

#### 4. 社会経済調査（電力需要及び 支払い意思額）の概要と結果

## 付属書-4.

### 社会経済調査（電力需要及び支払い意思額）の概要と結果

本社会経済調査は電力需要予測及び電気料金改定の基礎情報を収集する目的で以下の社会経済調査を実施した。調査に当たっては現地のコンサルタントを再雇用し、各需要家へのインタビュー調査を実施することとし、①国勢調査、類似の社会経済調査、NPAによる過去の需要家調査等の経験を有すること、②経済学、統計学のバックグラウンドを有する専門家を配置すること、③現地事情に精通していること、を条件に現地再委託先を選定した。

本社会経済調査は標本調査であるが、統計上有意となる標本数を設定し、標本の抽出過程において各サンプルが等しい確率で選ばれるようサンプリング方法を工夫することで、効率的かつ効果的な調査を実施する。調査の概要と主要な結果は以下の通りである。

#### (1) 調査対象地域(ウェスタンエリア州)の人口、世帯数

調査対象地域(ウェスタンエリア州)の人口、世帯数は以下の通りである。

#### 調査対象地域の人口、世帯数の概要

2004年人口統計(Population Census)					2004年人口統計による推定	人口推定に基づく想定*		
州	郡	区	人口	世帯数	2008年人口	2008年世帯数		
Western Area	(Rural + Urban)	合計	947,122	164,198	1,133,247	196,442		
		Western Rural	Koya	22,996			3,967	
			Mountain	9,925			1,712	
			Waterloo	77,791			13,420	
			York Rural	63,537			10,961	
	小計	174,249	30,060	231,294			39,901	
	Western Urban	Central-1	50,271	8,725			901,953	156,541
		Central-2	20,135	3,495				
		East-1	55,166	9,574				
		East-2	79,934	13,873				
		East-3	316,409	54,915				
		West-1	46,319	8,039				
		West-2	91,345	15,854				
		West-3	113,294	19,663				
		小計	772,873	134,138				

[出所] Statistics Sierra Leone (2006.2), "Final Results 2004 Population and Housing Census"

Statistics Sierra Leone (2006.11), "Analytical Report on Population Projection for Sierra Leone"

[備考] \*は2004年人口統計の1世帯辺り平均人数 (Rural=5.797、Urban=5.762人/世帯) にて当社算出

#### (2) 調査手法

##### 1) 統計上有意な標本数の検討

標本調査において、抽出された標本及び標本統計が、ある誤差、信頼度を満足するための標本数は、以下の式で表される。

$$\text{標本数} = \chi_{sq} NP(1-P) / \{C^2 (N-1) + \chi_{sq} P(1-P)\}$$

ここで、C：信頼区間（標本統計量の誤差の幅）

N：母集団の人数

P：母比率（母比率が未知の場合、安全サイドで0.5を使用）

$\chi_{sq}$ ：カイ（ $\chi$ ）二乗分布のパーセント点。上側確率が5%の場合、 $\chi_{sq}=3.841$ 。

## 2) 既に配電設備が設置されている地域の標本数

本調査では、支払い意思額調査として、既に配電設備が設置されている地域から約 200 サンプルの顧客を目処に抜き取り調査を実施するものとする。次表に信頼区間を 5%、確率 95% とした場合と、信頼区間 10%、確率 90% とした場合の必要標本数を示す。前者の場合、標本数の合計が 1,159 個となり、目標サンプル数 260 個を大幅に超過する。後者の場合は、サンプル数が 253 個となり目処とする約 260 サンプルに合致するため、後者を採用した。

標本数の検討（既電化地域）

需要家分類	需要家数		信頼区間 5%、確率 95% の標本数		信頼区間 10%、確率 90% の標本数	
	比率	比率	比率	比率	比率	比率
家庭用	37,992	84.59%	381	32.9%	68	26.9
商業用	5,676	12.64%	360	31.1%	67	26.5
公共機関用	780	1.74%	258	22.3%	63	24.9
産業用	272	0.61%	160	13.8%	55	21.7
合計	44,720		1,159		253	

## 3) 電力供給が中断された地域及び未電化地域

本調査では、既に配電設備が設置されている地域と同様に、電力供給が中断された地域及び未電化地域から約 200 サンプルの顧客を目処に抜き取り調査を実施するものとする。次表に信頼区間を 5%、確率 95% とした場合と、信頼区間 10%、確率 90% とした場合の必要標本数を示す。前者の場合、標本数の合計が 381 個となり、目処とする約 200 サンプルの 2 倍程度となる。後者の場合は、サンプル数が 68 個となり目処とするサンプル数の三分の一程度となる。サンプル総数を 200 個とすれば、信頼区間 10%、確率 90% を上回る信頼性を得られることから、総標本数を 200 個とし、区毎のサンプル数は世帯数の比率で按分した。

標本数の検討（電力供給中断及び未電化地域）

区	2008 年の世帯数 (想定)		信頼区間 5%、確率 95% の標本数		信頼区間 10%、確率 90% の標本数		総標本数 200 個を比例按分	
	比率	比率	比率	比率	比率	比率	比率	比率
Koya	5,266	13.2%	50	13.2%	9	13.2%	26	13.2%
Mountain	2,273	5.7%	22	5.7%	5	5.7%	12	5.7%
Waterloo	17,813	44.6%	170	44.6%	31	44.6%	89	44.6%
York Rural	14,549	36.5%	139	36.5%	25	36.5%	73	36.5%
合計	39,901		381		68		200	

## (3) 実際の調査対象の母集団とサンプリング数

既存の配電網はウェスタンエリア都市部（Western Area Urban）の 8 区を中心に整備されており、地方部（Western Area Rural）においては Mountain 区の Charlotte 村、York Rural 区の Sussex 村、Waterloo 区の Benguema 村まで配電線が延伸されていた。現在では York Rural 区では途中の Lakka 村まで、Waterloo 区方面はフリータウン東部の Wellington 変電所周辺までしか電力が供給

されていない。Koya 区については、現時点では NPA の配電網と接続されていない。以上の状況を踏まえ、調査対象の母集団とサンプリング数を以下の通り設定した。

**1) 既に配電設備が設置されている地域**

母集団は NPA の需要家の内、2,008 年 11 月現在請求書が発行されている 16,384 軒のうち、街路灯、臨時供給、溶接用を除いた、家庭用(T1)、商業用(T2)、公共用機関用(T3)、産業用(T4) の 4 需要家区分を調査対象の母集団とし、無作為抽出法で調査対象を選定し、更に実際の調査数に削減した。算定された調査対象カテゴリー別サンプル数は以下の通りである。

	Domestic(T1)	Commercial(T2)	Institution(T3)	Industrial(T4)
Random Sample Size	92	90	81	65
Actual Sample Size after downsizing	70	70	65	55

合計サンプル数 ; 260

**2) 未電化地域及び送電中断地域 ;**

未電化地域及び送電中断地域である Koya, Mountain rural, Waterloo, York Rural には特筆すべき産業、商業、教育施設等に分類される需要家は無く、総て Domestic Housing 需要家としてサンプルを無作為に抽出した。合計サンプル数は 200 である。

尚、調査を通してサンプルを無作為に抽出するに当たっては、NPA の需要家及び非需要家の双方とも、可能な限り公平な地理学上の広がりを得るようにした。また抽出されたサンプルの名前がダブっていたり、サンプルが引っ越していたり、メーターの名義が変わっていたりしたときは不足数を補うため代替のサンプルを調査員が抽出した。

以下、調査結果の概要を添付 4-1 に、調査アンケートの標準書式を含む現地再委託先が作成した調査報告書の概要を添付 4-2 にしめす。

## 添付 4-1 調査結果概要

## 調査結果（1）； Domestic Consumers (T1)

Area	調査 件数 (軒)	NPA 供給 時間 (時間/日)	NPA 電力消 費量/月 (kWh)	月間電気代 支払額 (Leones)	電気料金 支払意思 (Yes)	支払増加可 能額(Leones)	合計居住 人数 (人)	保有電気 器具合計 容量(W)	発電機保 有(Yes)	発電機容 量(kW)	燃料 消費量 (gallons/ 月)	発電機 燃料代 (Leones/月)	発電機 機材価格 (千 Leones)
11 East-1	8	42 (5.3)	507 (63)	335,000 (41,875)	8 (100%)	240,000 (30,000)	49 (6.1)	8,120 (1,015)	4 (50%)	5.66 (0.7)	18 (2.3)	225,000 (28,125)	3,500 (437.5)
12 East-2	9	65 (7.2)	1,036 (115)	880,944 (97,883)	9 (100%)	565,924 (62,880)	85 (9.4)	9,340 (1,037.8)	5 (55.6%)	6.56 (0.7)	53 (5.9)	662,500 (73,611)	4,592 (510.2)
13 East-3	8	63 (7.9)	322 (40)	481,618 (60,202)	9 (112.5%)	309,230 (38,654)	116 (14.5)	16,140 (2,017.5)	9 (112.5%)	15.96 (2)	136 (17)	1,700,000 (212,500)	12,500 (1,562.5)
21 West-1	8	91 (11.4)	394 (50)	430,000 (53,750)	8 (100%)	85,000 (10,625)	44 (5.5)	13,735 (1,716.9)	4 (50%)	5.6 (0.7)	44 (5.5)	550,000 (68,750)	4,992 (624)
22 West-2	8	85 (10.6)	4,894 (612)	1,740,000 (217,500)	8 (100%)	292,000 (36,500)	61 (7.6)	9,825 (1,228.1)	5 (62.5%)	12.84 (1.6)	67 (8.4)	837,500 (104,688)	12,991 (1,623.9)
23 West-3	9	73 (8.1)	1,783 (198)	1,629,722 (181,080)	8 (88.9%)	774,504 (86,056)	57 (6.3)	29,825 (3,313.9)	6 (66.7%)	13.1 (1.5)	121 (13.4)	1,506,250 (167,361)	12,534 (1,392.7)
31 Central-1	10	128 (12.8)	3,676 (368)	1,039,697 (104,000)	10 (100%)	392,050 (39,205)	79 (7.9)	11,491 (1,149.1)	4 (40%)	8.4 (0.8)	52 (5.2)	650,000 (65,000)	6,208 (620.8)
32 Central-2	10	62 (6.2)	1,112 (111)	1,014,200 (101,420)	7 (70%)	326,300 (32,639)	43 (4.3)	28,272 (2,827.2)	5 (50%)	8.16 (0.8)	111 (11.1)	1,387,500 (138,750)	7,938 (793.8)
Total	70	609	13,726	7,551,181	67 (95.7%)	2,985,008	534	126,748	42 (60%)	76.28	602	7,518,750	65,255
Average (軒)		8.7	196	107,874		42,643	7.6	1,810.7		1.1	8.6	107,410	932.2
Maximum (軒)		12.8	368	217,500		86,056	14.5	3,313.9		2	17	212,500	1,623.9
Minimum (軒)		5.3	40	41,875		10,625	4.3	1,015		0.7	2.3	28,125	437.5

[備考-1] 括弧内の数字は1軒ごとの数値を表している。

[備考-2] 各地域毎の収入の分布は以下の通り（金額は千レオン）

月額所得	分 布	East-I			East-II			East-III			West-I			West-II			West-III			Central-I			Central-II		
		分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均
低所得	0 – 350	3	525	175	2	350	175	1	175	175	6	1,050	175	2	350	175	1	175	175	1	175	175	1	1,050	175
中所得	351 – 650	4	2,022	506	5	2,528	506	7	3,539	506	2	1,011	506	6	3,033	175	7	3,539	506	3	1,517	506	1	1,011	506
高所得	651 – 1,500	1	826	826	2	1,651	826	-	-	-	-	-	-	-	-	-	1	826	826	6	4,953	826	1	1,651	826
計		8	3,373	422	9	4,529	503	8	3,714	464	8	2,061	258	8	3,383	423	9	4,540	504	10	6,645	665	1	3,712	371

[出所] JICA 調査団

## 調査結果（２）； Commercial Consumers (T2)

Area	調査 件数 (軒)	NPA 供給 時間 (時間/日)	NPA 電力 消費量/月 (kWh)	月間電気代 支払額 (Leones)	電気料金 支払意思 (Yes)	支払増加 可能額 (Leones)	合計居 住人数 (人)	保有電気 器具合計 容量(W)	発電機 保有(Yes)	発電機 容量 (kW)	燃料 消費量 (gallons/月)	発電機 燃料代 (Leones/月)	発電機 機材価格 (千 Leones)
11 East-1	8	37 (4.6)	592 (74)	380,626 (47,578)	7 (87.5%)	514,222 (64,278)	30 (3.8)	4,645 (580.6)	1 (12.5%)	2.72 (0.34)	4 (0.5)	50,000 (6,250)	2,600 (325)
12 East-2	9	66 (7.3)	437 (49)	476,058 (52,895)	8 (88.9%)	378,502 (42,056)	59 (6.6)	6,309 (701)	6 (66.7%)	8.79 (0.98)	98 (10.9)	1,225,000 (136,111)	8,817 (979.7)
13 East-3	9	78 (8.7)	50 (6)	656,030 (72,892)	9 (100%)	496,000 (55,111)	71 (7.9)	12,175 (1,352.7)	9 (100%)	17.81 (1.98)	253 (28.1)	3,162,500 (351,389)	19,514 (2,168.2)
21 West-1	8	63 (7.9)	1,225 (153)	1,346,150 (168,269)	8 (100%)	695,000 (86,875)	49 (6.1)	19,123 (2,390.3)	5 (62.5%)	14.8 (1.85)	124 (15.5)	1,550,000 (193,750)	11,742 (1,467.8)
22 West-2	9	70 (7.8)	2,701 (300)	1,628,575 (180,953)	8 (88.9%)	6,190,000 (687,778)	29 (3.2)	12,389 (1,376.6)	6 (66.7%)	137.6 (15.29)	566 (62.9)	29,000,000 (3,222,222)	62,826 (6,980.7)
23 West-3	8	113 (14.1)	4,093 (512)	5,666,830 (708,354)	13 (162.5%)	2,932,133 (366,517)	92 (11.5)	65,916 (8,239.5)	11 (137.5%)	135.91 (16.99)	1007 (125.9)	12,587,500 (1,573,438)	131,683 (16,460.4)
31 Central-1	10	83 (8.3)	779 (78)	1,713,000 (171,300)	8 (80%)	737,000 (73,700)	29 (2.9)	19,885 (1,988.5)	7 (70%)	20.2 (2.02)	146 (14.6)	1,825,000 (182,500)	21,902 (2,190.2)
32 Central-2	9	83 (9.2)	1,275 (142)	1,958,000 (217,556)	8 (88.9%)	1,215,000 (135,000)	82 (9.1)	53,068 (5,896.4)	8 (88.9%)	30.84 (3.43)	371 (41.2)	4,637,500 (515,278)	29,107 (3,234.1)
Total	70	593	11152	13,825,269	69 (98.6%)	13,157,857	441	193,510	53 (75.7%)	368.67	2569	7,518,750	288,191
Average (軒)		8.5	159	197,504		187,969	6.3	2,764.4		5.267	36.7	107,410	4,117
Maximum (軒)		14.1	512	708,354		687,778	11.5	8,239.5		16.99	125.9	212,500	16,460.4
Minimum (軒)		4.6	6	47,578		42,056	2.9	580.6		0.34	0.5	28,125	325

[備考-1] 括弧内の数字は1軒ごとの数値を表している。

[備考-2] 各地域毎の収入の分布は以下の通り（金額は千レオン）

		East-I			East-II			East-III			West-I			West-II			West-III			Central-I			Central-II		
月額所得		分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均	分 布	所得 計	平 均
低所得	0 – 350	5	875	175	4	700	175	-	-	-	2	350	175	4	700	175	-	-	-	3	525	175	-	-	-
中所得	351 – 650	2	1,011	506	4	700	175	2	1,011	506	2	1,011	506	3	1,517	506	-	-	-	-	-	-	2	1,011	506
高所得	651 – 1,500	1	826	826	1	826	826	7	5,779	826	4	3,302	826	2	1,651	826	8	6,604	826	7	5,779	826	7	5,779	826
計		8	2,712	339	9	2,226	247	9	6,790	754	8	4,663	583	9	3,868	430	8	6,604	826	10	6,304	630	9	6,790	754

[出所] JICA 調査団

調査結果（3）； Institutional Consumers (T3)

Area	調査件数(軒)	照明数(個)	コンセント数(個)	電気器具の総ワット量(kW)	代替エネルギーの消費量(gallons/月)	発電機機材価格(千 Leones)	発電機燃料代(Leones/月)	発電機容量(kW)	代替エネルギーの支払額(燃料・維持管理・潤滑油)(Leones)
11 East-1	8	332 (42)	97 (12)	20 (2)	244 (31)	32,780 (4,098)	3,050,000 (381,250)	25.60 (3.20)	8,018,000 (1,002,250)
12 East-2	6	162 (27)	60 (10)	5 (1)	300 (50)	174,500 (29,083)	3,750,000 (625,000)	44.56 (7.43)	4,126,200 (687,700)
13 East-3	9	560 (62)	444 (49)	126 (14)	1,353 (150)	1,116,727 (124,081)	16,912,500 (1,879,167)	364.40 (40.49)	19,009,500 (2,112,167)
21 West-1	10	262 (26)	118 (12)	22 (2)	284 (28)	54,200 (5,420)	3,550,000 (355,000)	24.50 (2.45)	4,720,000 (472,000)
22 West-2	8	380 (48)	483 (60)	120 (15)	2,450 (306)	641,300 (80,163)	30,625,000 (3,828,125)	296.00 (37.00)	31,489,000 (3,936,125)
23 West-3	6	194 (32)	128 (21)	66 (11)	1,372 (229)	697,150 (116,192)	17,150,000 (2,858,333)	161.90 (26.98)	18,860,000 (3,143,333)
31 Central-1	10	263 (26)	205 (21)	130 (13)	1,488 (149)	103,416 (10,342)	18,600,000 (1,860,000)	98.62 (9.86)	19,527,000 (1,952,700)
32 Central-2	8	985 (123)	499 (62)	259 (32)	1,688 (211)	709,000 (88,625)	21,100,000 (2,637,500)	237.60 (29.70)	24,529,000 (3,066,125)
Total	65	3,138	2,034	749	9,179	3,529,073	114,737,500	1253.18	130,278,700
Average (軒)		48	31	12	141	54,293	1,765,192	19.28	2,004,288
Maximum (軒)		123	62	32	306	124,081	3,828,125	40.49	3,936,125
Minimum (軒)		26	10	1	28	4,098	355,000	2.45	472,000

[備考] 括弧内の数字は1軒ごとの数値を表している。 [出所] JICA 調査団



調査結果（４）；Industrial Consumers (T4)

Area	調査件数(軒)	照明数(個)	コンセント数(個)	電気器具の総ワット量(kW)	発電機運転時間(hours)	代替エネルギーの消費量(gallons/月)	発電機機材価格(千 Leones)	発電機燃料代(Leones/月)	発電機容量(kW)	代替エネルギーの支払額(燃料・維持管理・潤滑油)(Leones)
11 East-1	9	479 (53)	245 (27)	1,402 (156)	7 (0.8)	5,081 (565)	1,639,551,468 (182,172,385)	63,512,500 (7,056,944)	1,464.24 (162.69)	72,310,501 (8,034,500)
12 East-2	9	603 (67)	239 (27)	1,682 (187)	8 (0.9)	10,161 (1,129)	3,945,423,527 (438,380,392)	127,012,500 (14,112,500)	2,503.20 (278.13)	137,709,167 (15,301,019)
13 East-3	5	659 (132)	615 (123)	156 (31)	5 (1.0)	4,188 (838)	1,314,684,280 (262,936,856)	52,350,000 (10,470,000)	1,152.24 (230.45)	61,710,000 (12,342,000)
21 West-1	4	116 (29)	152 (38)	0 (0)	1 (0.3)	1,621 (405)	874,875,008 (218,718,752)	20,262,500 (5,065,625)	160.00 (40.00)	25,062,500 (6,265,625)
22 West-2	1	200 (200)	250 (250)	0 (0)	1 (1.0)	520 (520)	90,562,500 (90,562,500)	6,500,000 (6,500,000)	96.00 (96.00)	7,346,000 (7,346,000)
23 West-3	8	516 (65)	317 (40)	105 (13)	8 (1.0)	5,630 (704)	329,302,800 (41,162,850)	70,375,000 (8,796,875)	1,134.40 (141.80)	74,671,000 (9,333,875)
31 Central-1	11	435 (40)	370 (34)	3 (0.3)	3 (0.3)	3,616 (329)	208,224,000 (18,929,455)	45,200,000 (4,109,091)	748.00 (68.00)	50,225,000 (4,565,909)
32 Central-2	8	2,227 (278)	1,670 (209)	698 (87)	17 (2.1)	12,854 (1,607)	4,639,661,444 (579,957,681)	160,675,000 (20,084,375)	2,755.00 (344.38)	224,263,000 (28,032,875)
Total	55	5,235	3,858	4,047	50	43,671	13,042,285,027	545,887,500	10,013.08	653,297,168
Average (軒)		95	70	74	1	794	237,132,455	9,925,227	182.06	11,878,130
Maximum (軒)		278	250	187	2.1	1,607	579,957,681	20,084,375	344.38	28,032,875
Minimum (軒)		29	27	0	0.3	329	18,929,455	4,109,091	40.00	4,565,909

[備考] 括弧内の数字は1軒ごとの数値を表している。 [出所] JICA 調査団

調査結果（５）； Domestic Consumers (Western Rural\_T1)

Area	調査 件数 (軒)	照明数 (個)	コンセ ント数 (個)	警備用 照明数 (個)	電気器 具の総 ワット 量(W)	電気料金 支払意思 (Yes)	支払意思額 (Leones)	合計居住 人数 (人)	予想電力 消費量 (W)	発電機保有 (Yes)	発電機 容量 (kW)	燃料 消費量 (gallons /月)	発電機 燃料代	発電機 機材価格 (千 Leones)
Mountain Rural	26	195 (7.5)	127 (4.9)	48 (1.8)	7,405 (285)	25 (96.2%)	1,083,000 (41,454)	293 (11.3)	66,750 (2,567)	18 (69.2%)	33 (1.3)	279 (10.7)	3,493,750 (134,375)	26,253 (1,010)
Koya	20	4 (0.2)	2 (0.1)	1 (0.1)	1,567 (78)	19 (95.0%)	2,290,000 (114,500)	276 (13.8)	109,125 (5,456)	6 (30.0%)	9 (0.5)	78 (3.9)	975,000 (48,750)	7,504 (375)
Waterloo	80	475 (5.9)	381 (4.8)	129 (1.6)	39,235 (490)	79 (98.8%)	6,038,000 (75,475)	715 (8.9)	200,865 (2,511)	50 (62.5%)	6,217 (77.7)	1,152 (14.4)	17,658,750 (220,734)	107,273 (1,341)
York Rural	74	364 (4.9)	208 (2.8)	48 (0.6)	31,530 (426)	73 (98.6%)	4,035,800 (54,538)	616 (8.3)	151,740 (2,051)	59 (79.7%)	59 (0.8)	633 (8.6)	8,100,000 (109,459)	45,899 (620)
Total	200	1,038	718	226	79,737	196 (98.0%)	13,446,800	1,900	528,480	133 (66.5%)	6,318	2,142	30,227,500	186,929
Average (軒)		5	4	1	399		67,234	10	2,642		32	11	151,138	935
Maximum (軒)		7.5	4.9	1.8	490		114,500	13.8	5,456		77.7	14.4	220,734	1,341
Minimum (軒)		0.2	0.1	0.1	78		41,653	8.3	2,051		0.5	3.9	48,750	375

[備考] 括弧内の数字は1軒ごとの数値を表している。 [出所] JICA 調査団

**添付 4-2 電力需要及び支払意思額の  
調査報告書概要  
(調査アンケートの標準書式等)**

**SUMMARY OF THE SURVEY FOR  
ELECTRICITY DEMAND  
AND  
WILLINGNESS - TO - PAY  
ON  
THE MASTER PLAN STUDY ON POWER SUPPLY  
IN WESTERN AREA  
IN  
THE REPUBLIC OF SIERRA LEONE**

**CONDUCTED BY  
PENINSULAR GROUP OF COMPANIES (S.L.) LTD**

# CONTENTS

- 1. Survey Method..... 1
- 2. Form of the Questionnaire ..... 3
- 3. Result of the Survey..... 10

## 1. Survey Method

### Method of Random Sampling

Sampling is conducted by means of special sampling procedures to employed for the individual target “Parent Population” as explained below.

The customer list of National Power Authority (NPA) is used as The Registrar of all customers for sampling, and simple random sampling is conducted for each of the four (4) Consumer Category using EXCEL Spreadsheet/Statistical Package with an empirical formula: “= **RANDO**” (37,992-1) + 1.

In cases of areas with Suspended Electrical Supply” and/or Un-electrified Areas, the Electoral Register used for the recently concluded Presidential and Parliamentary Elections held in August 2007 was used as The Register for Households for sampling purposes.

### Size of Mother Population for each Category of Sample

Mother Samples were taken from National Power Authority (NPA) Database consisting of **16,384** Consumers, which was then Down-sized to “**Actual Random Samples**” which were be utilized in the Electricity Demand and Willingness-to-Pay Survey. Consequently, we were able to identify Domestic Consumers (T1), Commercial Consumers (T2), Institution Consumers (T3), and Industrial Consumers (T4) as indicated below : -

	<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>T4</u>
Random Sample Size:	92	90	81	65
Actual Sample Size: (after Down-sizing)	70	70	65	55
Rural Areas:	200			

Concerning the Freetown Rural Areas (T1) identified randomly in the Survey, we tried as much as possible in obtaining a fair geographic spread for the collection of Data for both **NPA and Non-NPA Consumers**.

It is worthy of note to mention that in instances where the names were either duplicated or Consumers having moved away from the premises, as well as **Change of Meter Ownership**, etc our Enumerators and/or Supervisors were good enough to secure on-the-spot data from alternate NPA and Non-NPA Consumers as well as supplement the shortfall.

**Summary Table of Samples (T1, T2, T3, T4 and Rural Areas)**

<u>DISTRICT</u>	<u>WARD</u>	<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>T4</u>	<u>Total</u>
<u>Western</u>	Central 1	10	10	10	11	41
<u>Urban</u>	Central 2	10	9	8	8	35
	East 1	8	8	8	9	33
	East 2	9	9	6	9	33
	East 3	8	9	9	5	31
	West 1	8	8	10	4	30
	West 2	8	9	8	1	26
	West 3	9	8	6	8	31
	<b>Sub- Total</b>	<b>70</b>	<b>70</b>	<b>65</b>	<b>55</b>	<b>260</b>
<u>Western</u>	Koya	20				20
<u>Rural</u>	Mountain	26				26
	Waterloo	80				80
	York					
	Rural	74				74
	<b>Sub- Total</b>	<b>200</b>				<b>200</b>
<b>TOTAL</b>						<b>460</b>

## 2. Form of the Questionnaire

<b>DATE:</b>	<b><u>PENINSULAR GROUP OF COMPANIES</u></b>	<b>FORM # WU/D-C1</b>
/      /	DAY      MONTH      YEAR	
<b><u>ELECTRICITY DEMAND AND WILLINGNESS-to- PAY</u></b> <b><u>SURVEY IN THE WESTERN AREA</u></b>		
<b><u>T1 – DOMESTIC / T2 – COMMERCIAL CONSUMERS</u></b>		
A .CATEGORY OF PREMISES: T1 - DOMESTIC <input type="checkbox"/> T2 - COMMERCIAL <input type="checkbox"/>		
B. NAME OF CONSUMER: _____		
	LAST NAME	MIDDLE NAME      FIRST NAME
C. ADDRESS OF CONSUMER: _____		
D. ACCOUNT NUMBER: _____		
E. TYPE OF STRUCTURE: CONCRETE <input type="checkbox"/> BRICKS <input type="checkbox"/> WOODEN <input type="checkbox"/> SHEET METAL / PAN BODY <input type="checkbox"/>		
F. TYPE OF SUPPLY: PREPAID <input type="checkbox"/> SINGLE PHASE <input type="checkbox"/> THREE PHASE <input type="checkbox"/>		
G. AVERAGE No. OF HOURS OF ELECTRICITY SUPPLY FROM NPA: _____		
1. NO. OF LIGHTNING POINTS: _____ 2. NO. OF POWER POINTS: _____		
3. NO. OF SECURITY LIGHTS: _____		
4. ELECTRICAL APPLIANCES IN USE (see SEPARATE SHEET or ATTACHMENT)		
H. AVERAGE MONTHLY CONSUMPTION: _____ Kwh (Unit)		
I. AVERAGE MONTHLY PAYMENT(s) _____ Leones		
J. WHAT SOURCE OF ENERGY IS USED FOR COOKING ?		
1. KEROSENE <input type="checkbox"/> 2. COOKING GAS <input type="checkbox"/> 3. ELECTRICITY <input type="checkbox"/> 4. WOOD <input type="checkbox"/> 5. CHARCOAL <input type="checkbox"/>		
QTY / WEEK: _____		
K. WHAT SOURCE OF ENERGY IS USED FOR LIGHTING ? WHATS THE AVERAGE WEEKLY CONSUMPTION?		
1. NPA <input type="checkbox"/> 2. GEN SET – PET / DIE <input type="checkbox"/> 3. KEROSENE <input type="checkbox"/> 4. SOLAR <input type="checkbox"/>		
QTY / WEEK: _____		
L. AFFORDABLE ELECTRICITY PRICE PER KW/hr _____ Leone *		
M. ARE YOU PREPARED TO PAY MORE FOR 24 HOURS ELECTRIC SUPPLY: YES <input type="checkbox"/> NO <input type="checkbox"/>		
N. HOW MUCH MORE PER MONTH: LE _____		
O. WHAT IS THE SIZE OF HOUSE HOLD? _____		
P. WHAT IS THE INCOME LEVEL: LE _____		
Q. ANY OTHER COMMENTS:		
_____		
_____		



PENINSULAR GROUP OF COMPANIES

Form # WD-C1

APPENDIX TO QUESTIONNAIRE FORMS

1. IN CASE OF A NON-ELECTRIFIED AREA, PLEASE ASK THE CONSUMER TO PLEASE SPECIFY

I. WHAT KIND ELECTRICAL APPLIANCES THEY MAY WANT TO USE , AND

II. HOW MANY OF THE SAID ELECTRICAL APPLIANCES

LIST AS BELOW:

TYPE OF ELECTRICAL APPLIANCES	QUANTITY
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IF AND WHEN THERE WILL BE CONSTANT AND REGULAR NPA SUPPLY.

2. WHAT'S CONSUMERS OCCUPATION OR MAJOR SOURCE OF INCOME:

I. AVERAGE MONTHLY / ANNUAL INCOME:

LE \_\_\_\_\_ / MONTH OR LE \_\_\_\_\_ / YEAR.

3. THE NUMBER OF HOUSEHOLD MEMBERS:

MALE: \_\_\_\_\_ FEMALE: \_\_\_\_\_ TOTAL: \_\_\_\_\_

4. HOW MANY FAMILY UNITS ARE LIVING WITHIN THE HOME / HOUSE?

**PENINSULAR GROUP OF COMPANIES**

DATE:     /     /       
FORM #WU/I-C  
DAY MONTH YEAR

**ELECTRICITY DEMAND AND WILLINGNESS -to-PAY SURVEY IN THE WESTERN AREA**

**T3 – INSTITUTIONAL AND T-4 INDUSTRIAL CONSUMERS**

1. CATEGORY OF PREMISES: T3 – INSTITUTIONAL             T4 – INDUSTRIAL

2. NAME OF CONSUMER / BUSINESS: \_\_\_\_\_

3. ADDRESS OF CONSUMER / BUSINESS:  
\_\_\_\_\_  
\_\_\_\_\_

4. NPA ACCOUNT NUMBER: \_\_\_\_\_

5. TYPE OF SUPPLY: 220V     3 X 415V     11KV

6. SIZE OF TRANSFORMER(s): \_\_\_\_\_

7. METER SIZE: \_\_\_\_\_

8. NO. OF LIGHTING POINTS: \_\_\_\_\_

10. NO. OF POWER POINTS: \_\_\_\_\_

11. LIST OF PLANTS AND MACHINERIES (SEPARATE LIST ATTACHED)

12. LIST OF AUTO GENERATORS (SEPARATE LIST ATTACHED)

13. LIST OF ELECTRICAL APPLIANCES: (SEPARATE LIST ATTACHED)

- (A) SIZE OF AIR-CONDITIONER(s):
1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_

5. \_\_\_\_\_
6. \_\_\_\_\_

- (B) SIZE OF TEA KETTLE (s):
1. \_\_\_\_\_
  2. \_\_\_\_\_

(C) SIZE OF COMPUTER (s) (WITH CPU AND PRINTERS):

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_\_
- 8. \_\_\_\_\_
- 9. \_\_\_\_\_
- 10. \_\_\_\_\_

(D) SATELLITE / TV :

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

(E) SIZE OF CACULATING MACHINE: 1.

- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

14. OTHERS:

\_\_\_\_\_

\_\_\_\_\_

**PENINSULAR GROUP OF COMPANIES**  
**LIST OF ELECTRICAL APPLIANCES ( ATTACHEMENT )**

- 1. RADIO (SIZE/TYPE): \_\_\_\_\_
  - 2. TELEVISION: SMALL  MEDIUM  LARGE  EXTRA LARGE
  - 3. ELECTRIC COOKER: \_\_\_\_\_ KW
  - 4. ELECTRIC IRON: \_\_\_\_\_ W
  - 5. DVD / VCR PLAYER: \_\_\_\_\_ W
  - 6. \_\_\_\_\_ DESK \_\_\_\_\_ TOP \_\_\_\_\_ COMPUTER \_\_\_\_\_ With \_\_\_\_\_ CPU \_\_\_\_\_ &  
PRINTER: \_\_\_\_\_
  - 7. REFRIGERATOR (S): SMALL  MEDIUM  LARGE  EXTRA LARGE   
QUANTITY: \_\_\_\_\_
  - 8. FREEZER (S): SMALL  MEDIUM  LARGE  EXTRA LARGE   
QUANTITY: \_\_\_\_\_
  - 9. AIR CONDITIONER (S): WALL UNITS  SPLIT UNITS  PORTABLE UNITS   
QUANTITY: \_\_\_\_\_
  - 10. FAN (S): STANDING  WALL  CEILING  TABLE TOP   
QUANTITY: \_\_\_\_\_
  - 11. TEA KETTLE/WATER HEATER : \_\_\_\_\_
  - 12. SHOWER WATER HEATER: \_\_\_\_\_
  - 13. ELECTRIC TOASTER: \_\_\_\_\_
  - 14. MICROWAVE: \_\_\_\_\_
  - 15. AUDIO SYSTEMS: \_\_\_\_\_
- PRIVATE GENERATOR SET: YES / NO**
- a. TYPE OF ENGINE: PETROL  DIESEL
  - b. CAPACITY OF FUEL TANK: \_\_\_\_\_ GALLONS / LITRES
  - c. CONSUMPTION PER DAY / WEEK / MONTH: \_\_\_\_\_
  - d. SIZE OF GENERATOR: \_\_\_\_\_
  - e. COST OF REPAIRS / MONTH: \_\_\_\_\_
  - f. COST OF FUEL / MONTH: \_\_\_\_\_

**PENINSULAR GROUP OF COMPANIES**  
**LIST OF AUTO GENERATORS**

**1. TYPE OF ENGINE (S):**

(a) \_\_\_\_\_  
(b) \_\_\_\_\_  
(c) \_\_\_\_\_  
(d) \_\_\_\_\_

**2. FUEL CONSUMPTION (AS PER ABOVE):**

(a) \_\_\_\_\_  
(b) \_\_\_\_\_  
(c) \_\_\_\_\_  
(d) \_\_\_\_\_

**3. POWER OUTPUT (AS PER ABOVE):**

(a) \_\_\_\_\_  
(b) \_\_\_\_\_  
(c) \_\_\_\_\_  
(d) \_\_\_\_\_

**4. MAINTENANCE COST (AVERAGE PER MONTH):**

(a) \_\_\_\_\_  
(b) \_\_\_\_\_  
(c) \_\_\_\_\_  
(d) \_\_\_\_\_

**5. FUEL COST (PER UNIT):** (a) Petrol \_\_\_\_\_ (b) Diesel \_\_\_\_\_

**6. TYPES OF LUBRICANT (S):**

(a) \_\_\_\_\_  
(b) \_\_\_\_\_  
(c) \_\_\_\_\_

**7. COST OF LUBRICANT (S)**

(a) \_\_\_\_\_  
(b) \_\_\_\_\_  
(c) \_\_\_\_\_

**PENINSULAR GROUP OF COMPANIES**  
**LIST OF PLANTS AND MACHINERIES**

- 1. COMPRESSORS:
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
  - (c) \_\_\_\_\_
  - (d) \_\_\_\_\_
  - (e) \_\_\_\_\_
  - (f) \_\_\_\_\_
  - (g) \_\_\_\_\_
  - (i) \_\_\_\_\_
  
- 2. PUMPS:
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
  - (c) \_\_\_\_\_
  - (d) \_\_\_\_\_
  - (e) \_\_\_\_\_
  
- 3. MOTORS:
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
  - © \_\_\_\_\_
  - (d) \_\_\_\_\_
  - (e) \_\_\_\_\_
  - (f) \_\_\_\_\_
  - (g) \_\_\_\_\_
  - (h) \_\_\_\_\_
  
- 4. FANS:
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
  - (c) \_\_\_\_\_

5. OTHER RELATED INFORMATION:  
\_\_\_\_\_  
\_\_\_\_\_

### 3. Result of the Survey

#### SUMMARY TOTAL OF SORTED T1 DOMESTIC CONSUMERS

Area	Locality	Supply Hours / Day	Monthly Consumption / kWh	Monthly Payment (Leones)	Willingness	Payment Increase (Leones)	Payment Percentage Increase (%)	Household Size / Persons	Energy Consumed (Watts)	Generator Own
11	EAST 1	42	507	335,000	8	240,000	107.14	49	8,120	4
12	EAST II	65	1,036	880,944	9	565,924	106.62	85	9,340	5
13	EAST III	63	322	481,618	9	309,230	95.80	116	16,140	9
21	WEST I	91	394	430,000	8	85,000	23.36	44	13,735	4
22	WEST II	85	4,894	1,740,000	9	292,000	44.44	61	9,825	5
23	WEST III	73	1,783	1,629,722	8	774,504	111.04	57	29,825	6
31	CENTRAL 1	128	3,678	1,039,697	10	392,050	78.40	79	11,491	4
32	CENTAL II	62	1,112	1,014,200	7	326,300	41.41	43	28,272	5
<b>TOTALS:</b>		<b>609</b>	<b>13,726</b>	<b>7,551,181</b>	<b>68</b>	<b>2,985,008</b>	<b>76.03</b>	<b>534</b>	<b>126,748</b>	<b>42</b>
	AVG	76	1,716	943,898	9	373,126	76.03	67	15,844	
	MAX	128	4,894	1,740,000	10	774,504	111.04	116	29,825	
	MIN	42	322	335,000	7	85,000	23.36	43	8,120	
	MED	69	1,074	947,572	9	317,765	87.10	59	12,613	

#### T1 DOMESTIC CONSUMER FINAL SUMMARY

Area	Locality	Supply Hours / Day	Monthly Consumption / kWh	Monthly Payment (Leones)	Energy Consumed (Watts)	MCSE (Fuel / Gallon)	MPSE (Fuel + Maintenance Cost)	Generator Capacity (kW)	Unit Price Substitute Energy
11	EAST 1	42	507	335,000	8,120	18	325,000	5.66	12500 + Maintena
12	EAST II	65	1,036	880,944	9,340	53	752,500	6.56	12500 + Maintena
13	EAST III	63	322	481,618	16,140	136	1,810,000	15.96	12500 + Maintena
21	WEST I	91	394	430,000	13,735	44	645,000	5.60	12500 + Maintena
22	WEST II	85	4,894	1,740,000	9,825	67	947,500	12.84	12500 + Maintena
23	WEST III	73	1,783	1,629,722	29,825	121	1,786,250	13.10	12500 + Maintena
31	CENTRAL 1	128	3,678	1,039,697	11,491	52	725,000	8.40	12500 + Maintena
32	CENTAL II	62	1,112	1,014,200	28,272	111	1,657,500	8.16	12500 + Maintena
<b>TOTALS:</b>		<b>609</b>	<b>13,726</b>	<b>7,551,181</b>	<b>126,748</b>	<b>602</b>	<b>8,648,750</b>	<b>76.28</b>	
	AVG	76	1,716	943,898	15,844	75	1,081,094	9.54	
	MAX	128	4,894	1,740,000	29,825	136	1,810,000	15.96	
	MIN	42	322	335,000	8,120	18	325,000	5.60	
	MED	69	1,074	947,572	12,613	60	850,000	8.28	

**SUMMARY TOTAL OF SORTED T2 COMMERCIAL CONSUMERS**

Area	Locality	Supply Hours / Day	Monthly Consumption (kWh)	Monthly Payment (Leones)	Willingness	Payment Increase (Leones)	Payment Percentage Increase (%)	Household / Staff Size (Persons)	Energy Consumed (Watts)	Generator Own
11	EAST I	37	592	380,626	7	514,222	198.50	30	4,645	1
12	EAST II	66	437	476,058	8	378,502	100.88	59	6,309	6
13	EAST III	78	50	656,030	9	496,000	48.30	71	12,175	9
21	WEST I	63	1,225	1,346,150	8	695,000	56.61	49	19,123	5
22	WEST II	70	2,701	1,628,575	8	6,190,000	85.42	29	12,389	6
23	WEST III	113	4,093	5,666,830	13	2,932,133	32.38	92	65,916	11
31	CENTRAL I	83	779	1,713,000	8	737,000	60.78	29	19,885	7
32	CENTRAL 2	83	1,275	1,958,000	8	1,215,000	46.30	82	53,068	8
<b>TOTALS:</b>		<b>593</b>	<b>11,152</b>	<b>13,825,269</b>	<b>69</b>	<b>13,157,857</b>	<b>78.65</b>	<b>441</b>	<b>193,510</b>	<b>53</b>
	AVG	74	1,394	1,728,159	9	1,644,732	78.65	55	24,189	
	MAX	113	4,093	5,666,830	13	6,190,000	198.50	92	65,916	
	MIN	37	50	380,626	7	378,502	32.38	29	4,645	
	MED	74	1,002	1,487,363	8	716,000	58.69	54	15,756	

**T2 COMMERCIAL CONSUMERS FINAL SUMMARY**

Area	Locality	Supply Hours / Day	Monthly Consumption (kWh)	Monthly Payment (Leones)	Energy Consumed (Watts)	Monthly Consumption - MCSE (Fuel / Gallon)	MPSE (Fuel + Maintenance) (ost)	Generator Capacity (kW)	Unit Price Substitute Energy
11	EAST 1	37	592	380,626	4,645	4	75,000	2.72	12500 + Maintena
12	EAST II	66	437	476,058	6,309	98	1,312,000	8.79	12500 + Maintena
13	EAST III	78	50	656,030	12,175	253	3,357,500	17.81	12500 + Maintena
21	WEST I	63	1,225	1,346,150	19,123	124	1,845,000	14.80	12500 + Maintena
22	WEST II	70	2,701	1,628,575	12,389	566	39,160,000	137.60	12500 + Maintena
23	WEST III	113	4,093	5,666,830	65,916	1,007	15,297,500	135.91	12500 + Maintena
31	CENTRAL 1	83	779	1,713,000	19,885	146	2,290,000	20.20	12500 + Maintena
32	CENTAL II	83	1,275	1,958,000	53,068	371	5,717,500	30.84	12500 + Maintena
<b>TOTALS:</b>		<b>593</b>	<b>11,152</b>	<b>13,825,269</b>	<b>193,510</b>	<b>2,569</b>	<b>69,054,500</b>	<b>368.67</b>	
	AVG	74	1,394	1,728,159	24,189	321	8,631,813	46.08	
	MAX	113	4,093	5,666,830	65,916	1,007	39,160,000	137.60	
	MIN	37	50	380,626	4,645	4	75,000	2.72	
	MED	74	1,002	1,487,363	15,756	200	2,823,750	19.01	



**SUMMARY TOTAL OF SORTED T3 INSTITUTIONAL CONSUMERS**

Area	Locality	Total Lighting Points	Total Power Points	Machineries (Watts)	Appliances (Watts)	Total Wattage - Machineries & Appliances (Watts)	Monthly Consumption - MCSE (Fuel / Gallon)	Investment Cost (Leones)	Maintenance Cost / Month (Leones)	Fuel Cost / Month (Leones)
11	EAST 1	332	97	0	19,630	19,630	244	32,780,000	2,760,000	3,050,000
12	EAST II	162	60	0	4,580	4,580	300	174,500,000	209,000	3,750,000
13	EAST III	560	444	3,125	123,280	126,405	1,353	1,116,726,500	1,165,000	16,912,500
21	WEST I	262	118	0	21,687	21,687	284	54,200,000	650,000	3,550,000
22	WEST II	380	483	31,565	88,860	120,425	2,450	641,300,000	480,000	30,625,000
23	WEST III	194	128	0	66,374	66,374	1,372	697,150,000	950,000	17,150,000
31	CENTRAL 1	263	205	49,448	80,590	130,038	1,488	103,416,000	515,000	18,600,000
32	CENTRAL II	985	499	61,950	197,407	259,357	1,688	709,000,000	1,905,000	21,100,000
<b>TOTALS:</b>		<b>3,138</b>	<b>2,034</b>	<b>146,088</b>	<b>602,408</b>	<b>748,496</b>	<b>9,179</b>	<b>3,529,072,500</b>	<b>8,634,000</b>	<b>114,737,500</b>
AVG		392	254	18,261	75,301	93,562	1,147	441,134,063	1,079,250	14,342,188
MAX		985	499	61,950	197,407	259,357	2,450	1,116,726,500	2,760,000	30,625,000
MIN		162	60	0	4,580	4,580	244	32,780,000	209,000	3,050,000
MED		298	167	1,563	73,482	93,400	1,363	407,900,000	800,000	17,031,250

**T3 INSTITUTIONAL CONSUMERS FINAL SUMMARY**

Area	Locality	Energy Consumed (Watts)	Monthly Consumption - MCSE (Fuel / Gallon)	MPSE (Fuel, Maintenance & Lubricants)	Generator Capacity (kW)	Unit Price Substitute Energy
11	EAST 1	19,630	244	8,018,000	25.60	12,500
12	EAST II	4,580	300	4,126,200	44.56	12,500
13	EAST III	126,405	1,353	19,009,500	364.40	12,500
21	WEST I	21,687	284	4,720,000	24.50	12,500
22	WEST II	120,425	2,450	31,489,000	296.00	12,500
23	WEST III	66,374	1,372	18,860,000	161.90	12,500
31	CENTRAL 1	130,038	1,488	19,527,000	98.62	12,500
32	CENTRAL II	259,357	1,688	24,529,000	237.60	12,500
<b>TOTALS:</b>		<b>748,496</b>	<b>9,179</b>	<b>130,278,700</b>	<b>1,253.18</b>	
AVG		93,562	1,147	16,284,838	156.65	
MAX		259,357	2,450	31,489,000	364.40	
MIN		4,580	244	4,126,200	24.50	
MED		93,400	1,363	18,934,750	130.26	

**SUMMARY TOTAL OF SORTED T4 INDUSTRIAL CONSUMERS**

Area	Locality	Total Lighting Points	Total Power Points	Machinery Rating (kW)	Appliance Rating (kW)	Total Rating - Machinery & Appliances (kW)	Generator Availability	Monthly Consumption - MCSE (Fuel / Gallon)	Fuel Cost / Month (Leones)	Investment Cost (Leones)
11	EAST 1	479	245	1,402	217	1,619	7	5,081	63,512,500	1,639,551,468
12	EAST II	603	239	1,682	300	1,982	8	10,161	127,012,500	3,945,423,527
13	EAST III	659	615	156	501	657	5	4,188	52,350,000	1,314,684,280
21	WEST I	116	152	0	42	42	1	1,621	20,262,500	874,875,008
22	WEST II	200	250	0	43	43	1	520	6,500,000	90,562,500
23	WEST III	516	317	105	140	246	8	5,630	70,375,000	329,302,800
31	CENTRAL 1	435	370	3	207	210	3	3,616	45,200,000	208,224,000
32	CENTRAL II	2,227	1,670	698	320,637	321,335	17	12,854	160,675,000	4,639,661,444
<b>TOTALS:</b>		<b>5,235</b>	<b>3,858</b>	<b>4,047</b>	<b>322,088</b>	<b>326,134</b>	<b>50</b>	<b>43,671</b>	<b>545,887,500</b>	<b>13,042,285,027</b>
AVG		654	482	506	40,261	40,767		5,459	68,235,938	1,630,285,628
MAX		2,227	1,670	1,682	320,637	321,335		12,854	160,675,000	4,639,661,444
MIN		116	152	0	42	42		520	6,500,000	90,562,500
MED		498	284	131	212	451		4,635	57,931,250	1,094,779,644

**T4 INDUSTRIAL CONSUMERS FINAL SUMMARY**

Area	Locality	Total Rating - Machinery & Appliances (kW)	Monthly Consumption - MCSE (Fuel / Gallon)	MPSE (Fuel, Maintenance & Lubricants)	Generator Capacity (kW)	Unit Price Substitute Energy
11	EAST 1	1,619	5,081	72,310,501	1,464.24	12,500
12	EAST II	1,982	10,161	137,709,167	2,503.20	12,500
13	EAST III	657	4,188	61,710,000	1,152.24	12,500
21	WEST I	42	1,621	25,062,500	160.00	12,500
22	WEST II	43	520	7,346,000	96.00	12,500
23	WEST III	246	5,630	74,671,000	1,134.40	12,500
31	CENTRAL 1	210	3,616	50,225,000	748.00	12,500
32	CENTRAL II	321,335	12,854	224,263,000	2,755.00	12,500
<b>TOTALS:</b>		<b>326,134</b>	<b>43,671</b>	<b>653,297,168</b>	<b>10,013.08</b>	
AVG		40,767	5,459	81,662,146	1,251.64	
MAX		321,335	12,854	224,263,000	2,755.00	
MIN		42	520	7,346,000	96.00	
MED		451	4,635	67,010,251	1,143.32	

**SUMMERY TOTAL OF SORTED T1 RURAL CONSUMERS**

Locality	Total Lighting Points	Total Power Points	Total Security Lights	Connected Appliances (Watts)	Willingness to Pay	Proposed Payment Amount	Household Size / Persons	Proposed Power Load (Watts)	Generator Own	Monthly Consumption (Fuel / Gallon)
AREA 1 - MOUNTAIN RURAL	195	127	48	7,405	25	1,083,000	293	66,750	18	279
AREA 2 - KOYA WARD	4	2	1	1,567	19	2,290,000	276	109,125	6	78
AREA 3 - WATERLOO	475	381	129	39,235	79	6,038,000	715	200,865	50	1,152
AREA 4 - YORK RURAL	364	208	48	31,530	73	4,035,800	616	151,740	59	633
<b>TOTALS:</b>	<b>1,038</b>	<b>718</b>	<b>226</b>	<b>79,737</b>	<b>196</b>	<b>13,446,800</b>	<b>1,900</b>	<b>528,480</b>	<b>133</b>	<b>2,142</b>
AVG	260	180	57	19,934	49	3,361,700	475	132,120	33	535
MAX	475	381	129	39,235	79	6,038,000	715	200,865	59	1,152
MIN	4	2	1	1,567	19	1,083,000	276	66,750	6	78
MED	280	168	48	19,468	49	3,162,900	455	130,433	34	456

Maintenance Cost / Month (Leones)	Fuel Cost / Month (Leones)	Investment Cost (Leones)	Generator Capacity (kW)	Cooking Quantity (MJ)	MCSE - Cooking & Lighting (Leones)	MPSE - Cooking Energy (Leones)
926,000	3,493,750	26,253,200	33	81,901	348,008	1,585,661
325,000	975,000	7,504,070	9	25,931	25,944	1,021,593
1,990,000	17,658,750	107,273,160	6,217	145,965	121,328	2,060,898
2,150,000	8,100,000	45,899,035	59	140,917	140,879	2,544,253
<b>5,391,000</b>	<b>30,227,500</b>	<b>186,929,465</b>	<b>6,318</b>	<b>394,715</b>	<b>636,159</b>	<b>7,212,405</b>
1,347,750	7,556,875	46,732,366	1,580	98,679	159,040	1,803,101
2,150,000	17,658,750	107,273,160	6,217	145,965	348,008	2,544,253
325,000	975,000	7,504,070	9	25,931	25,944	1,021,593
1,458,000	5,796,875	36,076,118	46	111,409	131,104	1,823,280

**T1 RURAL CONSUMERS / USERS FINAL SUMMARY**

Locality	Connected Appliances (KW)	Proposed Payment Amount	Proposed Power Load (KW)	Generator Capacity (kW)	MCSE - Cooking & Lighting Energy (MJ)	MPSE - Cooking Energy (Leones)
AREA 1 - MOUNTAIN RURAL	7.41	1,083,000	66.75	32.96	348008.02	1585660.84
AREA 2 - KOYA WARD	1.57	2,290,000	109.125	9.06	25943.89	1021592.92
AREA 3 - WATERLOO	39.24	6,038,000	200.865	6217.46	121328.014	2060898.19
AREA 4 - YORK RURAL	31.53	4,035,800	151.74	58.84	140879.452	2544252.62
<b>Totals:</b>	<b>79.74</b>	<b>13,446,800</b>	<b>528.48</b>	<b>6318.32</b>	<b>636159.376</b>	<b>7212404.57</b>
AVG	19.93	3,361,700	132.12	1579.58	159039.844	1803101.143
MAX	39.24	6,038,000	200.865	6217.46	348008.02	2544252.62
MIN	1.57	1,083,000	66.75	9.06	25943.89	1021592.92
MED	19.47	3,162,900	130.4325	45.9	131103.733	1823279.515

## DESCRIPTION AND HEADER NOTES

<u>AREA (Wards in Western Urban Areas):</u>	11 – East 1, 12 – East 2, 13 – East 3, 21 – West 1, 22 - West 2, 23 – West 3, 31 – Central 1, 32 – Central 2
<u>SUPPLY HOURS/AY:</u>	Hours of availability of NPA Light
<u>MONTHLY CONSUMPTION:</u>	NPA <b>Energy</b> or Light Consumed Monthly in <b>KWh</b> as per NPA Billing
<u>MONTHLY PAYMENT:</u>	Payment to NPA for Energy or Light Consumed Monthly in Local Currency, <b>Leones</b>
<u>WILLINGNESS:</u>	Willingness of Consumer to pay Energy Provider for “ <b>Services</b> ” in the future, 1 – yes, 2 – No
<u>PAYMENT INCREASE:</u>	Extra Amount consumer is ready or willing to pay for Service, <b>Leones</b>
<u>PAYMENT PERCENTAGE INCREASE:</u>	Payment increase expressed as a percentage (%)
<u>HOUSEHOLD SIZE/PERSONS:</u>	Number of persons or individuals per household
<u>ENERGY CONSUMED:</u>	Total <b>Power</b> Rating as per List of Electrical Appliances ( <b>Watts</b> )
<u>GENERATOR OWNERSHIP:</u>	1- Yes, 2- No
<u>GENERATOR TYPE:</u>	1- Petrol, 2 – Diesel
<u>MONTHLY CONSUMPTION:</u>	Monthly consumption of Generator Fuel (in <b>Gallons</b> )
<u>MAINTENANCE COST:</u>	Monthly Cost of Generator Repairs in Local Currency, <b>Leones</b>
<u>FUEL COST:</u>	Monthly Cost Fuel consumed by Consumer Generator in Local Currency ( <b>Leones</b> )
<u>INVESTMENT COST:</u>	Purchasing Cost of Consumer Generator in Local Currency, <b>Leones</b>
<u>GENERATOR CAPACITY:</u>	Rating of Auto Generator ( <b>Kilo Watts</b> )
<u>TOTAL LIGHTING POINTSLIGHT:</u>	Number of Lights
<u>TOTAL POWER POINTS POWER:</u>	Number of Power Points
<u>MACHINERIES:</u>	Power Output of all Machinery and Plant ( <b>Watts</b> )
<u>APPLIANCES</u>	Combined Power of Electrical Appliance as per list provided ( <b>Watts</b> )
<u>LUBRICANT COST/MONTH:</u>	Monthly Cost of Lubricants in Local Currency, <b>Leones</b>
<u>AVAILABILITY</u>	Hours of Operation or Available Electricity
<u>MCSE:</u>	Monthly Consumption of Substitute Energy, <b>Gallons</b>
<u>MPSE:</u>	Monthly Payment of Substitute Energy, <b>Leones</b>
<u>COOKING QUANTITY:</u>	Quantity of Substitute Energy ( <b>MegaJoules or MJ</b> )
<u>MCSE COOKING &amp; LIGHTING ENERGY:</u>	Monthly Consumption of Substitute Energy ( <b>MegaJoules or MJ</b> )
<u>MPSE COOKING PAYMENT:</u>	Monthly Payment of Substitute Energy ( <b>Leones</b> )