

7.1.5 SHS とディーゼルミニグリッド電化のコスト比較

PV およびディーゼルシステムの一戸当たりの生涯コストが Appendix 表 7.1-2 に比較されている（太平洋諸島でのデータに基づく）。コンスタントドルで割引率年率 10%で割引いた 15 年間のコストの現在価値が比較された。

結果は照明のみの世帯（55Wp-1セット）および照明と TV/VCR 使用の場合（47Wp-4セット）の両方の場合で PV システムが生涯コストでコスト優位性を示した。

もう一つの重要な配慮すべき点は、ディーゼルシステムの適正なメンテナンスが非常に困難であるという事実である。実際ボツワナの小さな遠隔地の村でディーゼルシステムの安定的な運転を確保することはほとんど不可能である。

Appendix 表 7.1-2 Life-cycle Costs in Dollars per Customer of The PV and Diesel Systems

Case	The PV	Diesel
Household Lights Only ^a (55Wp - 1 set)		
Customer: initial appliance costs	132	51
Customer: future appliance costs	133	21
Generation equipment: initial costs ^b	741	750
Generation equipment: future costs ^c	243	189
O&M costs ^d	137	593
Total	1,386	1,604
Household Lights & TV/VCR ^b (47Wp - 4 set)		
Customer: initial appliance costs	732	551
Customer: future appliance costs	476	307
Generation equipment: initial costs ^b	2,216	1,719
Generation equipment: future costs ^c	454	432
O&M costs ^d	137	1,255
Total	4,015	4,264

（出典：World Bank Technical Paper Number 244 Lessons from the Pacific Island Experience, A. Liebenthal et al.）

Note: Discounted present value of costs in constant dollars for 15 years at a 10 percent discount rate.

- a ディーゼルシステムは 6 時間/日稼働
- b PV システム：PV パネル、バッテリー等
ディーゼルシステム：発電、配電設備
- c PV システム：バッテリー等の交換コスト
ディーゼルシステム：15 年間の耐用年数中 5 年ごとにオーバーホール
- d PV システム：ESCO によるメンテナンスコスト
ディーゼルシステム：変動発電コスト

Appendix 表 7.1-2-1 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year		
1-a SHS Electrification	Households(H)	50																										
	Capacity	100		Wp																								
	Annual consumption	0.365	7300	kWp/ly		7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	45,247		
	Distance from Grid	20		km																							(i = 0.15)	
	Investment costs (A)		96.3	P/Wp	481,500																						418,696	
	Battery replace		500	P				50,000																50,000				182,959
	Operation & maintenance: village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		37,189
	Agent fee		0.05	%		2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400		14,876
	:Head office	276		P/H/y		13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800		85,536
	Total																											739,255
Cost of electricity				P/kWh																							16.3	
1-b Grid Electrification	Households	50																										
	Annual consumption		7300	kWp/ly		7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300		45,247	
	Distance from Grid	20																									(i = 0.15)	
	Investment costs (A)		102816		2,056,320																						1,477,130	
	Connection costs		4500		225,000																						(45,000)	
	Operation & maintenance	0.02				41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126		254,911	
	Power generation or import cost		0.075	P/kWh		548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548		3,394	
	Total																										1,897,060	
	Cost of electricity				P/kWh																							41.9
	2-a SHS Electrification	Households	100																									
Capacity		100																										
Annual consumption		0.365	14600	kWp/ly		14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600		90,494	
Distance from Grid		20		km																							(i = 0.15)	
Investment costs (A)			96.3	P/Wp	963,000																						837,391	
Battery replace			500	P				100,000																100,000			365,917	
Operation & maintenance: village			500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		37,189	
Agent fee			0.05	%		4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800		29,752	
:Head office			276	P/H/y		27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600		171,071
Total																											1,441,320	
Cost of electricity				P/kWh																							15.9	
2-b Grid Electrification	Households	100																										
	Annual consumption		14600	kWp/ly		14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600		90,494	
	Distance from Grid	20																									(i = 0.15)	
	Investment costs (A)		102816		2,056,320																						1,477,130	
	Connection costs		4500		450,000																						(90,000)	
	Operation & maintenance	0.02				41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126		254,911	
	Power generation or import cost		0.075	P/kWh		1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095		6,787	
	Total																										2,062,079	
	Cost of electricity				P/kWh																							22.8

Appendix 表 7.1-2-2 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year	
1-a SHS Electrification																											
	Households(H)	200																									
	Capacity	100		Wp																							
	Annual consumption	0.365	29200	kWh/yr		29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	180,988	
	Distance from Grid	20	km																							(i = 0.15) 1,674,783	
	Investment costs (A)		96.3	P/Wp	1,926,000																					731,834	
	Battery replace		500	P			200,000																			200,000	
	Operation & maintenance: village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
	Agent fee		0.05	%		9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	59,503
	:Head office	276	276	P/H/y		55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	342,142	
	Total																									2,845,451	
	Cost of electricity			P/kWh																						15.7	
1-b Grid Electrification																											
	Households	200																									
	Annual consumption		29200	kWh/yr		29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	180,988	
	Distance from Grid	20																								(i = 0.15) 1,477,130	
	Investment costs (A)		102816		2,056,320																					411,264	
	Connection costs		4500		900,000																					(180,000)	
	Operation & maintenance	0.02				41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	254,911	
	Power generation or import cost		0.075	P/kWh		2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	13,574	
	Total																									2,392,118	
	Cost of electricity			P/kWh																						13.2	
2-a SHS Electrification																											
	Households	300																									
	Capacity	100																									
	Annual consumption	0.365	43800	kWh/yr		43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	271,483	
	Distance from Grid	20	km																							(i = 0.15) 2,512,174	
	Investment costs (A)		96.3	P/Wp	2,889,000																					300,000	
	Battery replace		500	P			300,000																			1,097,751	
	Operation & maintenance: village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189	
	Agent fee		0.05	%		14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	89,255	
	:Head office	276	276	P/H/y		82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	513,214	
	Total																									4,249,582	
	Cost of electricity			P/kWh																						15.7	
2-b Grid Electrification																											
	Households	300																									
	Annual consumption		43800	kWh/yr		43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	271,483	
	Distance from Grid	20																								(i = 0.15) 1,477,130	
	Investment costs (A)		102816		2,056,320																					411,264	
	Connection costs		4500		1,350,000																					(270,000)	
	Operation & maintenance	0.02				41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	41,126	254,911	
	Power generation or import cost		0.075	P/kWh		3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	20,361	
	Total																									2,722,156	
	Cost of electricity			P/kWh																						10.0	

Appendix 表 7.1-2-3 Comparison of Grid Electrification and SHS

																					Sum of NPV at 0 year residual value
1-a	SHS Electrification																				
		Households(H)	400																		
		Capacity	100	Wp																	
		Annual consumption	0.365	kWh/wh/y	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	361,977
		Distance from Grid	20	km																	(t = 0.15)
		Investment costs (A)			96.3	3,852,000															3,349,565
		Battery replace			500	P	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	1,463,668
		Operation & maintenance: village			500	P/Village/m	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
		Agent Fee			0.05	%	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	119,006
		:Head office	276		276	P/H/y	110,400	110,400	110,400	110,400	110,400	110,400	110,400	110,400	110,400	110,400	110,400	110,400	110,400	110,400	684,285
		Total																			5,653,714
		Cost of electricity																			15.6
1-b	Grid Electrification																				
		Households	400																		
		Annual consumption		kWh/wh/y	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	361,977
		Distance from Grid	20																		(t = 0.15)
		Investment costs (A)			102816	2,056,320															(411,264)
		Connection costs			4500	1,800,000															(360,000)
		Operation & maintenance	0.02																		0
		Power generation or import cost			0.075																27,148
		Total																			3,052,195
		Cost of electricity																			8.4
2-a	SHS Electrification																				
		Households	500																		
		Capacity	100																		
		Annual consumption	0.365	kWh/wh/y	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	452,471
		Distance from Grid	20	km																	(t = 0.15)
		Investment costs (A)			96.3	4,815,000															4,186,957
		Battery replace			500	P	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	1,829,585
		Operation & maintenance: village			500	P/Village/m	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
		Agent Fee			0.05	%	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	148,758
		:Head office	276		276	P/H/y	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	855,356
		Total																			7,057,845
		Cost of electricity																			15.6
2-b	Grid Electrification																				
		Households	500																		
		Annual consumption		kWh/wh/y	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	73,000	452,471
		Distance from Grid	20																		(t = 0.15)
		Investment costs (A)			102816	2,056,320															(411,264)
		Connection costs			4500	2,250,000															(450,000)
		Operation & maintenance	0.02																		254,911
		Power generation or import cost			0.075																33,935
		Total																			3,382,233
		Cost of electricity																			7.5

Appendix 表7.1-3-1 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year
1-a	SHS Electrification																									
	Households(H)	50																								
	Capacity	100		Wp																						
	Annual consumption	0.365	7300	kWh/wh/y		7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	45,247	
	Distance from Grid	6.6		km																						
	Investment costs (A)		96.3	P/Wp	481,500																					418,696
	Battery replace		500	P				50,000																		182,959
	Operation & maintenance: village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
	Agent fee		0.05	%		2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	14,876
	:Head office	276	276	P/H/y		13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	85,536
	Total																									739,255
	Cost of electricity																									16.3
1-b	Grid Electrification																									
	Households	50																								
	Annual consumption		7300	kWh/wh/y		7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	7,300	45,247
	Distance from Grid	6.6																								
	Investment costs (A)		102816		678,586																					
	Connection costs		4500		225,000																					
	Operation & maintenance	0.02				13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	13,572	84,121
	Power generation or import cost		0.075	P/kWh		548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	3,394
	Total																									736,593
	Cost of electricity																									16.3
2-a	SHS Electrification																									
	Households(H)	100																								
	Capacity	100		Wp																						
	Annual consumption	0.365	14600	kWh/wh/y		14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	90,494
	Distance from Grid	12.8		km																						
	Investment costs (A)		96.3	P/Wp	963,000																					
	Battery replace		500	P				100,000																		
	Operation & maintenance: village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
	Agent fee		0.05	%		4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	29,752
	:Head office	276	276	P/H/y		27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	171,071
	Total																									1,441,320
	Cost of electricity																									15.9
2-b	Grid Electrification																									
	Households	100																								
	Annual consumption		14600	kWh/wh/y		14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	90,494
	Distance from Grid	12.8																								
	Investment costs (A)		102816		1,316,045																					
	Connection costs		4500		450,000																					
	Operation & maintenance	0.02				26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	26,321	163,143
	Power generation or import cost		0.075	P/kWh		1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	6,787
	Total																									1,438,544
	Cost of electricity																									15.9

Appendix 表7.1-3-2 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year	
3-a SHS Electrification																											
	Households(H)	200																									
	Capacity	100		Wp																							
	Annual consumption	0.365	29200	kWp/ly		29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200		180,988	
	Distance from Grid	25.1		km																						(I = 0.15)	
	Investment costs (A)		96.3	P/Wp	1,926,000						200,000															731,834	
	Battery replace		500	P							6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		37,189	
	Operation & maintenance: village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		59,503	
	Agent fee		0.05	%		9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600		342,142	
	:Head office	276	276	P/H/y		55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200		2,845,451	
	Total																									15.7	
Cost of electricity																											
3-b Grid Electrification																											
	Households	200																									180,988
	Annual consumption		29200	kWp/ly		29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200		(I = 0.15)	
	Distance from Grid	25.1																								(516,136)	
	Investment costs (A)		102816		2,580,682																					1,853,798	
	Connection costs		4500		900,000																					(180,000)	
	Operation & maintenance																									319,913	
	Power generation or import cost		0.075	P/kWh		51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614	51,614		13,574	
	Total																									2,833,788	
	Cost of electricity																									15.7	
4-a SHS Electrification																											
	Households(H)	300																									271,483
	Capacity	100		Wp																						(I = 0.15)	
	Annual consumption	0.365	43800	kWp/ly		43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800		1,097,751	
	Distance from Grid	37.7		km																						2,512,174	
	Investment costs (A)		96.3	P/Wp	2,889,000						300,000															1,097,751	
	Battery replace		500	P		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		37,189	
	Operation & maintenance: village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		89,255	
	Agent fee		0.05	%		14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400		513,214	
	:Head office	276	276	P/H/y		82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800		4,249,582	
	Total																									15.7	
Cost of electricity																											
4-b Grid Electrification																											
	Households	300																									271,483
	Annual consumption		43800	kWp/ly		43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800		(I = 0.15)	
	Distance from Grid	37.7																								(775,233)	
	Investment costs (A)		102816		3,876,163																					2,784,389	
	Connection costs		4500		1,350,000																					(270,000)	
	Operation & maintenance																									969,754	
	Power generation or import cost		0.075	P/kWh		77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523	77,523		480,507	
	Total																									20,361	
	Cost of electricity																									4,255,012	
	Cost of electricity																									15.7	

Appendix 表7.1-3-3 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year	
1-a	SHS Electrification																									
	Households(H)																									
	Capacity	200																								
	Annual consumption	0.365	14600		14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600		90,494	
	Distance from Grid	13.7																								(i = -0.15)
	Investment costs (A)		96.3	963,000																						837,391
	Battery replace		500							100,000													100,000			365,917
	Operation & maintenance: village		500		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		37,189
	Agent fee		0.05		4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800		29,752
	:Head office	276			13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800		85,536
	Total																									1,355,785
	Cost of electricity																									15.0
1-b	Grid Electrification																									
	Households	50																								
	Annual consumption		14600		14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600	14,600		90,494
	Distance from Grid	13.7																								(i = -0.15)
	Investment costs (A)		102816	1,408,579																						1,011,834
	Connection costs		4500	225,000																						161,626
	Operation & maintenance	0.02			28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172	28,172		174,614
	Power generation or import cost		0.075		1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095		6,787
	Total																									1,354,861
	Cost of electricity																									15.0
2-a	SHS Electrification																									
	Households(H)	100																								
	Capacity	200																								
	Annual consumption	0.365	29200		29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200		180,988
	Distance from Grid	27																								(i = -0.15)
	Investment costs (A)		96.3	1,926,000																						1,674,783
	Battery replace		500							200,000													200,000			731,834
	Operation & maintenance: village		500		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000		37,189
	Agent fee		0.05		9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600		59,503
	:Head office	276			27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600		171,071
	Total																									2,674,380
	Cost of electricity																									14.8
2-b	Grid Electrification																									
	Households	100																								
	Annual consumption		29200		29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200		180,988
	Distance from Grid	27																								(i = -0.15)
	Investment costs (A)		102816	2,776,032																						1,994,125
	Connection costs		4500	450,000																						(90,000)
	Operation & maintenance	0.02			55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521	55,521		344,130
	Power generation or import cost		0.075		2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190		13,574
	Total																									2,675,080
	Cost of electricity																									14.8

Appendix 表7.1-3-4 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year		
3-a SHS Electrification	Households(H)	200																										
	Capacity	200		Wp																								
	Annual consumption	0.365	58400	kWh/yr		58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	361,977 (i = 0.15)	
	Distance from Grid	53.5		km																							3,349,565	
	Investment costs (A)		96.3	P/Wp	3,852,000																						1,463,668	
	Battery replace		500	P				400,000													400,000						400,000	
	Operation & maintenance; village		500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189	
	Agent fee		0.05	%		19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	119,006	
	:Head office	276	276	P/Hy		55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	55,200	342,142	
	Total																											5,311,571
Cost of electricity																											14.7	
3-b Grid Electrification	Households	200																										
	Annual consumption		58400	kWh/yr		58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	361,977 (i = 0.15)	
	Distance from Grid	53.5																										
	Investment costs (A)		102816		5,500,656																							
	Connection costs		4500		900,000																							
	Operation & maintenance	0.02				110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	110,013	681,887	
	Power generation or import cost		0.075	P/kWh		4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	27,148		
	Total																										5,306,860	
	Cost of electricity																										14.7	
	4-a SHS Electrification	Households(H)	300																									
Capacity		200		Wp																								
Annual consumption		0.365	87600	kWh/yr		87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	542,965 (i = 0.15)	
Distance from Grid		80		km																							5,024,348	
Investment costs (A)			96.3	P/Wp	5,778,000																						2,195,502	
Battery replace			500	P				600,000													600,000						600,000	
Operation & maintenance; village			500	P/Village/m		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189	
Agent fee			0.05	%		28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	178,509	
:Head office		276	276	P/Hy		82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	82,800	513,214	
Total																												7,948,762
Cost of electricity																										14.6		
4-b Grid Electrification	Households	300																										
	Annual consumption		87600	kWh/yr		87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	542,965 (i = 0.15)	
	Distance from Grid	80																										
	Investment costs (A)		102816		8,225,280																							
	Connection costs		4500		1,350,000																							
	Operation & maintenance	0.02				164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	164,506	1,019,644	
	Power generation or import cost		0.075	P/kWh		6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	40,722	
	Total																											7,938,638
	Cost of electricity																										14.6	

Appendix 表7.1-3-5 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year	
5-a SHS Electrification	Households(H)	50																									
	Capacity	Wp																									
	Annual consumption	0.365	29200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	180,988	
	Distance from Grid	27.8	km																								(i = 0.15)
	Investment costs (A)				1,926,000																						1,674,783
	Battery replace			96.3	P/Wp	200,000					200,000										200,000						731,834
	Operation & maintenance: village			500	P/Village/m	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
	Agent fee			0.05	%	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	9,600	59,503
	:Head office	276	P/H/y	276		13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	85,536
	Total																										2,588,845
Cost of electricity																										14.3	
5-b Grid Electrification	Households	50																									
	Annual consumption	0.365	29200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	180,988	
	Distance from Grid	27.8																									(i = 0.15)
	Investment costs (A)				2,858,285																						2,053,210
	Connection costs				4500																						(45,000)
	Operation & maintenance	0.02			57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	57,166	354,326
	Power generation or import cost			0.075		2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	2,190	13,574
	Total																										2,582,736
	Cost of electricity																										14.3
	6-a SHS Electrification	Households(H)	100																								
Capacity		400	Wp																								
Annual consumption		0.365	58400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	361,977	
Distance from Grid		55.3	km																								(i = 0.15)
Investment costs (A)					3,852,000																						3,349,565
Battery replace				96.3	P/Wp	400,000					400,000										400,000						1,463,668
Operation & maintenance: village				500	P/Village/m	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189	
Agent fee				0.05	%	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	19,200	119,006
:Head office		276	P/H/y	276		27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	171,071
Total																											5,140,500
Cost of electricity																										14.2	
6-b Grid Electrification	Households	100																									
	Annual consumption	0.365	58400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	58,400	361,977	
	Distance from Grid	55.3																									(i = 0.15)
	Investment costs (A)				5,685,725																						4,084,264
	Connection costs				4500																						(90,000)
	Operation & maintenance	0.02			113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	113,714	704,829	
	Power generation or import cost			0.075		4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	4,380	27,148	
	Total																										5,139,492
	Cost of electricity																										14.2

Appendix 表 7.1-3-6 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year		
7-a SHS Electrification	Households(H)	200																									
	Capacity	400																									
	Annual consumption	0.365																									
	Distance from Grid	110	km		116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	116,800	723,953		
	Investment costs (A)			96.3																					(i = 0.15)		
	Battery replace			500																						6,699,130	
	Operation & maintenance: village			500																						2,927,336	
	Agent fee			0.05																							37,189
	:Head office	276		276																							238,012
	Total																										342,142
Cost of electricity																										10,243,811	
7-b Grid Electrification	Households	200																									
	Annual consumption																										
	Distance from Grid	110																									
	Investment costs (A)			102816																							
	Connection costs			4500																							
	Operation & maintenance	0.02																									
	Power generation or import cost			0.075																							
	Total																										
	Cost of electricity																										
	8-a SHS Electrification	Households(H)	300																								
Capacity		400																									
Annual consumption		0.365																									
Distance from Grid		165	km																								
Investment costs (A)				96.3																							
Battery replace				500																							
Operation & maintenance: village				500																							
Agent fee				0.05																							
:Head office		276		276																							
Total																											
Cost of electricity																											
8-b Grid Electrification	Households	300																									
	Annual consumption																										
	Distance from Grid	165																									
	Investment costs (A)			102816																							
	Connection costs			4500																							
	Operation & maintenance	0.02																									
	Power generation or import cost			0.075																							
	Total																										
	Cost of electricity																										

Appendix 表7.1-3-7 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year
9-a	SHS Electrification																									
	Households(H)	50																								
	Capacity	600		Wp																						
	Annual consumption	0.365	43800	kWp/ly		43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	271,483
	Distance from Grid	42		km																						(i = 0.15)
	Investment costs (A)		96.3	P/Wp	2,889,000																					2,512,174
	Battery replace		500	P			300,000				300,000										300,000					1,097,751
	Operation & maintenance: village		500	P/Village/ym		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
	Agent fee		0.05	%		14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400	89,255
	:Head office	276	276	P/H/y		13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	13,800	85,536
	Total																									3,821,905
	Cost of electricity																									14.1
9-b	Grid Electrification																									
	Households	50																								
	Annual consumption		43800	kWp/ly		43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	43,800	271,483
	Distance from Grid	42																								(i = 0.15)
	Investment costs (A)		102816		4,318,272																					3,101,972
	Connection costs		4500		225,000																					(865,654)
	Operation & maintenance	0.02				86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	86,365	535,313
	Power generation or import cost		0.075	P/kWh		3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	3,285	20,361
	Total																									3,819,272
	Cost of electricity																									14.1
10-a	SHS Electrification																									
	Households(H)	100																								
	Capacity	600		Wp																						
	Annual consumption	0.365	87600	kWp/ly		87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	542,965
	Distance from Grid	83.6		km																						(i = 0.15)
	Investment costs (A)		96.3	P/Wp	5,778,000																					5,024,348
	Battery replace		500	P			600,000				600,000										600,000					2,195,502
	Operation & maintenance: village		500	P/Village/ym		6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	37,189
	Agent fee		0.05	%		28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	28,800	178,509
	:Head office	276	276	P/H/y		27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	27,600	171,071
	Total																									7,606,620
	Cost of electricity																									14.0
10-b	Grid Electrification																									
	Households	100																								
	Annual consumption		87600	kWp/ly		87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	87,600	542,965
	Distance from Grid	83.6																								(i = 0.15)
	Investment costs (A)		102816		8,595,418																					6,174,402
	Connection costs		4500		450,000																					(1,719,084)
	Operation & maintenance	0.02				171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	171,908	1,065,528
	Power generation or import cost		0.075	P/kWh		6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	40,722
	Total																									7,603,904
	Cost of electricity																									14.0

Appendix 表7.1-3-8 Comparison of Grid Electrification and SHS

	Variables	Units	Unit cost	Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	residual value	Sum of NPV at 0 year		
11-a SHS Electrification	Households(H)																											
	Capacity	600		Wp																								
	Annual consumption	0.365		kWh/wh/y	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	1,085,930		
	Distance from Grid	0	km																								10,048,696	
	Investment costs (A)				11,556,000																						4,391,004	
	Battery replace				96.3																							37,189
	Operation & maintenance: village				500																							357,018
	Agent fee				0.05																							14,833,908
	:Head office				276																							13.7
	Cost of electricity																											
11-b Grid Electrification	Households	200																									1,085,930	
	Annual consumption			kWh/wh/y	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200	175,200		1,085,930	
	Distance from Grid	164																									12,112,463	
	Investment costs (A)				16,861,824																						646,503	
	Connection costs				4500																							
	Operation & maintenance	0.02																										2,090,270
	Power generation or import cost																										81,445	
	Total																										14,930,681	
	Cost of electricity																											13.7
	12-a SHS Electrification	Households(H)	300																									
Capacity		600		Wp																								
Annual consumption		0.365		kWh/wh/y	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800		1,628,895	
Distance from Grid		250	km																								15,073,043	
Investment costs (A)					17,334,000																						6,586,507	
Battery replace					500																							37,189
Operation & maintenance: village					500																							535,527
Agent fee					0.05																							513,214
:Head office					276																							22,745,480
Total																											14.0	
Cost of electricity																												
12-b Grid Electrification	Households	300																									1,628,895	
	Annual consumption			kWh/wh/y	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800		1,628,895	
	Distance from Grid	250																									18,464,121	
	Investment costs (A)				25,704,000																						969,754	
	Connection costs				4500																							
	Operation & maintenance	0.02																										3,186,387
	Power generation or import cost																										122,167	
	Total																										22,745,429	
	Cost of electricity																										14.0	