	2,700	4,000	0	2,397	3,297
	2002	6,700	0	6,700	0	0	2,673	4,673
	2003	6,700	0	6,700	0	0	2,983	4,983
	2004	6,700	0	6,700	0	0	3,297	5,297
Diesel extension No.6 & No.7 (2000kW*2)	2005	6,700	0	6,700	4,000	0	3,647	5,647
Existing diesel No.1 retired	2006	9,800	0	9,800	0	0	4,036	6,036
Existing diesel No.2 retired	2007	8,900	0	8,900	0	0	4,469	6,469
Existing diesel No.3 retired	2008	8,000	0	8,000	0	0	4,951	6,951
	2009	8,000	0	8,000	0	0	5,401	7,401
New diesel No. 8 & No.9 (2000kW*2) install	2010	8,000	0	8,000	4,000	0	5,893	7,893
	2011	12,000	0	12,000	0	0	6,433	8,433
	2012	12,000	0	12,000	0	0	7,024	9,024
	2013	12,000	0	12,000	0	0	7,673	9,673
	2014	12,000	0	12,000	0	0	8,289	10,289
	2015	12,000	0	12,000	0	0	8,957	10,957
Diesel extension No.10 (2000kW*1)	2016	12,000	0	12,000	2,000	0	9,683	11,683
	2017	14,000	0	14,000	0	0	10,470	12,470
	2018	14,000	0	14,000	0	0	11,326	13,326



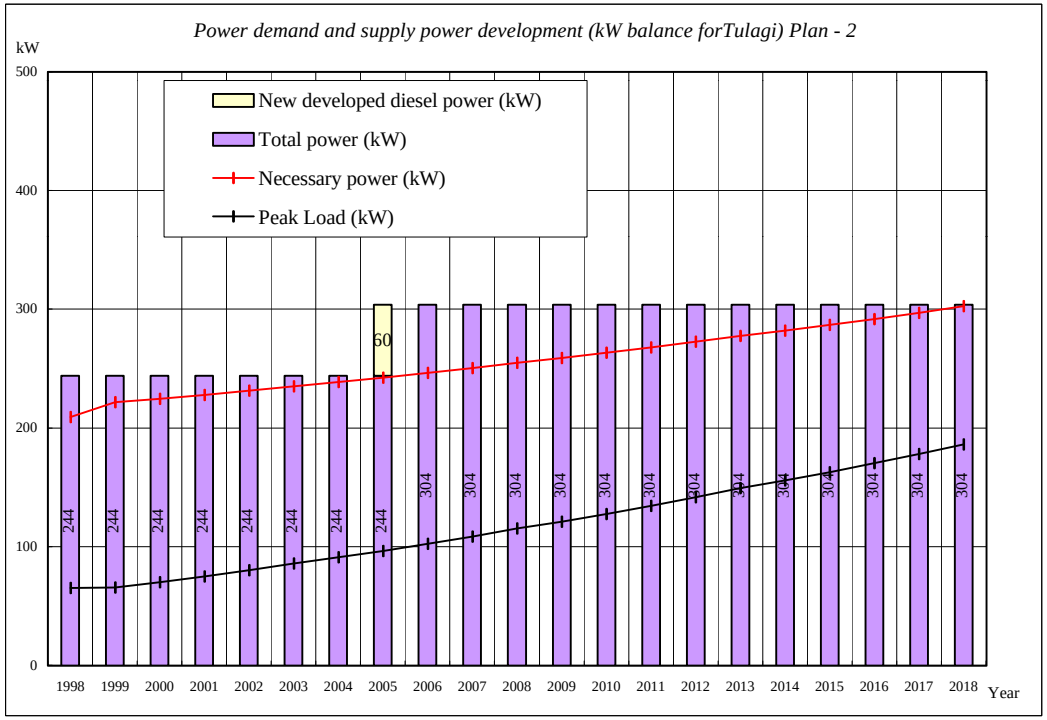
Appendix 10-3-81　Power demand and power supply development (Tulagi) Plan-1

Name of new power / Plan 1 / Year		Tulagi DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	244	0	244	0	0	65	209
	1999	244	0	244	0	0	66	221
	2000	244	0	244	0	0	70	225
	2001	244	0	244	0	0	75	228
	2002	244	0	244	0	0	80	231
	2003	244	0	244	0	0	86	235
	2004	244	0	244	0	0	91	239
New diesel No.3	2005	244	0	244	83	0	96	242
	2006	327	0	327	0	0	102	246
	2007	327	0	327	0	0	108	251
	2008	327	0	327	0	0	115	255
	2009	327	0	327	0	0	121	259
	2010	327	0	327	0	0	128	263
	2011	327	0	327	0	0	134	268
	2012	327	0	327	0	0	141	273
	2013	327	0	327	0	0	149	278
	2014	327	0	327	0	0	156	282
	2015	327	0	327	0	0	163	287
	2016	327	0	327	0	0	170	292
	2017	327	0	327	0	0	178	297
	2018	327	0	327	0	0	186	303



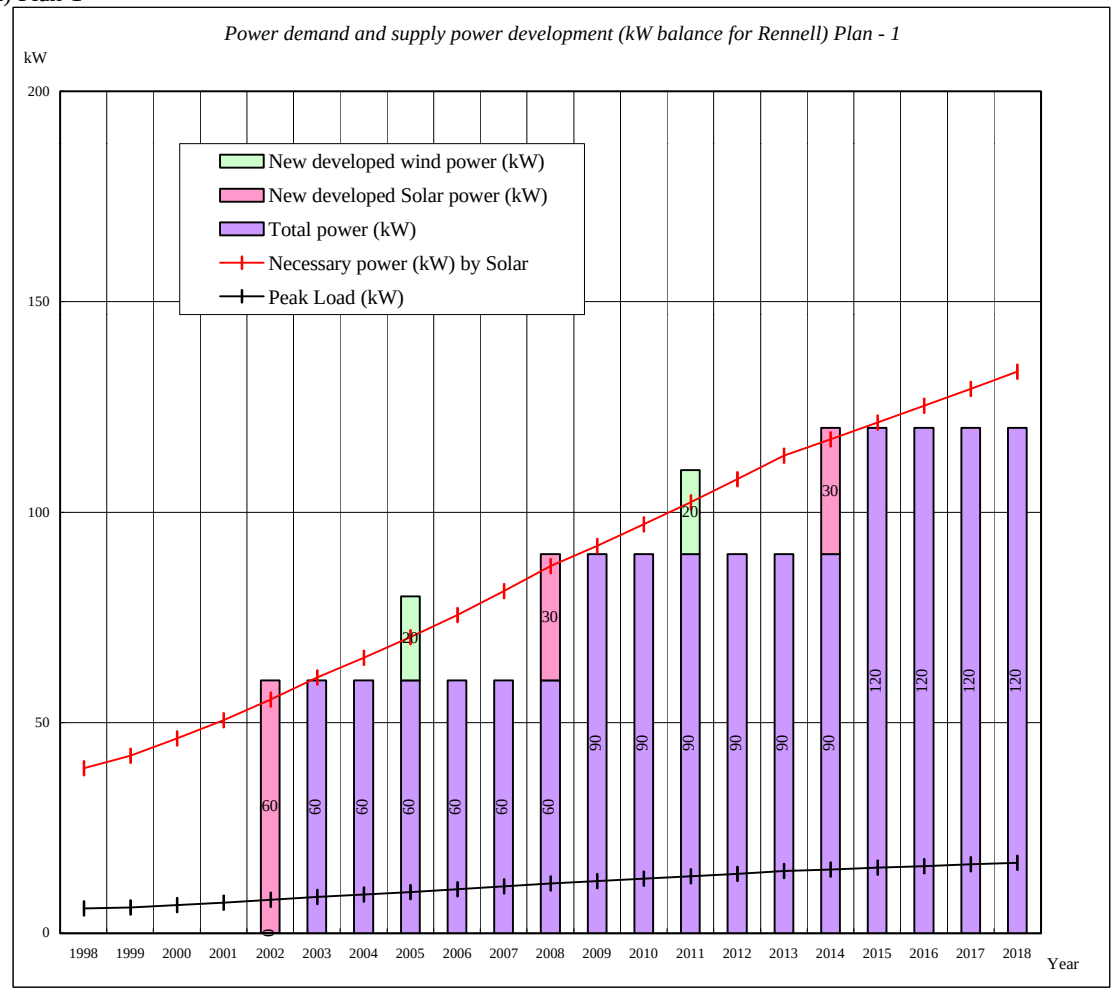
Appendix 10-3-82 Power demand and power supply development (Tulagi) Plan-2

Name of new power / Plan 2 / Year		Tulagi DPS (kW)	Hydro power (kW)	Total power (kW)	New developed diesel power (kW)	New developed hydro power (kW)	Peak Load (kW)	Necessary power (kW)
	1998	244	0	244	0	0	65	209
	1999	244	0	244	0	0	66	221
	2000	244	0	244	0	0	70	225
	2001	244	0	244	0	0	75	228
	2002	244	0	244	0	0	80	231
	2003	244	0	244	0	0	86	235
	2004	244	0	244	0	0	91	239
New diesel No.3	2005	244	0	244	60	0	96	242
	2006	304	0	304	0	0	102	246
	2007	304	0	304	0	0	108	251
	2008	304	0	304	0	0	115	255
	2009	304	0	304	0	0	121	259
	2010	304	0	304	0	0	128	263
	2011	304	0	304	0	0	134	268
	2012	304	0	304	0	0	141	273
	2013	304	0	304	0	0	149	278
	2014	304	0	304	0	0	156	282
	2015	304	0	304	0	0	163	287
	2016	304	0	304	0	0	170	292
	2017	304	0	304	0	0	178	297
	2018	304	0	304	0	0	186	303



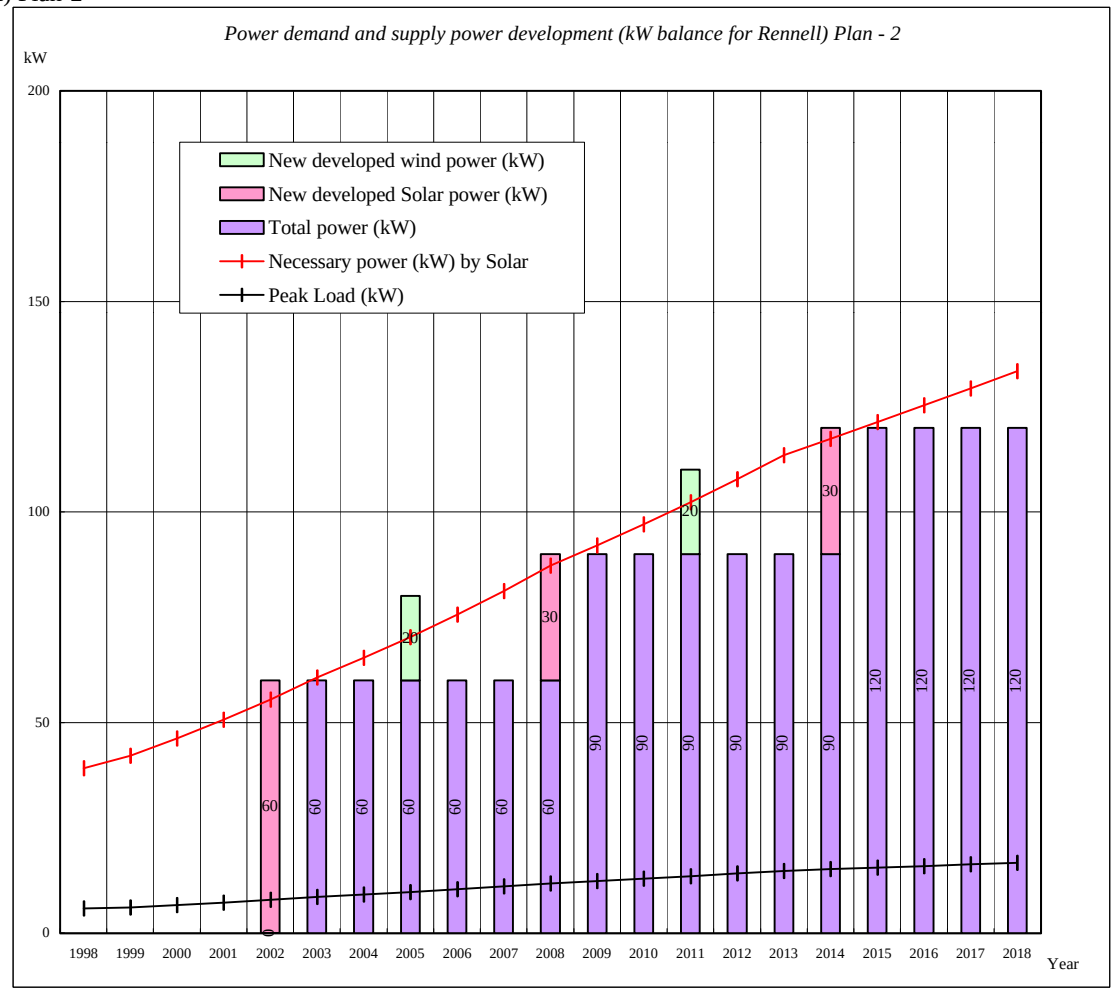
Appendix 10-3-91 Power demand and power supply development (Rennell and Bellona) Plan-1

Name of new power / Year (Plan 1)		Rennell Solar PS (kW)	Rennell Wind PS (kW)	Total power (kW)	New developed Solar power (kW)	New developed wind power (kW)	Peak Load (kW)	Necessary power (kW) by Solar
	1998	0	0	0	0	0	6	39
	1999	0	0	0	0	0	6	42
	2000	0	0	0	0	0	7	46
	2001	0	0	0	0	0	7	51
Solar generation (30kW*2) developed	2002	0	0	0	60	0	8	55
	2003	60	0	60	0	0	9	61
	2004	60	0	60	0	0	9	65
Wind power (20kW*1) develop	2005	60	0	60	0	20	10	70
	2006	60	20	60	0	0	10	76
	2007	60	20	60	0	0	11	81
Solar generation (30kW*1) extend	2008	60	20	60	30	0	12	87
	2009	90	20	90	0	0	12	92
	2010	90	20	90	0	0	13	97
Wind power (20kW*1) extend	2011	90	20	90	0	20	13	102
	2012	90	40	90	0	0	14	108
	2013	90	40	90	0	0	15	113
Solar generation (30kW*1) extend	2014	90	40	90	30	0	15	117
	2015	120	40	120	0	0	16	121
	2016	120	40	120	0	0	16	125
	2017	120	40	120	0	0	16	129
	2018	120	40	120	0	0	17	133



Appendix 10-3-92 Power demand and power supply development (Rennell and Bellona) Plan-2

Name of new power / Year	Plan 2	Rennell Solar PS (kW)	Rennell Wind PS (kW)	Total power (kW)	New developed Solar power (kW)	New developed wind power (kW)	Peak Load (kW)	Necessary power (kW) by Solar
	1998	0	0	0	0	0	6	39
	1999	0	0	0	0	0	6	42
	2000	0	0	0	0	0	7	46
	2001	0	0	0	0	0	7	51
Solar generation (20kW*3) developed	2002	0	0	0	60	0	8	55
	2003	60	0	60	0	0	9	61
	2004	60	0	60	0	0	9	65
Wind power (20kW*1) develop	2005	60	0	60	0	20	10	70
	2006	60	20	60	0	0	10	76
	2007	60	20	60	0	0	11	81
Solar generation (15kW*2) extend	2008	60	20	60	30	0	12	87
	2009	90	20	90	0	0	12	92
	2010	90	20	90	0	0	13	97
Wind power (20kW*1) extend	2011	90	20	90	0	20	13	102
	2012	90	40	90	0	0	14	108
	2013	90	40	90	0	0	15	113
Solar generation (15kW*2) extend	2014	90	40	90	30	0	15	117
	2015	120	40	120	0	0	16	121
	2016	120	40	120	0	0	16	125
	2017	120	40	120	0	0	16	129
	2018	120	40	120	0	0	17	133



第１２章　　経済・財務分析

Appendix 12-1-1 LRAIC and LRMC for the Master Plan

Year	Peak Demand (kW)	Incremental Demand (kW)	Retire (kW)	New Capacity (kW)	H-3 (US$)	A-3 (US$)	B-1 (US$)	K-2 (US$)	L-2 (US$)	C-1 (US$)	G-2 (US$)	N-2 (US$)	T-2 (US$)	Total (US$)
1998	12,983	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	13,573	591	3000	3,900	0	0	0	0	0	0	0	0	0	0
2000	14,400	827	0	4,723	6,442,800	149,400	0	0	0	206,960	800,000	0	0	7,599,160
2001	15,277	877	416	5,700	0	7,277,254	0	413,000	0	0	0	7,200,000	0	14,890,254
2002	16,207	930	208	2,100	0	3,916,738	0	1,144,017	0	1,798,469	1,200,000	0	0	8,059,224
2003	17,194	987	510	6,870	7,670,000	2,700,000	0	304,106	0	0	0	0	0	10,674,106
2004	18,065	871	2300	5,120	7,670,000	0	0	0	0	0	0	0	0	7,670,000
2005	19,165	1,100	0	4,420	0	0	368,000	0	461,400	0	0	7,200,000	300,000	8,329,400
2006	20,332	1,167	900	300	9,037,292	0	0	0	0	0	600,000	0	0	9,637,292
2007	21,569	1,238	900	5,000	20,221,795	0	0	0	0	0	0	0	0	20,221,795
2008	22,882	1,313	4500	0	21,589,087	665,624	1,595,307	0	0	0	0	0	0	23,850,019
2009	23,811	929	0	80	7,029,005	176,938	0	0	0	0	0	0	0	7,205,943
2010	25,016	1,205	0	7,200	0	4,921,343	0	0	0	0	0	7,200,000	0	12,121,343
2011	26,282	1,266	0	240	0	6,835,198	0	495,600	0	0	0	0	0	7,330,798
2012	27,612	1,330	60	5,360	7,670,000	11,756,541	368,000	0	461,400	0	0	0	0	20,255,941
2013	29,009	1,397	172	0	0	3,827,711	0	0	0	0	0	0	0	3,827,711
2014	29,896	887	40	2,100	0	0	0	0	0	0	0	0	0	0
2015	31,103	1,207	60	300	0	0	0	0	0	0	600,000	0	0	600,000
2016	32,358	1,256	0	4,000	3,068,000	0	0	0	0	0	0	3,600,000	0	6,668,000
2017	33,665	1,306	0	0	0	0	0	0	0	0	0	0	0	0
2018	35,024	1,359	0	0	0	0	0	0	0	0	0	0	0	0
Total =		22,041 ①	13,066	57,413 ③	90,397,980	42,226,747	2,331,307	2,356,723	922,800	2,005,429	3,200,000	25,200,000	300,000	168,940,986 ⑤
NPV =		9,338 ②		30,903 ④	43,490,075	19,150,571	999,028	1,442,537	394,733	1,388,299	1,902,064	12,663,739	162,081	81,593,128 ⑥

Discount Rate 8.00% (= r)

	AIC (capacity)	US$/kW	2,640	⑦= ⑥/④
	AIC (demand)	US$/kW	8,738	⑧= ⑥/②
Power balance	Hydro	kW	5,870	10.18% (= h)
	Thermal	kW	51,787	89.82% (= t)

Energy value (kWh value)

Power value				
Weighted average life time		year	23.05	n = 50*h+20*t
CRF			0.0963	CRF = r/(1-(1+r)^(-n))
Annualized Power value		US$/kW/year	254.37	⑨=⑦*CRF
Average Plant factor		%	34.3%	⑩
Average total loss		%	9.9%	⑪
Fixed O&M cost		%	3.24%	⑫
Power value per kWh		US$/kWh	0.0970	⑬=⑨/(8760*⑩)/(1-⑪)*(1+⑫)
Energy value (weighted)		US$/kWh	0.0821	⑭＝e * t
	LRAIC =	US$/kWh	0.1791	⑮=⑬+⑭
		SB$/kWh	0.8956	
	LRMC =	US$/kWh	0.1922	⑯=⑧*CRF/8760/(1-⑪)*(1+⑫)+⑭
		SB$/kWh	0.9609	

Fuel Cost	0.0841	US$/kWh	
Energy loss	5.00%		
Variable O&M	3.24%		
Energy value	0.0914	US$/kWh	(= e)

Appendix 12-1-2 Honiara-Lungga grid Plan 1-4

Year	Peak Demand (kW)	Incremental Demand (kW)	Retire (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)	Plan-3 New (kW)	Plan-3 Total Cost (US$)	Plan-4 New (kW)	Plan-4 Total Cost (US$)
1998	10,450	0		0	0	0	0	0	0	0	0
1999	10,604	154	3,000	3,900	0	3,900	0	3,900	0	3,900	0
2000	11,144	540		4,200	6,442,800	4,200	6,442,800	4,200	6,442,800	4,200	6,442,800
2001	11,711	567		0	41,270,946	0	20,635,473	0	0	0	0
2002	12,477	766		0	41,270,946	0	20,635,473	0	0	0	0
2003	13,298	821		10,000	0	5,000	41,270,946	5,000	7,670,000	5,000	7,670,000
2004	14,168	870	2,300	0	0	5,000	0	5,000	7,670,000	5,000	7,670,000
2005	14,953	785		0	0	0	0	0	0	0	0
2006	15,785	832		0	9,037,292	0	9,037,292	0	9,037,292	0	0
2007	16,667	882		5,000	20,221,795	5,000	20,221,795	5,000	20,221,795	5,000	7,670,000
2008	17,602	935	3,600	0	21,589,087	0	21,589,087	0	21,589,087	5,000	7,670,000
2009	18,727	1,125		0	7,029,005	0	7,029,005	0	7,029,005	0	0
2010	19,632	905		3,000	0	3,000	0	3,000	0	0	0
2011	20,525	893		5,000	7,670,000	0	0	0	0	0	0
2012	21,495	970		0	0	5,000	7,670,000	5,000	7,670,000	0	0
2013	22,511	1,016		0	0	0	0	0	0	5,000	7,670,000
2014	23,237	726		0	0	0	0	0	0	0	0
2015	24,221	984		0	0	0	0	0	0	0	0
2016	25,247	1,026		2,000	3,068,000	0	0	2,000	3,068,000	0	0
2017	26,317	1,070		0	0	2,000	3,068,000	0	0	0	0
2018	27,434	1,117		0	0	0	0	0	0	0	0
Total =		16,984	8,900	33,100	157,599,873	33,100	157,599,873	33,100	90,397,980	33,100	44,792,800
NPV =		6,991		18,564	92,798,426	18,170	89,348,186	18,205	43,490,075	18,666	23,504,300
Discount Rate		8.00%									

	AIC (capacity)	US$/kW	4,999		4,917		2,389		1,259	
	AIC (demand)	US$/kW	13,274		12,780		6,221		3,362	
	*AIC = Average Incremental Cost									
Power balance	Hydro	kW	13,000	39.27%	13,000	39.27%	3,000	9.06%	0	0.00%
in 2018	Thermal	kW	20,100	60.73%	20,100	60.73%	30,100	90.94%	33,100	100.00%

Power value					
Weighted average life time	year	31.78	31.78	22.72	20.00
CRF		0.0876	0.0876	0.0969	0.1019
Annualized Power value	US$/kW/year	437.84	430.69	231.39	128.25
Average Plant factor	%	34.3%	34.3%	34.3%	34.3%
Average total loss	%	9.9%	9.9%	9.9%	9.9%
Fixed O&M cost	%	3.72%	3.72%	3.45%	3.40%
Power value per kWh	US$/kWh	0.1677	0.1650	0.0884	0.0490
Energy value (weight average)	US$/kWh	0.0556	0.0556	0.0833	0.0916

	LRAIC =	US$/kWh	0.2234	0.2206	0.1717	0.1406
		SB$/kWh	1.1168	1.1031	0.8585	0.7029
	LRMC =	US$/kWh	0.2083	0.2027	0.1622	0.1364
		SB$/kWh	1.0417	1.0133	0.8112	0.6822

Energy value (kWh value)

Fuel Cost	0.0841 US$/kWh
Loss factor	5.00%
Variable O&M	3.45%
Energy value	0.0916 US$/kWh

Appendix 12-1-3 Auki-Malu'u grid Plan 1-6

Year	Peak Demand (kW)	Incremental (kW)	Retire (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)	Plan-3 New (kW)	Plan-3 Total Cost (US$)	Plan-4 New (kW)	Plan-4 Total Cost (US$)	Plan-5 New (kW)	Plan-5 Total Cost (US$)	Plan-6 New (kW)	Plan-6 Total Cost (US$)
1998	470	0		0	0	0	0	0	0	0	0	0	0	0	0
1999	487	17		0	0	0	0	0	0	0	0	0	0	0	0
2000	481	-6		83	149,400	83	149,400	83	149,400	83	149,400	83	149,400	83	149,400
2001	478	-3	416	1,500	7,277,254	1,500	3,592,669	1,500	7,277,254	1,500	3,365,624	1,500	3,592,669	1,500	3,365,624
2002	2,387	1,909	208	1,500	3,916,738	1,500	2,937,292	1,500	3,916,738	1,500	2,876,938	1,500	2,937,292	1,500	2,876,938
2003	2,164	-223		1,800	2,700,000	1,900	2,700,000	1,800	2,700,000	1,700	2,700,000	1,900	2,700,000	1,700	2,700,000
2004	3,538	1,374		0	0	0	0	0	0	0	0	0	0	0	0
2005	3,578	40		0	0	0	0	0	0	0	892,669	0	0	0	0
2006	3,622	44		0	0	0	0	0	0	0	237,292	0	0	0	0
2007	3,668	46		0	892,669	0	0	0	0	400	0	0	0	0	0
2008	3,717	49		0	237,292	0	0	0	665,624	0	0	0	4,577,254	0	4,577,254
2009	3,765	48		400	0	0	665,624	0	176,938	0	0	0	1,216,738	0	1,216,738
2010	3,816	51		0	4,921,343	0	5,098,281	200	4,921,343	0	4,921,343	300	4,921,343	300	4,921,343
2011	3,871	55		0	6,835,198	200	6,835,198	0	6,835,198	0	6,835,198	0	6,835,198	0	6,835,198
2012	3,929	58		0	11,756,541	0	11,756,541	0	11,756,541	0	11,756,541	0	11,756,541	0	11,756,541
2013	3,990	61		0	3,827,711	0	3,827,711	0	3,827,711	0	3,827,711	0	3,827,711	0	3,827,711
2014	4,051	61		2,100	0	2,100	0	2,100	0	2,100	0	2,100	0	2,100	0
2015	5,715	1,664		0	0	0	0	0	0	0	0	0	0	0	0
2016	5,788	73		0	0	0	0	0	0	0	0	0	0	0	0
2017	5,866	78		0	0	0	0	0	0	0	0	0	0	0	0
2018	5,948	82		0	0	0	0	0	0	0	0	0	0	0	0
Total =		5,478	624	7,383	42,514,145	7,283	37,562,716	7,183	42,226,747	7,283	37,562,716	7,383	42,514,145	7,183	42,226,747
NPV =		2,629		4,050	19,310,081	4,022	15,749,346	3,965	19,150,571	4,013	15,812,983	4,065	17,866,246	3,938	17,658,286
Discount Rate		8.00%													

			Plan-1		Plan-2		Plan-3		Plan-4		Plan-5		Plan-6	
	AIC (capacity)	US$/kW	4,768		3,916		4,830		3,940		4,396		4,484	
	AIC (demand)	US$/kW	7,344		5,990		7,283		6,014		6,795		6,716	
Power balance	Hydro	kW	2,800	37.92%	2,700	37.07%	2,600	36.20%	2,700	37.07%	2,800	37.92%	2,600	36.20%
	Thermal	kW	4,583	62.08%	4,583	62.93%	4,583	63.80%	4,583	62.93%	4,583	62.08%	4,583	63.80%
Power value														
Weighted average life time		year	31.38		31.12		30.86		31.12		31.38		30.86	
CRF			0.0879		0.0880		0.0882		0.0880		0.0879		0.0882	
Annualized Power value		US$/kW/year	418.87		344.66		426.05		346.82		386.17		395.47	
Average Plant factor		%	34.3%		34.3%		34.3%		34.3%		34.3%		34.3%	
Average total loss		%	9.9%		9.9%		9.9%		9.9%		9.9%		9.9%	
Fixed O&M cost		%	3.00%		3.00%		3.00%		3.00%		3.00%		3.00%	
Power value per kWh		US$/kWh	0.1593		0.1311		0.1621		0.1319		0.1469		0.1504	
Energy value (weighted)		US$/kWh	0.0566		0.0574		0.0582		0.0574		0.0566		0.0582	
	LRAIC =	US$/kWh	0.2160		0.1885		0.2203		0.1893		0.2035		0.2086	
		SB$/kWh	1.0798		0.9425		1.1013		0.9466		1.0176		1.0432	
	LRMC =	US$/kWh	0.1408		0.1262		0.1420		0.1264		0.1345		0.1355	
		SB$/kWh	0.7039		0.6308		0.7100		0.6322		0.6724		0.6773	

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-4 Buala Plan 1-2

Year	Peak Demand (kW)	Incremental (kW)	Retire (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)
1998	70	0		0	0	0	0
1999	81	11		0	0	0	0
2000	89	8		0	0	0	0
2001	98	9		0	0	110	253,000
2002	108	10		0	0	0	0
2003	119	11		0	0	0	0
2004	129	10		0	0	0	0
2005	139	10		160	368,000	0	0
2006	151	12		0	0	0	0
2007	164	13		0	0	0	0
2008	177	13		0	1,595,307	0	0
2009	202	25		80	0	110	253,000
2010	216	14		0	0	0	0
2011	231	15		0	0	0	0
2012	247	16		160	368,000	110	253,000
2013	265	18	62	0	0	0	0
2014	281	16		0	0	0	0
2015	298	17		0	0	0	0
2016	316	18		0	0	0	0
2017	336	20		0	0	0	0
2018	357	21		0	0	0	0
Total =		287	62	400	2,331,307	330	759,000
NPV =		117		169	999,028	159	366,188
Discount Rate		8.00%					

	AIC (capacity)	US$/kW	5,924		2,300	
	AIC (demand)	US$/kW	8,563		3,139	
Power balance	Hydro	kW	80	20.00%	0	0.00%
	Thermal	kW	320	80.00%	330	100.00%

Power value			
Weighted average life time	year	26.00	20.00
CRF		0.0925	0.1019
Annualized Power value	US$/kW/year	547.98	234.26
Average Plant factor	%	34.3%	34.3%
Average total loss	%	9.9%	9.9%
Fixed O&M cost	%	3.00%	3.00%
Power value per kWh	US$/kWh	0.2085	0.0891
Energy value (weighted)	US$/kWh	0.0730	0.0912

LRAIC =	US$/kWh	0.2814	0.1803
	SB$/kWh	1.4071	0.9016
LRMC =	US$/kWh	0.1763	0.1329
	SB$/kWh	0.8815	0.6646

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-5 Kirakira Plan 1-3

Year	Peak Demand (kW)	Incremental (kW)	Retire (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)	Plan-3 New (kW)	Plan-3 Total Cost (US$)
1998	55	0		0	0	0	0	0	0
1999	69	14		0	0	0	0	0	0
2000	76	7		0	0	0	0	0	0
2001	84	8		200	413,000	200	413,000	200	413,000
2002	92	8		0	1,144,017	0	1,144,017	0	0
2003	101	9		0	304,106	0	304,106	0	0
2004	110	9		120	0	120	0	170	351,050
2005	120	10		0	0	0	0	0	0
2006	131	11		0	0	0	0	0	0
2007	143	12		0	882,304	0	0	0	0
2008	155	12		20	0	0	0	0	0
2009	179	24		0	0	0	0	0	0
2010	193	14		0	0	0	0	0	0
2011	207	14		0	0	240	495,600	170	351,050
2012	223	16	60	300	619,500	0	0	0	0
2013	240	17	50	0	0	0	0	0	0
2014	256	16		0	0	0	0	0	0
2015	274	18		0	0	0	0	0	0
2016	292	18		0	0	0	0	0	0
2017	312	20		0	0	0	0	0	0
2018	334	22		0	0	0	0	0	0
Total =		279	110	640	3,362,927	560	2,356,723	540	1,115,100
NPV =		113		320	1,877,774	299	1,442,537	304	627,920
Discount Rate		8.00%							

	AIC (capacity)	US$/kW	5,865	4,829	2,065	
	AIC (demand)	US$/kW	16,687	12,819	5,580	
Power balance	Hydro	kW	140	21.88%	120	21.43%	0	0.00%
	Thermal	kW	500	78.13%	440	78.57%	540	100.00%

Power value				
Weighted average life time	year	26.56	26.43	20.00
CRF		0.0919	0.0920	0.1019
Annualized Power value	US$/kW/year	538.97	444.44	210.32
Average Plant factor	%	34.3%	34.3%	34.3%
Average total loss	%	9.9%	9.9%	9.9%
Fixed O&M cost	%	3.00%	3.00%	3.00%
Power value per kWh	US$/kWh	0.2050	0.1691	0.0800
Energy value (weighted)	US$/kWh	0.0713	0.0717	0.0912

LRAIC =	US$/kWh	0.2763	0.2407	0.1712
	SB$/kWh	1.3814	1.2037	0.8561
LRMC =	US$/kWh	0.2713	0.2256	0.1653
	SB$/kWh	1.3564	1.1278	0.8267

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-6 Lata Plan 1-2

Year	Peak Demand (kW)	Incremental (kW)	Retire (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)
1998	65	0		0	0	0	0
1999	66	1		0	0	0	0
2000	70	4		0	0	0	0
2001	75	5		0	0	0	0
2002	80	5		0	0	0	0
2003	86	6		0	0	0	0
2004	91	5		0	0	0	0
2005	96	5		200	461,400	200	461,400
2006	102	6		0	0	0	0
2007	108	6		0	0	0	0
2008	115	7		0	0	0	0
2009	121	6		0	0	0	0
2010	128	7		0	0	0	0
2011	134	6		0	3,982,946	0	0
2012	141	7		50	0	200	461,400
2013	149	8	60	150	346,050	0	0
2014	156	7	40	0	0	0	0
2015	163	7	60	0	0	0	0
2016	170	7		0	0	0	0
2017	178	8		0	0	0	0
2018	186	8		0	0	0	0
Total =		121	160	400	4,790,396	400	922,800
NPV =		49		168	1,706,327	171	394,733
Discount Rate		8.00%					

	AIC (capacity)	US$/kW	10,181		2,307	
	AIC (demand)	US$/kW	34,537		7,990	
Power balance	Hydro	kW	50	12.50%	0	0.00%
	Thermal	kW	350	87.50%	400	100.00%

Power value			
Weighted average life time	year	23.75	20.00
CRF		0.0953	0.1019
Annualized Power value	US$/kW/year	970.50	234.97
Average Plant factor	%	34.3%	34.3%
Average total loss	%	9.9%	9.9%
Fixed O&M cost	%	3.00%	3.00%
Power value per kWh	US$/kWh	0.3692	0.0894
Energy value (weighted)	US$/kWh	0.0798	0.0912
LRAIC =	US$/kWh	0.4490	0.1806
	SB$/kWh	2.2449	0.9030
LRMC =	US$/kWh	0.5092	0.1974
	SB$/kWh	2.5462	0.9868

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-7 Taro-Choiseul Plan 1-2

Year	Peak Demand (kW)	Incremental (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)
1998	14	0	0	0	0	0
1999	19	5	0	0	0	0
2000	21	2	40	206,960	40	206,960
2001	23	2	0	0	0	0
2002	25	2	0	1,798,469	0	0
2003	28	3	70	0	120	620,880
2004	30	2	0	0	0	0
2005	32	2	0	0	0	0
2006	35	3	0	0	0	0
2007	38	3	0	0	0	0
2008	41	3	0	0	0	0
2009	57	16	0	0	0	0
2010	60	3	0	0	0	0
2011	63	3	0	0	0	0
2012	66	3	0	0	0	0
2013	70	4	0	0	0	0
2014	73	3	0	0	0	0
2015	76	3	0	0	0	0
2016	79	3	0	0	0	0
2017	82	3	0	0	0	0
2018	86	4	0	0	0	0
Total =		72	110	2,005,429	160	827,840
NPV =		31	76	1,388,299	107	555,551
Discount Rate		8.00%				

	AIC (capacity)	US$/kW	18,300		5,174	
	AIC (demand)	US$/kW	44,345		17,745	
Power balance	Hydro	kW	70	63.64%	0	0.00%
	Thermal	kW	40	36.36%	160	100.00%

Power value			
Weighted average life time	year	39.09	20.00
CRF		0.0842	0.1019
Annualized Power value	US$/kW/year	1,539.99	526.98
Average Plant factor	%	34.3%	34.3%
Average total loss	%	9.9%	9.9%
Fixed O&M cost	%	3.00%	3.00%
Power value per kWh	US$/kWh	0.5858	0.2005
Energy value (weighted)	US$/kWh	0.0332	0.0912
LRAIC =	US$/kWh	0.6190	0.2917
	SB$/kWh	3.0949	1.4584
LRMC =	US$/kWh	0.5199	0.3270
	SB$/kWh	2.5997	1.6348

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-8 Gizo Plan 1-3

Year	Peak Demand (kW)	Incremental (kW)	Retire (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)	Plan-3 New (kW)	Plan-3 Total Cost (US$)
1998	270	0		0	0	0	0	0	0
1999	485	215		0	0	0	0	0	0
2000	512	27		400	800,000	400	800,000	400	800,000
2001	541	29		0	0	0	0	400	800,000
2002	571	30		1,200	2,400,000	600	1,200,000	0	0
2003	603	32	510	0	0	0	0	400	800,000
2004	632	29		0	0	0	0	0	0
2005	662	30		0	0	0	0	0	0
2006	694	32		0	0	300	600,000	0	0
2007	727	33		0	0	0	0	0	0
2008	763	36		0	0	0	0	0	0
2009	793	30		0	0	0	0	400	800,000
2010	824	31		0	0	0	0	0	0
2011	856	32		0	0	0	0	0	0
2012	891	35		0	0	0	0	0	0
2013	926	35		0	0	0	0	0	0
2014	955	29		0	0	0	0	0	0
2015	984	29		600	1,200,000	300	600,000	0	0
2016	1,015	31		0	0	0	0	0	0
2017	1,046	31		0	0	0	0	0	0
2018	1,079	33		0	0	0	0	0	0
Total =		809	510	2,200	4,400,000	1,600	3,200,000	1,600	3,200,000
NPV =		438		1,284	2,568,764	951	1,902,064	1,022	2,044,916
Discount Rate		8.00%							

	AIC (capacity)	US$/kW	2,000		2,000	
	AIC (demand)	US$/kW	5,859		4,338	
Power balance	Hydro	kW	0	0.00%	0	0.00%
	Thermal	kW	2,200	100.00%	1,600	100.00%

Power value				
Weighted average life time	year	20.00	20.00	20.00
CRF		0.1019	0.1019	0.1019
Annualized Power value	US$/kW/year	203.70	203.70	203.70
Average Plant factor	%	34.3%	34.3%	34.3%
Average total loss	%	9.9%	9.9%	9.9%
Fixed O&M cost	%	3.00%	3.00%	3.00%
Power value per kWh	US$/kWh	0.0775	0.0775	0.0775
Energy value (weighted)	US$/kWh	0.0912	0.0912	0.0912
LRAIC =	US$/kWh	0.1687	0.1687	0.1687
	SB$/kWh	0.8435	0.8435	0.8435
LRMC =	US$/kWh	0.1690	0.1488	0.1532
	SB$/kWh	0.8452	0.7442	0.7659

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-9 Noro-Munda Plan 1-2

Year	Peak Demand (kW)	Incremental (kW)	Plan-1 Retire (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)
1998	1,790	0		0	0	0	0
1999	1,930	140		0	0	0	0
2000	2,150	220		0	0	0	0
2001	2,397	247		4,000	7,200,000	4,000	7,200,000
2002	2,673	276		0	0	0	0
2003	2,983	310		0	0	0	0
2004	3,297	314		0	0	0	0
2005	3,647	350		4,200	7,560,000	4,000	7,200,000
2006	4,036	389	900	0	0	0	0
2007	4,469	433	900	4,200	7,560,000	0	0
2008	4,951	482	900	0	0	0	0
2009	5,401	450		0	0	0	0
2010	5,893	492		0	0	4,000	7,200,000
2011	6,433	540		0	0	0	0
2012	7,024	591		0	0	0	0
2013	7,673	649		4,200	7,560,000	0	0
2014	8,289	616		0	0	0	0
2015	8,957	668		0	0	0	0
2016	9,683	726		0	0	2,000	3,600,000
2017	10,470	787		0	0	0	0
2018	11,326	856		0	0	0	0
Total =		9,536	2,700	16,600	29,880,000	14,000	25,200,000
NPV =		3,594		8,381	15,085,082	7,035	12,663,739
Discount Rate		8.00%					

	AIC (capacity)	US$/kW	1,800		1,800	
	AIC (demand)	US$/kW	4,198		3,524	
Power balance	Hydro	kW	0	0.00%	0	0.00%
	Thermal	kW	16,600	100.00%	14,000	100.00%

Power value					
Weighted average life time		year	20.00		20.00
CRF			0.1019		0.1019
Annualized Power value		US$/kW/year	183.33		183.33
Average Plant factor		%	34.3%		34.3%
Average total loss		%	9.9%		9.9%
Fixed O&M cost		%	3.00%		3.00%
Power value per kWh		US$/kWh	0.0697		0.0697
Energy value (weighted)		US$/kWh	0.0912		0.0912
	LRAIC =	US$/kWh	0.1610		0.1610
		SB$/kWh	0.8048		0.8048
	LRMC =	US$/kWh	0.1470		0.1380
		SB$/kWh	0.7349		0.6902

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-10 Tulagi Plan 1-2

Year	Peak Demand (kW)	Incremental (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)
1998	49	0	0	0	0	0
1999	61	12	0	0	0	0
2000	65	4	0	0	0	0
2001	68	3	0	0	0	0
2002	71	3	0	0	0	0
2003	75	4	0	0	0	0
2004	79	4	0	0	0	0
2005	82	3	83	415,000	60	300,000
2006	86	4	0	0	0	0
2007	91	5	0	0	0	0
2008	95	4	0	0	0	0
2009	99	4	0	0	0	0
2010	103	4	0	0	0	0
2011	108	5	0	0	0	0
2012	113	5	0	0	0	0
2013	118	5	0	0	0	0
2014	122	4	0	0	0	0
2015	127	5	0	0	0	0
2016	132	5	0	0	0	0
2017	137	5	0	0	0	0
2018	143	6	0	0	0	0
Total =		94	83	415,000	60	300,000
NPV =		44	45	224,212	32	162,081
Discount Rate		8.00%				

	AIC (capacity)	US$/kW	5,000		5,000	
	AIC (demand)	US$/kW	5,122		3,703	
Power balance	Hydro	kW	0	0.00%	0	0.00%
	Thermal	kW	327	100.00%	304	100.00%

Power value			
Weighted average life time	year	20.00	20.00
CRF		0.1019	0.1019
Annualized Power value	US$/kW/year	509.26	509.26
Average Plant factor	%	34.3%	34.3%
Average total loss	%	9.9%	9.9%
Fixed O&M cost	%	3.00%	3.00%
Power value per kWh	US$/kWh	0.1937	0.1937
Energy value (weighted)	US$/kWh	0.0912	0.0912
LRAIC =	US$/kWh	0.2849	0.2849
	SB$/kWh	1.4247	1.4247
LRMC =	US$/kWh	0.1593	0.1404
	SB$/kWh	0.7963	0.7020

Energy value (kWh value)

Fuel Cost	0.0841	US$/kWh
Energy loss	5.0%	
Variable O&M	3.0%	
Energy value	0.0912	US$/kWh

Appendix 12-1-11 Rennell Plan 1-2

Year	Peak Demand (kW)	Incremental (kW)	Plan-1 New (kW)	Plan-1 Total Cost (US$)	Plan-2 New (kW)	Plan-2 Total Cost (US$)
1998	6	0	0	0	0	0
1999	6	0	0	0	0	0
2000	7	1	0	0	0	0
2001	7	0	0	0	0	0
2002	8	1	60	1,500,000	60	1,500,000
2003	9	1	0	0	0	0
2004	9	0	0	0	0	0
2005	10	1	20	500,000	20	500,000
2006	10	0	0	0	0	0
2007	11	1	0	0	0	0
2008	12	1	30	750,000	30	750,000
2009	12	0	0	0	0	0
2010	13	1	0	0	0	0
2011	13	0	20	500,000	20	500,000
2012	14	1	0	0	0	0
2013	15	1	0	0	0	0
2014	15	0	30	750,000	30	750,000
2015	16	1	0	0	0	0
2016	16	0	0	0	0	0
2017	16	0	0	0	0	0
2018	17	1	0	0	0	0
Total =		11	160	4,000,000	160	4,000,000
NPV =		5	79	1,985,604	79	1,985,604
Discount Rate		8.00%				

	AIC (capacity)	US$/kW	25,000	25,000
	AIC (demand)	US$/kW	400,270	400,270
Power balance	Hydro	kW	0	0
	Thermal	kW	0	0
Power value				
Weighted average life time		year	20.00	20.00
CRF			0.1019	0.1019
Annualized Power value		US$/kW/year	2,546.31	2,546.31
Average Plant factor		%	6.6%	6.6%
Average total loss		%	0.0%	0.0%
Fixed O&M cost		%	0.00%	3.72%
Power value per kWh		US$/kWh	4.4060	4.5700
Energy value (weighted)		US$/kWh	0.0000	0.0000
	LRAIC =	US$/kWh	4.4060	4.5700
		SB$/kWh	22.0300	22.8500
	LRMC =	US$/kWh	4.6539	4.8272
		SB$/kWh	23.2696	24.1358

Appendix 12-2-7 (1) Calculation of IRR

Maotapku-1

FIRR = 5.244%

US$

Year	Cost	O&M	Sold Energy MWh	Benefit	NET
1	4,476,600	0		0	-4,476,600
2	6,217,500	0		0	-6,217,500
3	10,694,100	0		0	-10,694,100
4	3,481,800	0		0	-3,481,800
5		141,000	7,423	1,696,800	1,555,800
6		141,000	7,423	1,696,800	1,555,800
7		141,000	7,423	1,696,800	1,555,800
8		141,000	7,423	1,696,800	1,555,800
9		141,000	7,423	1,696,800	1,555,800
10		141,000	7,423	1,696,800	1,555,800
11		141,000	7,423	1,696,800	1,555,800
12		141,000	7,423	1,696,800	1,555,800
13		141,000	7,423	1,696,800	1,555,800
14		141,000	7,423	1,696,800	1,555,800
15		141,000	7,423	1,696,800	1,555,800
16		141,000	7,423	1,696,800	1,555,800
17		141,000	7,423	1,696,800	1,555,800
18		141,000	7,423	1,696,800	1,555,800
19		141,000	7,423	1,696,800	1,555,800
20		141,000	7,423	1,696,800	1,555,800
21		141,000	7,423	1,696,800	1,555,800
22		141,000	7,423	1,696,800	1,555,800
23		141,000	7,423	1,696,800	1,555,800
24		141,000	7,423	1,696,800	1,555,800
25		141,000	7,423	1,696,800	1,555,800
26		141,000	7,423	1,696,800	1,555,800
27		141,000	7,423	1,696,800	1,555,800
28		141,000	7,423	1,696,800	1,555,800
29		141,000	7,423	1,696,800	1,555,800
30		141,000	7,423	1,696,800	1,555,800
31		141,000	7,423	1,696,800	1,555,800
32		141,000	7,423	1,696,800	1,555,800
33		141,000	7,423	1,696,800	1,555,800
34		141,000	7,423	1,696,800	1,555,800
35		141,000	7,423	1,696,800	1,555,800
36		141,000	7,423	1,696,800	1,555,800
37		141,000	7,423	1,696,800	1,555,800
38		141,000	7,423	1,696,800	1,555,800
39		141,000	7,423	1,696,800	1,555,800
40		141,000	7,423	1,696,800	1,555,800
41		141,000	7,423	1,696,800	1,555,800
42		141,000	7,423	1,696,800	1,555,800
43		141,000	7,423	1,696,800	1,555,800
44		141,000	7,423	1,696,800	1,555,800
45		141,000	7,423	1,696,800	1,555,800
46		141,000	7,423	1,696,800	1,555,800
47		141,000	7,423	1,696,800	1,555,800
48		141,000	7,423	1,696,800	1,555,800
49		141,000	7,423	1,696,800	1,555,800
50		141,000	7,423	1,696,800	1,555,800

Alternative Diesel

kW coat	1,534	US$kW
Plant Factor	38.1%	
Power value	4,580	US$kW

EIRR = 3.280%

US$

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET
1	4,330,837	0		0	0	-4,330,837
2	6,015,052	0		0	0	-6,015,052
3	10,345,889	0		0	0	-10,345,889
4	3,368,429	0		7,328,669	0	3,960,240
5		136,409	7,423	0	647,611	511,202
6		136,409	7,423	0	647,611	511,202
7		136,409	7,423	0	647,611	511,202
8		136,409	7,423	0	647,611	511,202
9		136,409	7,423	0	647,611	511,202
10		136,409	7,423	0	647,611	511,202
11		136,409	7,423	0	647,611	511,202
12		136,409	7,423	0	647,611	511,202
13		136,409	7,423	0	647,611	511,202
14		136,409	7,423	0	647,611	511,202
15		136,409	7,423	0	647,611	511,202
16		136,409	7,423	0	647,611	511,202
17		136,409	7,423	0	647,611	511,202
18		136,409	7,423	0	647,611	511,202
19		136,409	7,423	0	647,611	511,202
20		136,409	7,423	0	647,611	511,202
21		136,409	7,423	0	647,611	511,202
22		136,409	7,423	0	647,611	511,202
23		136,409	7,423	0	647,611	511,202
24		136,409	7,423	7,328,669	647,611	7,839,871
25		136,409	7,423	0	647,611	511,202
26		136,409	7,423	0	647,611	511,202
27		136,409	7,423	0	647,611	511,202
28		136,409	7,423	0	647,611	511,202
29		136,409	7,423	0	647,611	511,202
30		136,409	7,423	0	647,611	511,202
31		136,409	7,423	0	647,611	511,202
32		136,409	7,423	0	647,611	511,202
33		136,409	7,423	0	647,611	511,202
34		136,409	7,423	0	647,611	511,202
35		136,409	7,423	0	647,611	511,202
36		136,409	7,423	0	647,611	511,202
37		136,409	7,423	0	647,611	511,202
38		136,409	7,423	0	647,611	511,202
39		136,409	7,423	0	647,611	511,202
40		136,409	7,423	0	647,611	511,202
41		136,409	7,423	0	647,611	511,202
42		136,409	7,423	0	647,611	511,202
43		136,409	7,423	0	647,611	511,202
44		136,409	7,423	7,328,669	647,611	7,839,871
45		136,409	7,423	0	647,611	511,202
46		136,409	7,423	0	647,611	511,202
47		136,409	7,423	0	647,611	511,202
48		136,409	7,423	0	647,611	511,202
49		136,409	7,423	0	647,611	511,202
50		136,409	7,423	0	647,611	511,202

Appendix 12-2-7 (2) Calculation of IRR

Maotapku-2

FIRR = 3.400%

Year	Cost	O&M	Sold Energy MWh	Benefit	NET (US$)
1	4,864,860	0		0	-4,864,860
2	6,756,750	0		0	-6,756,750
3	11,621,610	0		0	-11,621,610
4	3,783,780	0		0	-3,783,780
5		203,000	6,268	1,432,906	1,229,906
6		203,000	6,268	1,432,906	1,229,906
7		203,000	6,268	1,432,906	1,229,906
8		203,000	6,268	1,432,906	1,229,906
9		203,000	6,268	1,432,906	1,229,906
10		203,000	6,268	1,432,906	1,229,906
11		203,000	6,268	1,432,906	1,229,906
12		203,000	6,268	1,432,906	1,229,906
13		203,000	6,268	1,432,906	1,229,906
14		203,000	6,268	1,432,906	1,229,906
15		203,000	6,268	1,432,906	1,229,906
16		203,000	6,268	1,432,906	1,229,906
17		203,000	6,268	1,432,906	1,229,906
18		203,000	6,268	1,432,906	1,229,906
19		203,000	6,268	1,432,906	1,229,906
20		203,000	6,268	1,432,906	1,229,906
21		203,000	6,268	1,432,906	1,229,906
22		203,000	6,268	1,432,906	1,229,906
23		203,000	6,268	1,432,906	1,229,906
24		203,000	6,268	1,432,906	1,229,906
25		203,000	6,268	1,432,906	1,229,906
26		203,000	6,268	1,432,906	1,229,906
27		203,000	6,268	1,432,906	1,229,906
28		203,000	6,268	1,432,906	1,229,906
29		203,000	6,268	1,432,906	1,229,906
30		203,000	6,268	1,432,906	1,229,906
31		203,000	6,268	1,432,906	1,229,906
32		203,000	6,268	1,432,906	1,229,906
33		203,000	6,268	1,432,906	1,229,906
34		203,000	6,268	1,432,906	1,229,906
35		203,000	6,268	1,432,906	1,229,906
36		203,000	6,268	1,432,906	1,229,906
37		203,000	6,268	1,432,906	1,229,906
38		203,000	6,268	1,432,906	1,229,906
39		203,000	6,268	1,432,906	1,229,906
40		203,000	6,268	1,432,906	1,229,906
41		203,000	6,268	1,432,906	1,229,906
42		203,000	6,268	1,432,906	1,229,906
43		203,000	6,268	1,432,906	1,229,906
44		203,000	6,268	1,432,906	1,229,906
45		203,000	6,268	1,432,906	1,229,906
46		203,000	6,268	1,432,906	1,229,906
47		203,000	6,268	1,432,906	1,229,906
48		203,000	6,268	1,432,906	1,229,906
49		203,000	6,268	1,432,906	1,229,906
50		203,000	6,268	1,432,906	1,229,906

Alternative Diesel

kW coat	1,534	US$kW
Plant Factor	38.1%	
Power value	4,580	US$kW

EIRR = 1.416%

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET (US$)
1	4,706,455	0		0	0	-4,706,455
2	6,536,743	0		0	0	-6,536,743
3	11,243,198	0		0	0	-11,243,198
4	3,660,576	0		6,412,586	0	2,752,009
5		196,390	6,268	0	546,892	350,502
6		196,390	6,268	0	546,892	350,502
7		196,390	6,268	0	546,892	350,502
8		196,390	6,268	0	546,892	350,502
9		196,390	6,268	0	546,892	350,502
10		196,390	6,268	0	546,892	350,502
11		196,390	6,268	0	546,892	350,502
12		196,390	6,268	0	546,892	350,502
13		196,390	6,268	0	546,892	350,502
14		196,390	6,268	0	546,892	350,502
15		196,390	6,268	0	546,892	350,502
16		196,390	6,268	0	546,892	350,502
17		196,390	6,268	0	546,892	350,502
18		196,390	6,268	0	546,892	350,502
19		196,390	6,268	0	546,892	350,502
20		196,390	6,268	0	546,892	350,502
21		196,390	6,268	0	546,892	350,502
22		196,390	6,268	0	546,892	350,502
23		196,390	6,268	0	546,892	350,502
24		196,390	6,268	6,412,586	546,892	6,763,087
25		196,390	6,268	0	546,892	350,502
26		196,390	6,268	0	546,892	350,502
27		196,390	6,268	0	546,892	350,502
28		196,390	6,268	0	546,892	350,502
29		196,390	6,268	0	546,892	350,502
30		196,390	6,268	0	546,892	350,502
31		196,390	6,268	0	546,892	350,502
32		196,390	6,268	0	546,892	350,502
33		196,390	6,268	0	546,892	350,502
34		196,390	6,268	0	546,892	350,502
35		196,390	6,268	0	546,892	350,502
36		196,390	6,268	0	546,892	350,502
37		196,390	6,268	0	546,892	350,502
38		196,390	6,268	0	546,892	350,502
39		196,390	6,268	0	546,892	350,502
40		196,390	6,268	0	546,892	350,502
41		196,390	6,268	0	546,892	350,502
42		196,390	6,268	0	546,892	350,502
43		196,390	6,268	0	546,892	350,502
44		196,390	6,268	6,412,586	546,892	6,763,087
45		196,390	6,268	0	546,892	350,502
46		196,390	6,268	0	546,892	350,502
47		196,390	6,268	0	546,892	350,502
48		196,390	6,268	0	546,892	350,502
49		196,390	6,268	0	546,892	350,502
50		196,390	6,268	0	546,892	350,502

Appendix 12-2-7 (3) Calculation of IRR

Sasa

Alternative Diesel

kW coat 1,534 US$kW
Plant Factor 38.1%
Power value 4,580 US$kW

FIRR = 5.880%

US$

Year	Cost	O&M	Sold Energy MWh	Benefit	NET
1	4,906,690	0	0	0	-4,906,690
2	1,304,310	0	0	0	-1,304,310
3	0	62,000	2,269	470,472	408,472
4	0	62,000	2,269	470,472	408,472
5		62,000	2,269	470,472	408,472
6		62,000	2,269	470,472	408,472
7		62,000	2,269	470,472	408,472
8		62,000	2,269	470,472	408,472
9		62,000	2,269	470,472	408,472
10		62,000	2,269	470,472	408,472
11		62,000	2,269	470,472	408,472
12		62,000	2,269	470,472	408,472
13		62,000	2,269	470,472	408,472
14		62,000	2,269	470,472	408,472
15		62,000	2,269	470,472	408,472
16		62,000	2,269	470,472	408,472
17		62,000	2,269	470,472	408,472
18		62,000	2,269	470,472	408,472
19		62,000	2,269	470,472	408,472
20		62,000	2,269	470,472	408,472
21		62,000	2,269	470,472	408,472
22		62,000	2,269	470,472	408,472
23		62,000	2,269	470,472	408,472
24		62,000	2,269	470,472	408,472
25		62,000	2,269	470,472	408,472
26		62,000	2,269	470,472	408,472
27		62,000	2,269	470,472	408,472
28		62,000	2,269	470,472	408,472
29		62,000	2,269	470,472	408,472
30		62,000	2,269	470,472	408,472
31		62,000	2,269	470,472	408,472
32		62,000	2,269	470,472	408,472
33		62,000	2,269	470,472	408,472
34		62,000	2,269	470,472	408,472
35		62,000	2,269	470,472	408,472
36		62,000	2,269	470,472	408,472
37		62,000	2,269	470,472	408,472
38		62,000	2,269	470,472	408,472
39		62,000	2,269	470,472	408,472
40		62,000	2,269	470,472	408,472
41		62,000	2,269	470,472	408,472
42		62,000	2,269	470,472	408,472
43		62,000	2,269	470,472	408,472
44		62,000	2,269	470,472	408,472
45		62,000	2,269	470,472	408,472
46		62,000	2,269	470,472	408,472
47		62,000	2,269	470,472	408,472
48		62,000	2,269	470,472	408,472
49		62,000	2,269	470,472	408,472
50		62,000	2,269	470,472	408,472

EIRR = 2.726%

US$

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET
1	4,746,923	0	0	0	0	-4,746,923
2	1,261,840	0	0	1,282,517	0	20,677
3	0	59,981	2,269	0	197,968	137,987
4	0	59,981	2,269	0	197,968	137,987
5		59,981	2,269	0	197,968	137,987
6		59,981	2,269	0	197,968	137,987
7		59,981	2,269	0	197,968	137,987
8		59,981	2,269	0	197,968	137,987
9		59,981	2,269	0	197,968	137,987
10		59,981	2,269	0	197,968	137,987
11		59,981	2,269	0	197,968	137,987
12		59,981	2,269	0	197,968	137,987
13		59,981	2,269	0	197,968	137,987
14		59,981	2,269	0	197,968	137,987
15		59,981	2,269	0	197,968	137,987
16		59,981	2,269	0	197,968	137,987
17		59,981	2,269	0	197,968	137,987
18		59,981	2,269	0	197,968	137,987
19		59,981	2,269	0	197,968	137,987
20		59,981	2,269	0	197,968	137,987
21		59,981	2,269	0	197,968	137,987
22		59,981	2,269	1,282,517	197,968	1,420,504
23		59,981	2,269	0	197,968	137,987
24		59,981	2,269	0	197,968	137,987
25		59,981	2,269	0	197,968	137,987
26		59,981	2,269	0	197,968	137,987
27		59,981	2,269	0	197,968	137,987
28		59,981	2,269	0	197,968	137,987
29		59,981	2,269	0	197,968	137,987
30		59,981	2,269	0	197,968	137,987
31		59,981	2,269	0	197,968	137,987
32		59,981	2,269	0	197,968	137,987
33		59,981	2,269	0	197,968	137,987
34		59,981	2,269	0	197,968	137,987
35		59,981	2,269	0	197,968	137,987
36		59,981	2,269	0	197,968	137,987
37		59,981	2,269	0	197,968	137,987
38		59,981	2,269	0	197,968	137,987
39		59,981	2,269	0	197,968	137,987
40		59,981	2,269	0	197,968	137,987
41		59,981	2,269	0	197,968	137,987
42		59,981	2,269	1,282,517	197,968	1,420,504
43		59,981	2,269	0	197,968	137,987
44		59,981	2,269	0	197,968	137,987
45		59,981	2,269	0	197,968	137,987
46		59,981	2,269	0	197,968	137,987
47		59,981	2,269	0	197,968	137,987
48		59,981	2,269	0	197,968	137,987
49		59,981	2,269	0	197,968	137,987
50		59,981	2,269	0	197,968	137,987

Appendix 12-2-7 (4) Calculation of IRR

Silolo

Alternative Diesel

kW coat 1,800 US$kW

Plant Factor 20.0%

Power value 10,239 US$kW

FIRR = 6.432%

US$

Year	Cost	O&M	Sold Energy MWh	Benefit	NET
1	5,086,980	0	0	0	-5,086,980
2	7,065,250	0	0	0	-7,065,250
3	12,152,230	0	0	0	-12,152,230
4	3,956,540	0	0	0	-3,956,540
5		156,000	9,939	2,271,997	2,115,997
6		156,000	9,939	2,271,997	2,115,997
7		156,000	9,939	2,271,997	2,115,997
8		156,000	9,939	2,271,997	2,115,997
9		156,000	9,939	2,271,997	2,115,997
10		156,000	9,939	2,271,997	2,115,997
11		156,000	9,939	2,271,997	2,115,997
12		156,000	9,939	2,271,997	2,115,997
13		156,000	9,939	2,271,997	2,115,997
14		156,000	9,939	2,271,997	2,115,997
15		156,000	9,939	2,271,997	2,115,997
16		156,000	9,939	2,271,997	2,115,997
17		156,000	9,939	2,271,997	2,115,997
18		156,000	9,939	2,271,997	2,115,997
19		156,000	9,939	2,271,997	2,115,997
20		156,000	9,939	2,271,997	2,115,997
21		156,000	9,939	2,271,997	2,115,997
22		156,000	9,939	2,271,997	2,115,997
23		156,000	9,939	2,271,997	2,115,997
24		156,000	9,939	2,271,997	2,115,997
25		156,000	9,939	2,271,997	2,115,997
26		156,000	9,939	2,271,997	2,115,997
27		156,000	9,939	2,271,997	2,115,997
28		156,000	9,939	2,271,997	2,115,997
29		156,000	9,939	2,271,997	2,115,997
30		156,000	9,939	2,271,997	2,115,997
31		156,000	9,939	2,271,997	2,115,997
32		156,000	9,939	2,271,997	2,115,997
33		156,000	9,939	2,271,997	2,115,997
34		156,000	9,939	2,271,997	2,115,997
35		156,000	9,939	2,271,997	2,115,997
36		156,000	9,939	2,271,997	2,115,997
37		156,000	9,939	2,271,997	2,115,997
38		156,000	9,939	2,271,997	2,115,997
39		156,000	9,939	2,271,997	2,115,997
40		156,000	9,939	2,271,997	2,115,997
41		156,000	9,939	2,271,997	2,115,997
42		156,000	9,939	2,271,997	2,115,997
43		156,000	9,939	2,271,997	2,115,997
44		156,000	9,939	2,271,997	2,115,997
45		156,000	9,939	2,271,997	2,115,997
46		156,000	9,939	2,271,997	2,115,997
47		156,000	9,939	2,271,997	2,115,997
48		156,000	9,939	2,271,997	2,115,997
49		156,000	9,939	2,271,997	2,115,997
50		156,000	9,939	2,271,997	2,115,997

EIRR = 10.365%

US$

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET
1	4,921,343	0	0	0	0	-4,921,343
2	6,835,198	0	0	0	0	-6,835,198
3	11,756,541	0	0	0	0	-11,756,541
4	3,827,711	0	0	21,501,391	0	17,673,680
5		150,920	9,939	0	867,144	716,224
6		150,920	9,939	0	867,144	716,224
7		150,920	9,939	0	867,144	716,224
8		150,920	9,939	0	867,144	716,224
9		150,920	9,939	0	867,144	716,224
10		150,920	9,939	0	867,144	716,224
11		150,920	9,939	0	867,144	716,224
12		150,920	9,939	0	867,144	716,224
13		150,920	9,939	0	867,144	716,224
14		150,920	9,939	0	867,144	716,224
15		150,920	9,939	0	867,144	716,224
16		150,920	9,939	0	867,144	716,224
17		150,920	9,939	0	867,144	716,224
18		150,920	9,939	0	867,144	716,224
19		150,920	9,939	0	867,144	716,224
20		150,920	9,939	0	867,144	716,224
21		150,920	9,939	0	867,144	716,224
22		150,920	9,939	0	867,144	716,224
23		150,920	9,939	0	867,144	716,224
24		150,920	9,939	21,501,391	867,144	22,217,615
25		150,920	9,939	0	867,144	716,224
26		150,920	9,939	0	867,144	716,224
27		150,920	9,939	0	867,144	716,224
28		150,920	9,939	0	867,144	716,224
29		150,920	9,939	0	867,144	716,224
30		150,920	9,939	0	867,144	716,224
31		150,920	9,939	0	867,144	716,224
32		150,920	9,939	0	867,144	716,224
33		150,920	9,939	0	867,144	716,224
34		150,920	9,939	0	867,144	716,224
35		150,920	9,939	0	867,144	716,224
36		150,920	9,939	0	867,144	716,224
37		150,920	9,939	0	867,144	716,224
38		150,920	9,939	0	867,144	716,224
39		150,920	9,939	0	867,144	716,224
40		150,920	9,939	0	867,144	716,224
41		150,920	9,939	0	867,144	716,224
42		150,920	9,939	0	867,144	716,224
43		150,920	9,939	0	867,144	716,224
44		150,920	9,939	21,501,391	867,144	22,217,615
45		150,920	9,939	0	867,144	716,224
46		150,920	9,939	0	867,144	716,224
47		150,920	9,939	0	867,144	716,224
48		150,920	9,939	0	867,144	716,224
49		150,920	9,939	0	867,144	716,224
50		150,920	9,939	0	867,144	716,224
			0			

Appendix 12-2-7 (5) Calculation of IRR

Rori

Alternative Diesel

kW coat 1,800 US$kW
Plant Factor 20.0%
Power value 10,239 US$kW

FIRR = 6.429%

US$

Year	Cost	O&M	Sold Energy MWh	Benefit	NET
1	4,731,310	0	0	0	-4,731,310
2	1,257,690	0	0	0	-1,257,690
3	0	70,000	2,392	495,998	425,998
4	0	70,000	2,392	495,998	425,998
5		70,000	2,392	495,998	425,998
6		70,000	2,392	495,998	425,998
7		70,000	2,392	495,998	425,998
8		70,000	2,392	495,998	425,998
9		70,000	2,392	495,998	425,998
10		70,000	2,392	495,998	425,998
11		70,000	2,392	495,998	425,998
12		70,000	2,392	495,998	425,998
13		70,000	2,392	495,998	425,998
14		70,000	2,392	495,998	425,998
15		70,000	2,392	495,998	425,998
16		70,000	2,392	495,998	425,998
17		70,000	2,392	495,998	425,998
18		70,000	2,392	495,998	425,998
19		70,000	2,392	495,998	425,998
20		70,000	2,392	495,998	425,998
21		70,000	2,392	495,998	425,998
22		70,000	2,392	495,998	425,998
23		70,000	2,392	495,998	425,998
24		70,000	2,392	495,998	425,998
25		70,000	2,392	495,998	425,998
26		70,000	2,392	495,998	425,998
27		70,000	2,392	495,998	425,998
28		70,000	2,392	495,998	425,998
29		70,000	2,392	495,998	425,998
30		70,000	2,392	495,998	425,998
31		70,000	2,392	495,998	425,998
32		70,000	2,392	495,998	425,998
33		70,000	2,392	495,998	425,998
34		70,000	2,392	495,998	425,998
35		70,000	2,392	495,998	425,998
36		70,000	2,392	495,998	425,998
37		70,000	2,392	495,998	425,998
38		70,000	2,392	495,998	425,998
39		70,000	2,392	495,998	425,998
40		70,000	2,392	495,998	425,998
41		70,000	2,392	495,998	425,998
42		70,000	2,392	495,998	425,998
43		70,000	2,392	495,998	425,998
44		70,000	2,392	495,998	425,998
45		70,000	2,392	495,998	425,998
46		70,000	2,392	495,998	425,998
47		70,000	2,392	495,998	425,998
48		70,000	2,392	495,998	425,998
49		70,000	2,392	495,998	425,998
50		70,000	2,392	495,998	425,998

EIRR = 6.794%

US$

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET
1	4,577,254	0	0	0	0	-4,577,254
2	1,216,738	0	0	3,071,627	0	1,854,889
3	0	67,721	2,392	0	208,710	140,989
4	0	67,721	2,392	0	208,710	140,989
5		67,721	2,392	0	208,710	140,989
6		67,721	2,392	0	208,710	140,989
7		67,721	2,392	0	208,710	140,989
8		67,721	2,392	0	208,710	140,989
9		67,721	2,392	0	208,710	140,989
10		67,721	2,392	0	208,710	140,989
11		67,721	2,392	0	208,710	140,989
12		67,721	2,392	0	208,710	140,989
13		67,721	2,392	0	208,710	140,989
14		67,721	2,392	0	208,710	140,989
15		67,721	2,392	0	208,710	140,989
16		67,721	2,392	0	208,710	140,989
17		67,721	2,392	0	208,710	140,989
18		67,721	2,392	0	208,710	140,989
19		67,721	2,392	0	208,710	140,989
20		67,721	2,392	0	208,710	140,989
21		67,721	2,392	0	208,710	140,989
22		67,721	2,392	3,071,627	208,710	3,212,616
23		67,721	2,392	0	208,710	140,989
24		67,721	2,392	0	208,710	140,989
25		67,721	2,392	0	208,710	140,989
26		67,721	2,392	0	208,710	140,989
27		67,721	2,392	0	208,710	140,989
28		67,721	2,392	0	208,710	140,989
29		67,721	2,392	0	208,710	140,989
30		67,721	2,392	0	208,710	140,989
31		67,721	2,392	0	208,710	140,989
32		67,721	2,392	0	208,710	140,989
33		67,721	2,392	0	208,710	140,989
34		67,721	2,392	0	208,710	140,989
35		67,721	2,392	0	208,710	140,989
36		67,721	2,392	0	208,710	140,989
37		67,721	2,392	0	208,710	140,989
38		67,721	2,392	0	208,710	140,989
39		67,721	2,392	0	208,710	140,989
40		67,721	2,392	0	208,710	140,989
41		67,721	2,392	0	208,710	140,989
42		67,721	2,392	3,071,627	208,710	3,212,616
43		67,721	2,392	0	208,710	140,989
44		67,721	2,392	0	208,710	140,989
45		67,721	2,392	0	208,710	140,989
46		67,721	2,392	0	208,710	140,989
47		67,721	2,392	0	208,710	140,989
48		67,721	2,392	0	208,710	140,989
49		67,721	2,392	0	208,710	140,989
50		67,721	2,392	0	208,710	140,989

Appendix 12-2-7 (6) Calculation of IRR

Kware'a

Alternative Diesel

kW coat	1,800	US$kW
Plant Factor	20.0%	
Power value	10,239	US$kW

FIRR = 0.313%

Year	Cost	O&M	Sold Energy MWh	Benefit	NET US$
1	3,273,300	0	0	0	-3,273,300
2	4,546,250	0	0	0	-4,546,250
3	7,819,550	0	0	0	-7,819,550
4	2,545,900	0	0	0	-2,545,900
5		123,000	2,406	550,085	427,085
6		123,000	2,406	550,085	427,085
7		123,000	2,406	550,085	427,085
8		123,000	2,406	550,085	427,085
9		123,000	2,406	550,085	427,085
10		123,000	2,406	550,085	427,085
11		123,000	2,406	550,085	427,085
12		123,000	2,406	550,085	427,085
13		123,000	2,406	550,085	427,085
14		123,000	2,406	550,085	427,085
15		123,000	2,406	550,085	427,085
16		123,000	2,406	550,085	427,085
17		123,000	2,406	550,085	427,085
18		123,000	2,406	550,085	427,085
19		123,000	2,406	550,085	427,085
20		123,000	2,406	550,085	427,085
21		123,000	2,406	550,085	427,085
22		123,000	2,406	550,085	427,085
23		123,000	2,406	550,085	427,085
24		123,000	2,406	550,085	427,085
25		123,000	2,406	550,085	427,085
26		123,000	2,406	550,085	427,085
27		123,000	2,406	550,085	427,085
28		123,000	2,406	550,085	427,085
29		123,000	2,406	550,085	427,085
30		123,000	2,406	550,085	427,085
31		123,000	2,406	550,085	427,085
32		123,000	2,406	550,085	427,085
33		123,000	2,406	550,085	427,085
34		123,000	2,406	550,085	427,085
35		123,000	2,406	550,085	427,085
36		123,000	2,406	550,085	427,085
37		123,000	2,406	550,085	427,085
38		123,000	2,406	550,085	427,085
39		123,000	2,406	550,085	427,085
40		123,000	2,406	550,085	427,085
41		123,000	2,406	550,085	427,085
42		123,000	2,406	550,085	427,085
43		123,000	2,406	550,085	427,085
44		123,000	2,406	550,085	427,085
45		123,000	2,406	550,085	427,085
46		123,000	2,406	550,085	427,085
47		123,000	2,406	550,085	427,085
48		123,000	2,406	550,085	427,085
49		123,000	2,406	550,085	427,085
50		123,000	2,406	550,085	427,085

EIRR = 1.227%

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET US$
1	3,166,718	0	0	0	0	-3,166,718
2	4,398,219	0	0	0	0	-4,398,219
3	7,564,937	0	0	0	0	-7,564,937
4	2,463,003	0	0	6,143,255	0	3,680,252
5		118,995	2,406	0	209,949	90,954
6		118,995	2,406	0	209,949	90,954
7		118,995	2,406	0	209,949	90,954
8		118,995	2,406	0	209,949	90,954
9		118,995	2,406	0	209,949	90,954
10		118,995	2,406	0	209,949	90,954
11		118,995	2,406	0	209,949	90,954
12		118,995	2,406	0	209,949	90,954
13		118,995	2,406	0	209,949	90,954
14		118,995	2,406	0	209,949	90,954
15		118,995	2,406	0	209,949	90,954
16		118,995	2,406	0	209,949	90,954
17		118,995	2,406	0	209,949	90,954
18		118,995	2,406	0	209,949	90,954
19		118,995	2,406	0	209,949	90,954
20		118,995	2,406	0	209,949	90,954
21		118,995	2,406	0	209,949	90,954
22		118,995	2,406	0	209,949	90,954
23		118,995	2,406	0	209,949	90,954
24		118,995	2,406	6,143,255	209,949	6,234,209
25		118,995	2,406	0	209,949	90,954
26		118,995	2,406	0	209,949	90,954
27		118,995	2,406	0	209,949	90,954
28		118,995	2,406	0	209,949	90,954
29		118,995	2,406	0	209,949	90,954
30		118,995	2,406	0	209,949	90,954
31		118,995	2,406	0	209,949	90,954
32		118,995	2,406	0	209,949	90,954
33		118,995	2,406	0	209,949	90,954
34		118,995	2,406	0	209,949	90,954
35		118,995	2,406	0	209,949	90,954
36		118,995	2,406	0	209,949	90,954
37		118,995	2,406	0	209,949	90,954
38		118,995	2,406	0	209,949	90,954
39		118,995	2,406	0	209,949	90,954
40		118,995	2,406	0	209,949	90,954
41		118,995	2,406	0	209,949	90,954
42		118,995	2,406	0	209,949	90,954
43		118,995	2,406	0	209,949	90,954
44		118,995	2,406	6,143,255	209,949	6,234,209
45		118,995	2,406	0	209,949	90,954
46		118,995	2,406	0	209,949	90,954
47		118,995	2,406	0	209,949	90,954
48		118,995	2,406	0	209,949	90,954
49		118,995	2,406	0	209,949	90,954
50		118,995	2,406	0	209,949	90,954

Appendix 12-2-7 (7) Calculation of IRR

Kubolata

FIRR = 4.379%

Year	Cost	O&M	Sold Energy MWh	Benefit	NET (US$)
1	1,649,000	0	0	0	-1,649,000
2	0	23,000	533	105,285	82,285
3	0	23,000	533	105,285	82,285
4	0	23,000	533	105,285	82,285
5		23,000	533	105,285	82,285
6		23,000	533	105,285	82,285
7		23,000	533	105,285	82,285
8		23,000	533	105,285	82,285
9		23,000	533	105,285	82,285
10		23,000	533	105,285	82,285
11		23,000	533	105,285	82,285
12		23,000	533	105,285	82,285
13		23,000	533	105,285	82,285
14		23,000	533	105,285	82,285
15		23,000	533	105,285	82,285
16		23,000	533	105,285	82,285
17		23,000	533	105,285	82,285
18		23,000	533	105,285	82,285
19		23,000	533	105,285	82,285
20		23,000	533	105,285	82,285
21		23,000	533	105,285	82,285
22		23,000	533	105,285	82,285
23		23,000	533	105,285	82,285
24		23,000	533	105,285	82,285
25		23,000	533	105,285	82,285
26		23,000	533	105,285	82,285
27		23,000	533	105,285	82,285
28		23,000	533	105,285	82,285
29		23,000	533	105,285	82,285
30		23,000	533	105,285	82,285
31		23,000	533	105,285	82,285
32		23,000	533	105,285	82,285
33		23,000	533	105,285	82,285
34		23,000	533	105,285	82,285
35		23,000	533	105,285	82,285
36		23,000	533	105,285	82,285
37		23,000	533	105,285	82,285
38		23,000	533	105,285	82,285
39		23,000	533	105,285	82,285
40		23,000	533	105,285	82,285
41		23,000	533	105,285	82,285
42		23,000	533	105,285	82,285
43		23,000	533	105,285	82,285
44		23,000	533	105,285	82,285
45		23,000	533	105,285	82,285
46		23,000	533	105,285	82,285
47		23,000	533	105,285	82,285
48		23,000	533	105,285	82,285
49		23,000	533	105,285	82,285
50		23,000	533	105,285	82,285

Alternative Diesel

kW coat	2,300	US$kW
Plant Factor	20.0%	
Power value	13,083	US$kW

EIRR = 8.224%

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET (US$)
1	1,595,307	0	0	1,046,629	0	-548,678
2	0	22,251	533	0	46,518	24,267
3	0	22,251	533	0	46,518	24,267
4	0	22,251	533	0	46,518	24,267
5		22,251	533	0	46,518	24,267
6		22,251	533	0	46,518	24,267
7		22,251	533	0	46,518	24,267
8		22,251	533	0	46,518	24,267
9		22,251	533	0	46,518	24,267
10		22,251	533	0	46,518	24,267
11		22,251	533	0	46,518	24,267
12		22,251	533	0	46,518	24,267
13		22,251	533	0	46,518	24,267
14		22,251	533	0	46,518	24,267
15		22,251	533	0	46,518	24,267
16		22,251	533	0	46,518	24,267
17		22,251	533	0	46,518	24,267
18		22,251	533	0	46,518	24,267
19		22,251	533	0	46,518	24,267
20		22,251	533	0	46,518	24,267
21		22,251	533	1,046,629	46,518	1,070,895
22		22,251	533	0	46,518	24,267
23		22,251	533	0	46,518	24,267
24		22,251	533	0	46,518	24,267
25		22,251	533	0	46,518	24,267
26		22,251	533	0	46,518	24,267
27		22,251	533	0	46,518	24,267
28		22,251	533	0	46,518	24,267
29		22,251	533	0	46,518	24,267
30		22,251	533	0	46,518	24,267
31		22,251	533	0	46,518	24,267
32		22,251	533	0	46,518	24,267
33		22,251	533	0	46,518	24,267
34		22,251	533	0	46,518	24,267
35		22,251	533	0	46,518	24,267
36		22,251	533	0	46,518	24,267
37		22,251	533	0	46,518	24,267
38		22,251	533	0	46,518	24,267
39		22,251	533	0	46,518	24,267
40		22,251	533	0	46,518	24,267
41		22,251	533	1,046,629	46,518	1,070,895
42		22,251	533	0	46,518	24,267
43		22,251	533	0	46,518	24,267
44		22,251	533	0	46,518	24,267
45		22,251	533	0	46,518	24,267
46		22,251	533	0	46,518	24,267
47		22,251	533	0	46,518	24,267
48		22,251	533	0	46,518	24,267
49		22,251	533	0	46,518	24,267
50		22,251	533	0	46,518	24,267

Appendix 12-2-7 (8) Calculation of IRR

Waimapuru

Alternative Diesel

kW coat 2,065 US$kW
Plant Factor 20.0%
Power value 11,746 US$kW

FIRR = -1.143%

US$

Year	Cost	O&M	Sold Energy MWh	Benefit	NET
1	912,000	0	0	0	-912,000
2	0	18,000	161	31,781	13,781
3	0	18,000	161	31,781	13,781
4	0	18,000	161	31,781	13,781
5		18,000	161	31,781	13,781
6		18,000	161	31,781	13,781
7		18,000	161	31,781	13,781
8		18,000	161	31,781	13,781
9		18,000	161	31,781	13,781
10		18,000	161	31,781	13,781
11		18,000	161	31,781	13,781
12		18,000	161	31,781	13,781
13		18,000	161	31,781	13,781
14		18,000	161	31,781	13,781
15		18,000	161	31,781	13,781
16		18,000	161	31,781	13,781
17		18,000	161	31,781	13,781
18		18,000	161	31,781	13,781
19		18,000	161	31,781	13,781
20		18,000	161	31,781	13,781
21		18,000	161	31,781	13,781
22		18,000	161	31,781	13,781
23		18,000	161	31,781	13,781
24		18,000	161	31,781	13,781
25		18,000	161	31,781	13,781
26		18,000	161	31,781	13,781
27		18,000	161	31,781	13,781
28		18,000	161	31,781	13,781
29		18,000	161	31,781	13,781
30		18,000	161	31,781	13,781
31		18,000	161	31,781	13,781
32		18,000	161	31,781	13,781
33		18,000	161	31,781	13,781
34		18,000	161	31,781	13,781
35		18,000	161	31,781	13,781
36		18,000	161	31,781	13,781
37		18,000	161	31,781	13,781
38		18,000	161	31,781	13,781
39		18,000	161	31,781	13,781
40		18,000	161	31,781	13,781
41		18,000	161	31,781	13,781
42		18,000	161	31,781	13,781
43		18,000	161	31,781	13,781
44		18,000	161	31,781	13,781
45		18,000	161	31,781	13,781
46		18,000	161	31,781	13,781
47		18,000	161	31,781	13,781
48		18,000	161	31,781	13,781
49		18,000	161	31,781	13,781
50		18,000	161	31,781	13,781

EIRR = -2.252%

US$

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET
1	882,304	0	0	234,923	0	-647,382
2	0	17,414	161	0	14,042	-3,372
3	0	17,414	161	0	14,042	-3,372
4	0	17,414	161	0	14,042	-3,372
5		17,414	161	0	14,042	-3,372
6		17,414	161	0	14,042	-3,372
7		17,414	161	0	14,042	-3,372
8		17,414	161	0	14,042	-3,372
9		17,414	161	0	14,042	-3,372
10		17,414	161	0	14,042	-3,372
11		17,414	161	0	14,042	-3,372
12		17,414	161	0	14,042	-3,372
13		17,414	161	0	14,042	-3,372
14		17,414	161	0	14,042	-3,372
15		17,414	161	0	14,042	-3,372
16		17,414	161	0	14,042	-3,372
17		17,414	161	0	14,042	-3,372
18		17,414	161	0	14,042	-3,372
19		17,414	161	0	14,042	-3,372
20		17,414	161	0	14,042	-3,372
21		17,414	161	234,923	14,042	231,550
22		17,414	161	0	14,042	-3,372
23		17,414	161	0	14,042	-3,372
24		17,414	161	0	14,042	-3,372
25		17,414	161	0	14,042	-3,372
26		17,414	161	0	14,042	-3,372
27		17,414	161	0	14,042	-3,372
28		17,414	161	0	14,042	-3,372
29		17,414	161	0	14,042	-3,372
30		17,414	161	0	14,042	-3,372
31		17,414	161	0	14,042	-3,372
32		17,414	161	0	14,042	-3,372
33		17,414	161	0	14,042	-3,372
34		17,414	161	0	14,042	-3,372
35		17,414	161	0	14,042	-3,372
36		17,414	161	0	14,042	-3,372
37		17,414	161	0	14,042	-3,372
38		17,414	161	0	14,042	-3,372
39		17,414	161	0	14,042	-3,372
40		17,414	161	0	14,042	-3,372
41		17,414	161	234,923	14,042	231,550
42		17,414	161	0	14,042	-3,372
43		17,414	161	0	14,042	-3,372
44		17,414	161	0	14,042	-3,372
45		17,414	161	0	14,042	-3,372
46		17,414	161	0	14,042	-3,372
47		17,414	161	0	14,042	-3,372
48		17,414	161	0	14,042	-3,372
49		17,414	161	0	14,042	-3,372
50		17,414	161	0	14,042	-3,372

Appendix 12-2-7 (9) Calculation of IRR

Sorave

Alternative Diesel

kW coat 5,174 US$kW
Plant Factor 20.0%
Power value 15,449 US$kW

FIRR = 3.836%

Year	Cost	O&M	Sold Energy MWh	Benefit	NET US$
1	1,859,000	0	0	0	-1,859,000
2	0	26,000	561	110,708	84,708
3	0	26,000	561	110,708	84,708
4	0	26,000	561	110,708	84,708
5		26,000	561	110,708	84,708
6		26,000	561	110,708	84,708
7		26,000	561	110,708	84,708
8		26,000	561	110,708	84,708
9		26,000	561	110,708	84,708
10		26,000	561	110,708	84,708
11		26,000	561	110,708	84,708
12		26,000	561	110,708	84,708
13		26,000	561	110,708	84,708
14		26,000	561	110,708	84,708
15		26,000	561	110,708	84,708
16		26,000	561	110,708	84,708
17		26,000	561	110,708	84,708
18		26,000	561	110,708	84,708
19		26,000	561	110,708	84,708
20		26,000	561	110,708	84,708
21		26,000	561	110,708	84,708
22		26,000	561	110,708	84,708
23		26,000	561	110,708	84,708
24		26,000	561	110,708	84,708
25		26,000	561	110,708	84,708
26		26,000	561	110,708	84,708
27		26,000	561	110,708	84,708
28		26,000	561	110,708	84,708
29		26,000	561	110,708	84,708
30		26,000	561	110,708	84,708
31		26,000	561	110,708	84,708
32		26,000	561	110,708	84,708
33		26,000	561	110,708	84,708
34		26,000	561	110,708	84,708
35		26,000	561	110,708	84,708
36		26,000	561	110,708	84,708
37		26,000	561	110,708	84,708
38		26,000	561	110,708	84,708
39		26,000	561	110,708	84,708
40		26,000	561	110,708	84,708
41		26,000	561	110,708	84,708
42		26,000	561	110,708	84,708
43		26,000	561	110,708	84,708
44		26,000	561	110,708	84,708
45		26,000	561	110,708	84,708
46		26,000	561	110,708	84,708
47		26,000	561	110,708	84,708
48		26,000	561	110,708	84,708
49		26,000	561	110,708	84,708
50		26,000	561	110,708	84,708

EIRR = 6.694%

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET US$
1	1,798,469	0	0	1,081,445	0	-717,025
2	0	25,153	561	0	48,914	23,760
3	0	25,153	561	0	48,914	23,760
4	0	25,153	561	0	48,914	23,760
5		25,153	561	0	48,914	23,760
6		25,153	561	0	48,914	23,760
7		25,153	561	0	48,914	23,760
8		25,153	561	0	48,914	23,760
9		25,153	561	0	48,914	23,760
10		25,153	561	0	48,914	23,760
11		25,153	561	0	48,914	23,760
12		25,153	561	0	48,914	23,760
13		25,153	561	0	48,914	23,760
14		25,153	561	0	48,914	23,760
15		25,153	561	0	48,914	23,760
16		25,153	561	0	48,914	23,760
17		25,153	561	0	48,914	23,760
18		25,153	561	0	48,914	23,760
19		25,153	561	0	48,914	23,760
20		25,153	561	0	48,914	23,760
21		25,153	561	1,081,445	48,914	1,105,205
22		25,153	561	0	48,914	23,760
23		25,153	561	0	48,914	23,760
24		25,153	561	0	48,914	23,760
25		25,153	561	0	48,914	23,760
26		25,153	561	0	48,914	23,760
27		25,153	561	0	48,914	23,760
28		25,153	561	0	48,914	23,760
29		25,153	561	0	48,914	23,760
30		25,153	561	0	48,914	23,760
31		25,153	561	0	48,914	23,760
32		25,153	561	0	48,914	23,760
33		25,153	561	0	48,914	23,760
34		25,153	561	0	48,914	23,760
35		25,153	561	0	48,914	23,760
36		25,153	561	0	48,914	23,760
37		25,153	561	0	48,914	23,760
38		25,153	561	0	48,914	23,760
39		25,153	561	0	48,914	23,760
40		25,153	561	0	48,914	23,760
41		25,153	561	1,081,445	48,914	1,105,205
42		25,153	561	0	48,914	23,760
43		25,153	561	0	48,914	23,760
44		25,153	561	0	48,914	23,760
45		25,153	561	0	48,914	23,760
46		25,153	561	0	48,914	23,760
47		25,153	561	0	48,914	23,760
48		25,153	561	0	48,914	23,760
49		25,153	561	0	48,914	23,760
50		25,153	561	0	48,914	23,760

Appendix 12-2-7 (10) Calculation of IRR

Luembalele

FIRR = -3.568%

Year	Cost	O&M	Sold Energy MWh	Benefit	NET (US$)
1	4,117,000	0	0	0	-4,117,000
2	0	51,000	409	80,787	29,787
3	0	51,000	409	80,787	29,787
4	0	51,000	409	80,787	29,787
5		51,000	409	80,787	29,787
6		51,000	409	80,787	29,787
7		51,000	409	80,787	29,787
8		51,000	409	80,787	29,787
9		51,000	409	80,787	29,787
10		51,000	409	80,787	29,787
11		51,000	409	80,787	29,787
12		51,000	409	80,787	29,787
13		51,000	409	80,787	29,787
14		51,000	409	80,787	29,787
15		51,000	409	80,787	29,787
16		51,000	409	80,787	29,787
17		51,000	409	80,787	29,787
18		51,000	409	80,787	29,787
19		51,000	409	80,787	29,787
20		51,000	409	80,787	29,787
21		51,000	409	80,787	29,787
22		51,000	409	80,787	29,787
23		51,000	409	80,787	29,787
24		51,000	409	80,787	29,787
25		51,000	409	80,787	29,787
26		51,000	409	80,787	29,787
27		51,000	409	80,787	29,787
28		51,000	409	80,787	29,787
29		51,000	409	80,787	29,787
30		51,000	409	80,787	29,787
31		51,000	409	80,787	29,787
32		51,000	409	80,787	29,787
33		51,000	409	80,787	29,787
34		51,000	409	80,787	29,787
35		51,000	409	80,787	29,787
36		51,000	409	80,787	29,787
37		51,000	409	80,787	29,787
38		51,000	409	80,787	29,787
39		51,000	409	80,787	29,787
40		51,000	409	80,787	29,787
41		51,000	409	80,787	29,787
42		51,000	409	80,787	29,787
43		51,000	409	80,787	29,787
44		51,000	409	80,787	29,787
45		51,000	409	80,787	29,787
46		51,000	409	80,787	29,787
47		51,000	409	80,787	29,787
48		51,000	409	80,787	29,787
49		51,000	409	80,787	29,787
50		51,000	409	80,787	29,787

Alternative Diesel

kW coat	2,307	US$kW
Plant Factor	20.0%	
Power value	13,123	US$kW

EIRR = -4.610%

Year	Cost	O&M Cost	Sold Energy MWh	Benefit Construction	Benefit Fuel	NET (US$)
1	3,982,946	0	0	656,134	0	-3,326,813
2	0	49,339	409	0	35,694	-13,646
3	0	49,339	409	0	35,694	-13,646
4	0	49,339	409	0	35,694	-13,646
5		49,339	409	0	35,694	-13,646
6		49,339	409	0	35,694	-13,646
7		49,339	409	0	35,694	-13,646
8		49,339	409	0	35,694	-13,646
9		49,339	409	0	35,694	-13,646
10		49,339	409	0	35,694	-13,646
11		49,339	409	0	35,694	-13,646
12		49,339	409	0	35,694	-13,646
13		49,339	409	0	35,694	-13,646
14		49,339	409	0	35,694	-13,646
15		49,339	409	0	35,694	-13,646
16		49,339	409	0	35,694	-13,646
17		49,339	409	0	35,694	-13,646
18		49,339	409	0	35,694	-13,646
19		49,339	409	0	35,694	-13,646
20		49,339	409	0	35,694	-13,646
21		49,339	409	656,134	35,694	642,488
22		49,339	409	0	35,694	-13,646
23		49,339	409	0	35,694	-13,646
24		49,339	409	0	35,694	-13,646
25		49,339	409	0	35,694	-13,646
26		49,339	409	0	35,694	-13,646
27		49,339	409	0	35,694	-13,646
28		49,339	409	0	35,694	-13,646
29		49,339	409	0	35,694	-13,646
30		49,339	409	0	35,694	-13,646
31		49,339	409	0	35,694	-13,646
32		49,339	409	0	35,694	-13,646
33		49,339	409	0	35,694	-13,646
34		49,339	409	0	35,694	-13,646
35		49,339	409	0	35,694	-13,646
36		49,339	409	0	35,694	-13,646
37		49,339	409	0	35,694	-13,646
38		49,339	409	0	35,694	-13,646
39		49,339	409	0	35,694	-13,646
40		49,339	409	0	35,694	-13,646
41		49,339	409	656,134	35,694	642,488
42		49,339	409	0	35,694	-13,646
43		49,339	409	0	35,694	-13,646
44		49,339	409	0	35,694	-13,646
45		49,339	409	0	35,694	-13,646
46		49,339	409	0	35,694	-13,646
47		49,339	409	0	35,694	-13,646
48		49,339	409	0	35,694	-13,646
49		49,339	409	0	35,694	-13,646
50		49,339	409	0	35,694	-13,646

Appendix 12-2-7 (11) Calculation of IRR

Diesel Power Plant

Capacity	5000	kW	Plaant factor	38.1%					
kW cost	1,534	US$/kW			Capacity cost	1,531	US$/kWh		
Tariff	0.1881	US$/kWh	0.9403	SB$/kWh	Willingness to pay	0.1958	US$/kWh	0.9789	SB$/kWh
Fuel +O&M	0.0912	US$/kWh			Fuel +O&M	0.0910	US$/kWh		

FIRR = 17.01%

	Cost	Fuel O&M Cost	Sold Energy MWh	Benefit	Net
1	7,670,000	0	0	0	-7,670,000
2		1,293,852	14,185	2,667,695	1,373,842
3		1,293,852	14,185	2,667,695	1,373,842
4		1,293,852	14,185	2,667,695	1,373,842
5		1,293,852	14,185	2,667,695	1,373,842
6		1,293,852	14,185	2,667,695	1,373,842
7		1,293,852	14,185	2,667,695	1,373,842
8		1,293,852	14,185	2,667,695	1,373,842
9		1,293,852	14,185	2,667,695	1,373,842
10		1,293,852	14,185	2,667,695	1,373,842
11		1,293,852	14,185	2,667,695	1,373,842
12		1,293,852	14,185	2,667,695	1,373,842
13		1,293,852	14,185	2,667,695	1,373,842
14		1,293,852	14,185	2,667,695	1,373,842
15		1,293,852	14,185	2,667,695	1,373,842
16		1,293,852	14,185	2,667,695	1,373,842
17		1,293,852	14,185	2,667,695	1,373,842
18		1,293,852	14,185	2,667,695	1,373,842
19		1,293,852	14,185	2,667,695	1,373,842
20		1,293,852	14,185	2,667,695	1,373,842

EIRR = 18.67%

	Cost	Fuel O&M Cost	Sold Energy MWh	Benefit	Net
1	7,653,351	0	0	0	-7,653,351
2		1,291,044	14,185	2,777,099	1,486,055
3		1,291,044	14,185	2,777,099	1,486,055
4		1,291,044	14,185	2,777,099	1,486,055
5		1,291,044	14,185	2,777,099	1,486,055
6		1,291,044	14,185	2,777,099	1,486,055
7		1,291,044	14,185	2,777,099	1,486,055
8		1,291,044	14,185	2,777,099	1,486,055
9		1,291,044	14,185	2,777,099	1,486,055
10		1,291,044	14,185	2,777,099	1,486,055
11		1,291,044	14,185	2,777,099	1,486,055
12		1,291,044	14,185	2,777,099	1,486,055
13		1,291,044	14,185	2,777,099	1,486,055
14		1,291,044	14,185	2,777,099	1,486,055
15		1,291,044	14,185	2,777,099	1,486,055
16		1,291,044	14,185	2,777,099	1,486,055
17		1,291,044	14,185	2,777,099	1,486,055
18		1,291,044	14,185	2,777,099	1,486,055
19		1,291,044	14,185	2,777,099	1,486,055
20		1,291,044	14,185	2,777,099	1,486,055