

8.3.3 System 200Wp Kudumatse

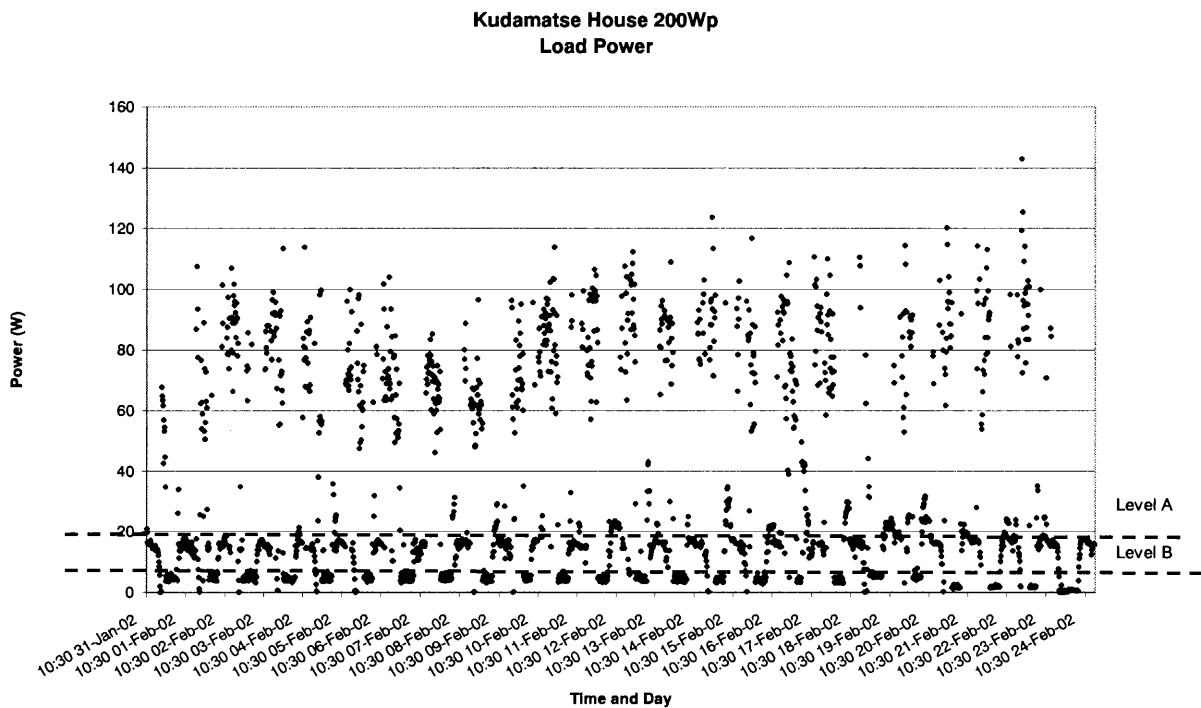
The data acquisition system that is installed at Kudumatse is described in Attachment 6 and 7.

Data sampling using the data acquisition system has been done in the following period and manner.

Typical time serious data and comments on than are introduced in the following paragraph.

Appendix Table 8.3-3 System 200Wp Kudumatse Sampling Data

Data/Time				Duration (Days)	Sampling Interval (min)	No. of Sampling Data
From		To				
31 Jun	10:30	24 Feb	16:15	24	15	2,327
7 Mar	16:42	17 May	4:39	71	60	1,702
17 May	16:06	5 Jul	3:36	49	30	2,328
18 Jul	14:43	16 Oct	9:43	90	60	2,155
Total				234		8,512

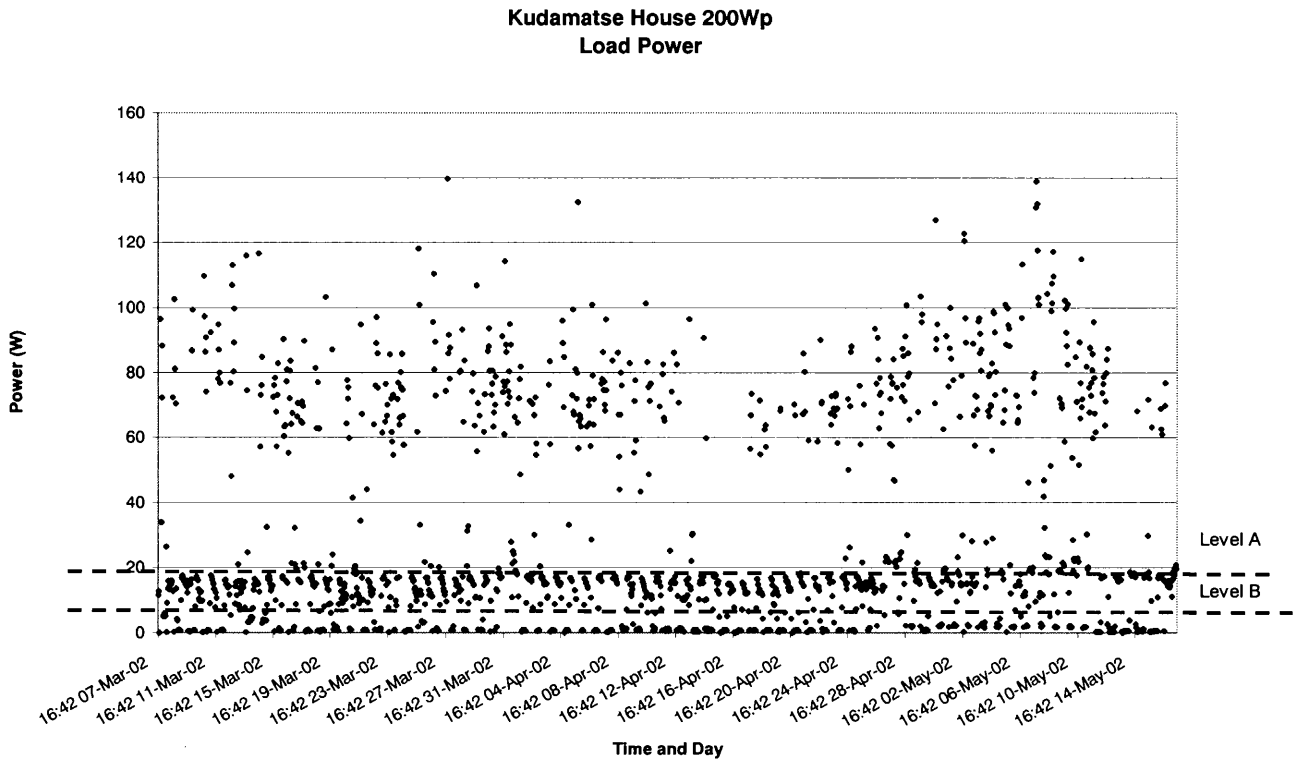


Appendix Figure 8.3-16 Kudamatse House 200Wp Load Power

Observations:

- * No load power consumption of the inverter at night-time is approximately 4 Watt (level B).

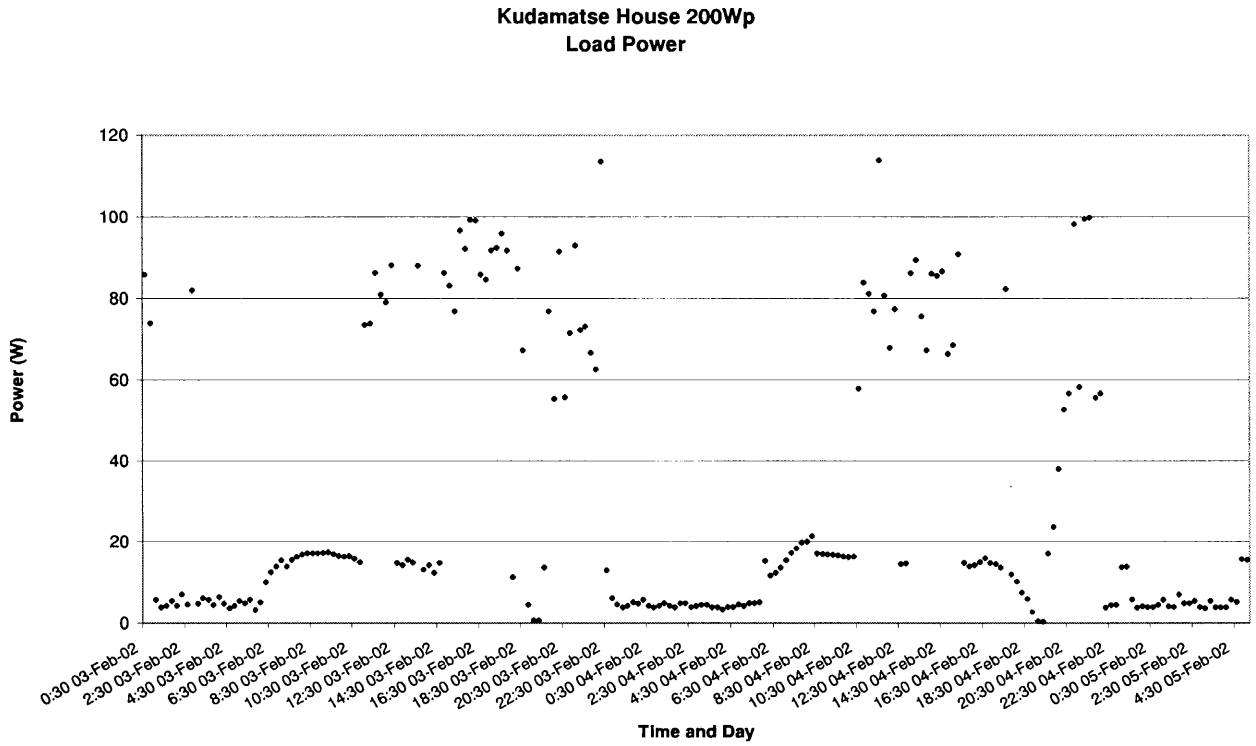
- * Maximum no load power consumption of the inverter at night-time is approximately 18 Watt (level A).
- * Inverter is almost continuously switched on.
- * Maximum load power consumption is 143 Watt.
- * System is used during daytime, as well as during the evening



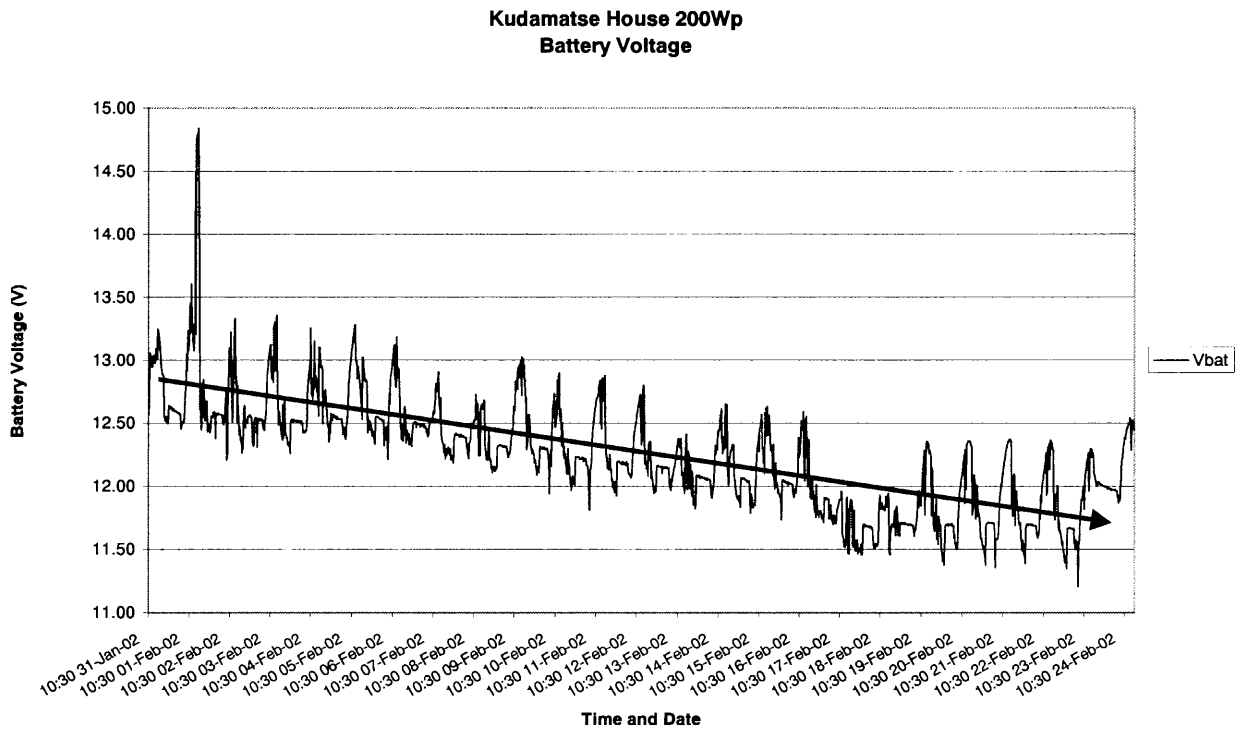
Appendix Figure 8.3-17 Kudumatse House 200Wp Load Power

Observations:

- * During this time period the inverter is switched off when not used (Appendix Figure 8.3-17)
- * Power consumption of the inverter in no load condition depends on the battery voltage (Appendix Figure 8.3-18)



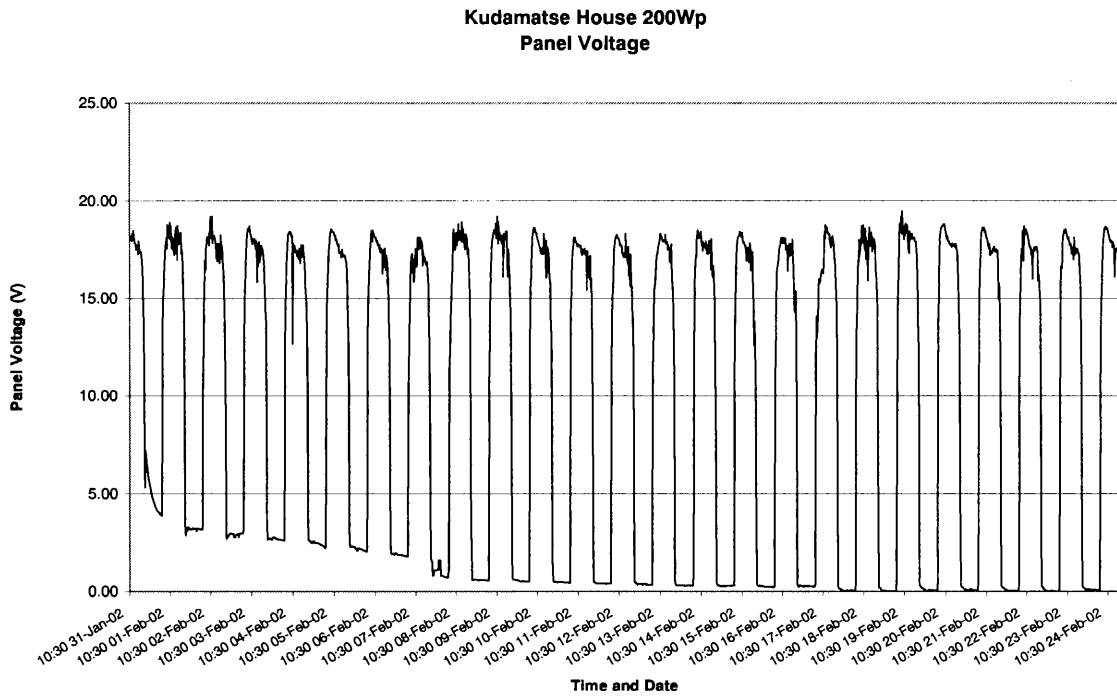
Appendix Figure 8.3-18 Kudumatse House 200Wp Load Power



Appendix Figure 8.3-19 Kudumatse House 200Wp Battery Voltage

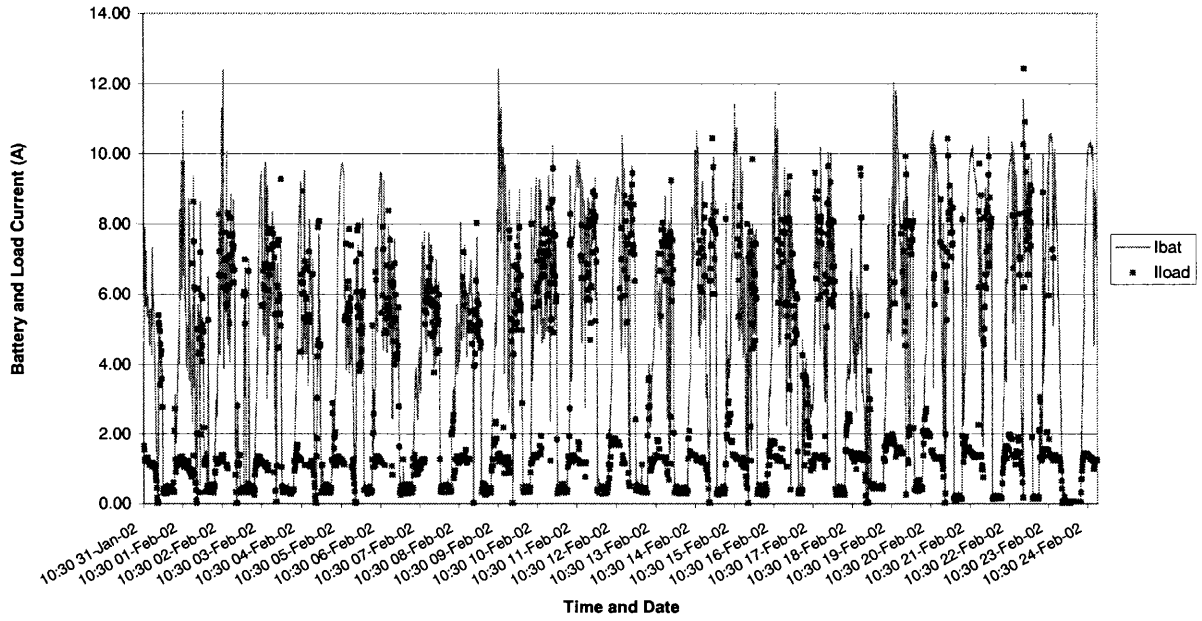
Observations:

- * Average battery voltage drops due to over-usage of the system (Appendix Figure 8.3-19). Later on the battery voltage increased again (not shown here).
- * Maximum panel voltage is approximately 18V, influence of moon is visible (Appendix Figure 8.3-20).



Appendix Figure 8.3-20 Kudumatse House 200Wp Panel Voltage

**Kudamatse House 200Wp
Battery and Load Current**

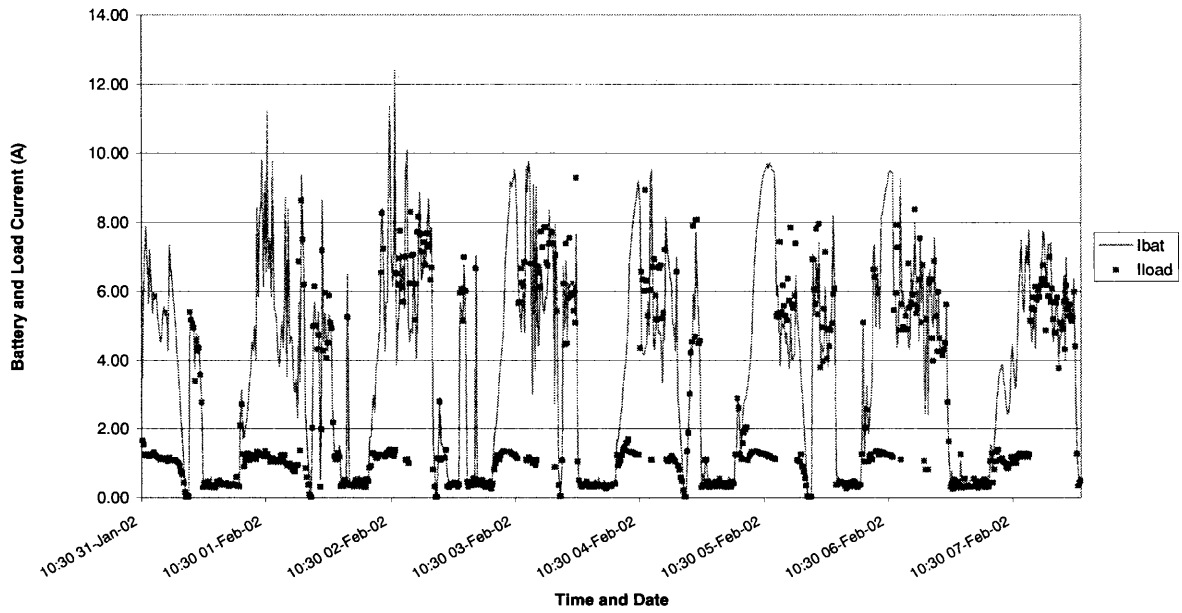


Appendix Figure 8.3-21 Kudamatse House 200Wp Battery and Load Current

Observations:

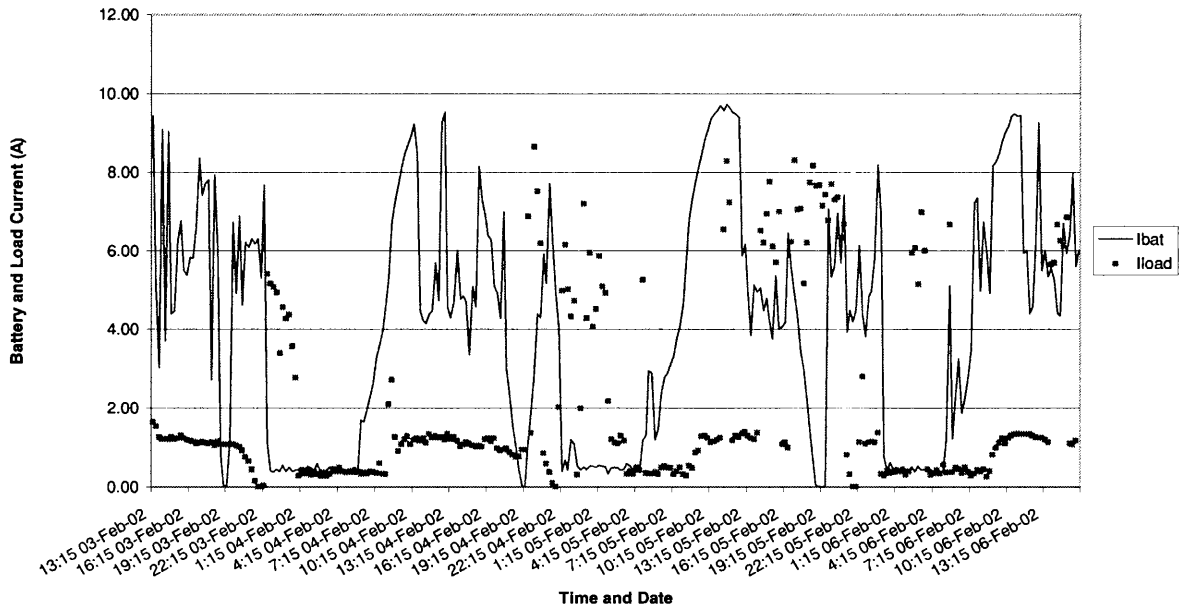
- * Panel current, which is equal to battery current when there is no load, is low for 200Wp system.
- * System is frequently used during daytime, inverter is not switched off (Appendix 8.3-21 and 22).

**Kudumatse House 200Wp
Battery and Load Current**



Appendix Figure 8.3-22 Kudumatse House 200Wp Battery and Load Current

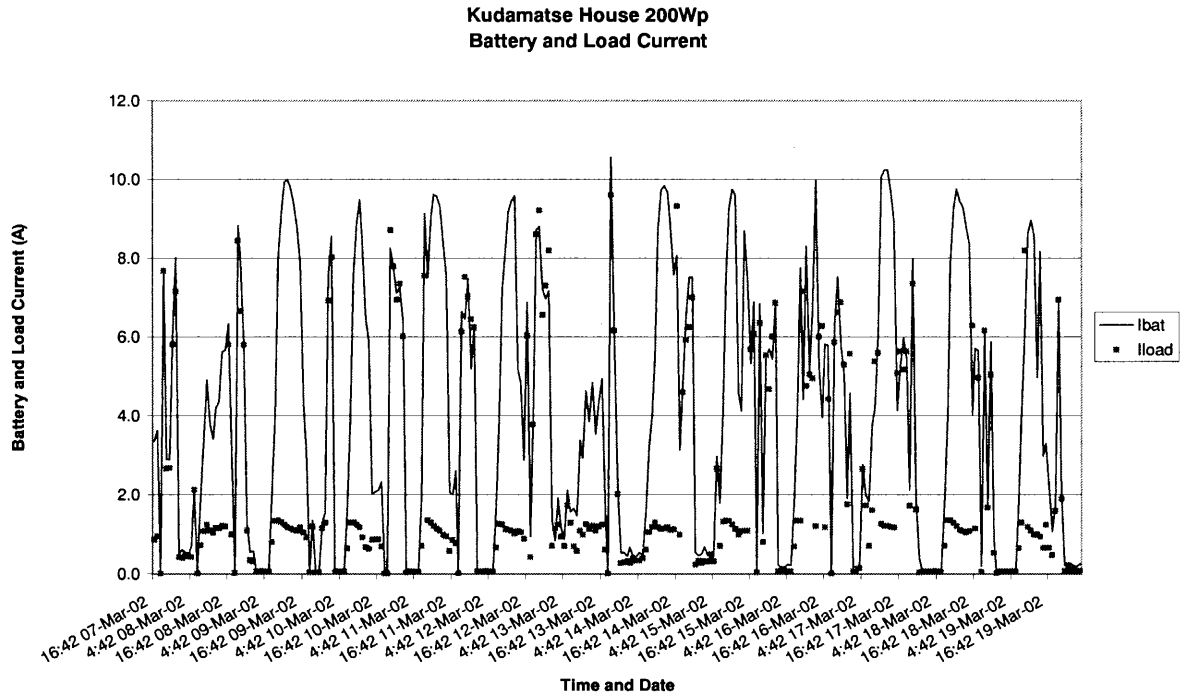
**Kudumatse House 200Wp
Battery and Load Current**



Appendix Figure 8.3-23 Kudumatse House 200Wp Battery and Load Current

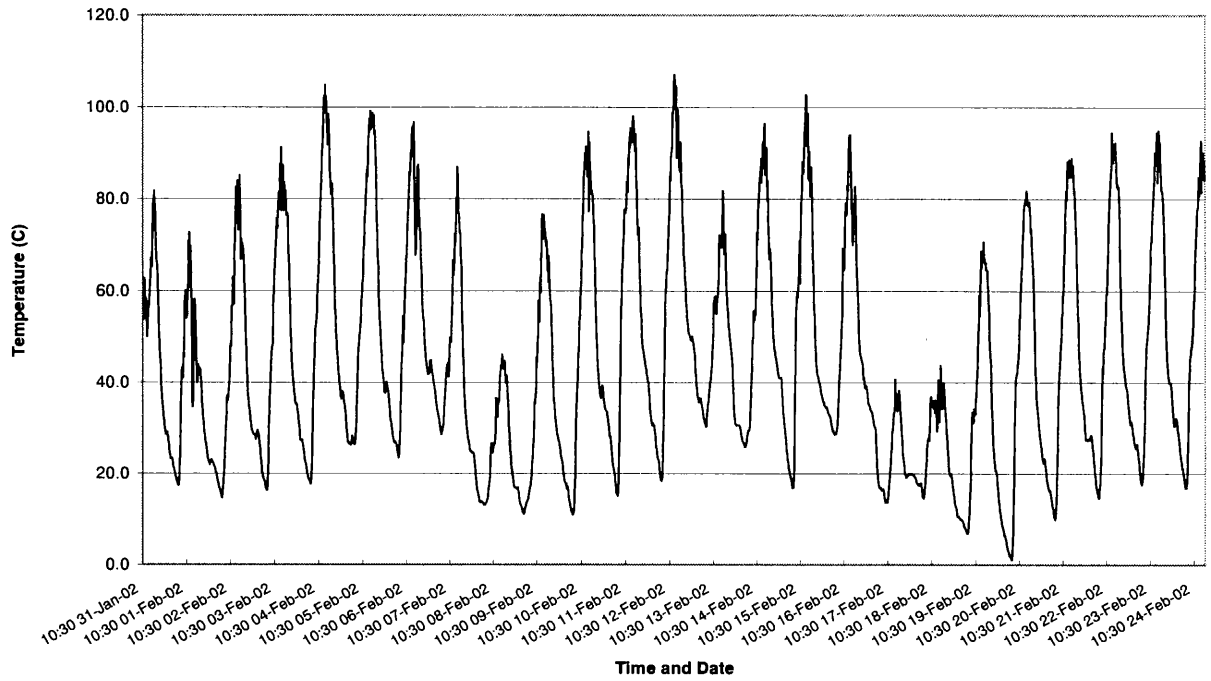
Observations:

- * System is frequently used during daytime, inverter switched on most of the time (Appendix Figure 8.3-23).
- * Inverter is switched off periodically (Appendix Figure 8.3-24).



Appendix Figure 8.3-24 Kudumatse House 200Wp Battery and Load Current

**Kudumatse House 200Wp
Temperature**



Appendix Figure 8.3-25 Kudumatse House 200Wp Temperature

Observations:

Large fluctuation between day and night temperatures

Attachment 1 Data Sheet of the Battery Charging Station

Operator Logbook Battery Charging Station Lorolwana FEBRUARY/APRIL 2002

= no entry

No.	Date	Time	Morning					Noon					Afternoon						
			No of Batteries on Charge	Left Voltage V1	Left Current A1	Right Voltage V2	Right Current A2	No of Batteries on Charge	Left Voltage V1	Left Current A1	Right Voltage V2	Right Current A2	No of Batteries on Charge	Left Voltage V1	Left Current A1	Right Voltage V2	Right Current A2		
1	15/Feb/02	08:00						11:55	26	18	8	20	14	05:00					
2	16/Feb/02	08:00	3	19	8	21	12	13:00	5	19	4	21	8	05:00	17	18	19	22	2
3	17/Feb/02	08:00	3	18	2	20	2	13:00						05:00					
4	18/Feb/02	08:00						13:00	18	18	10	19	10	05:00	17	18	18	4	4
5	19/Feb/02	08:00	15	17	8	18	6	13:00	3	20	0	23	0	05:00	6	19	0	2	0
6	20/Feb/02	08:00	3	19	0	22	0	13:00	2	18	0	21	0	05:00	3	18	0	21	0
7	21/Feb/02	08:00	2	19	0	22	0	13:00	2	18	0	21	0	05:00	2	19	0	22	0
8	22/Feb/02	08:00	3	19	0	22	0	13:00	3	19	0	21	0	05:00	3	19	0	22	0
9	23/Feb/02	08:00	3	19	0	22	0	13:00	3	17	0	20	0	05:00	1	18	0	21	0
10	24/Feb/02	08:00	2	17	0	21	0	13:00	1	19	0	21	0	05:00	1	19	0	21	0
11	25/Feb/02	08:00	4	19	0	22	0	13:00	2	19	0	22	0	05:00	2	17	0	20	0
12	26/Feb/02	08:00	5	18	4	19	8	13:00	2	19	0	21	4	05:00	1	18	2	21	0
13	27/Feb/02	08:00	0	16	0	18	0	13:00	0	20	0	23	0	05:00	0	19	0	22	0
14	28/Feb/02	08:00	0	19	0	22	0	13:00	0	19	0	22	0	05:00	0	19	0	22	0
15	01/Mar/02	08:00	0	19	0	23	0	13:00	0	18	0	21	0	05:00	1	18	0	21	0
16	02/Mar/02	08:00	1	18	2	22	0	13:00	1	18	0	20	4	05:00	1	17	2	21	0
17	03/Mar/02	08:00	1	17	2	21	0	13:00	1	18	0	20	4	05:00	1	18	0	20	2
18	04/Mar/02	08:00	2	18	8	23	0	13:00	2	18	6	22	0	05:00	33	17	14	17	14
19	05/Mar/02	08:00	35	16	8	17	6	13:00	40	17	20	19	22	05:00	40	16	4	17	4
20	06/Mar/02	08:00	39	16	4	17	4	13:00	41	17	20	19	22	05:00	42	16	2	16	2
21	07/Mar/02	08:00	42	16	8	17	6	13:00	42	16	6	17	8	05:00	42	16	6	16	4
22	08/Mar/02	08:00	42	17	12	17	8	13:00						05:00					
23	09/Mar/02	08:00	37	18	16	18	10	13:00	37	17	10	18	12	05:00	28	16	2	17	2
24	10/Mar/02	08:00	29	17	8	18	6	13:00	23	18	8	20	8	05:00	21	17	4	20	4
25	11/Mar/02	08:00	20	16	0	17	0	13:00	18	18	6	21	4	05:00	20	5	0	5	0
26	12/Mar/02	08:00	21	17	8	18	8	13:00	18	18	4	20	6	05:00	15	20	0	21	0
27	13/Mar/02	08:00	17	19	0	19	2	13:00	19	19	4	20	4	05:00	15	16	0	20	0
28	14/Mar/02	08:00	16	20	0	22	4	13:00						05:00	18	19	8	20	8
29	15/Mar/02	08:00	20	17	12	18	10	13:00	18	17	8	22	0	05:00	20	18	8	2	8
30	16/Mar/02	08:00	22	17	10	19	8	13:00	28	17	16	21	8	05:00	27	17	10	20	8
31	17/Mar/02	08:00	26	18	10	20	8	13:00	31	18	12	21	14	05:00	24	18	4	21	4
32	18/Mar/02	08:00	20	19	8	22	4	13:00	22	19	4	21	4	05:00	25	18	6	19	8
33	19/Mar/02	08:00	28	18	10	18	10	13:00	29	18	6	20	10	05:00	27	18	8	21	6
34	20/Mar/02	08:00	22	19	6	19	10	13:00	24	20	10	22	14	05:00	20	16	0	16	2
35	21/Mar/02	08:00	21	17	4	17	4	13:00	21	19	8	22	10	05:00	21	18	6	18	8
36	22/Mar/02	08:00						13:00						05:00					
37	23/Mar/02	08:00	26	18	10	21	4	13:00	26	16	4	19	4	05:00	26	16	2	18	2
38	24/Mar/02	08:00	25	18	8	20	4	13:00	20	19	2	21	10	05:00	18	19	2	21	4
39	25/Mar/02	08:00	18	20	2	22	0	13:00	21	18	10	22	6	05:00	20	18	8	22	4
40	26/Mar/02	08:00	21	19	8	22	6	13:00	21	18	10	21	12	05:00	20	18	8	20	6
41	27/Mar/02	08:00	27	17	10	17	10	13:00	26	18	10	20	16	05:00	21	17	2	17	2
42	28/Mar/02	08:00	17	19	10	20	10	13:00	18	18	12	20	14	05:00	16	17	2	17	2
43	29/Mar/02	08:00	12	19	12	21	8	13:00	12	19	0	21	4	05:00	11	19	0	21	4
44	30/Mar/02	08:00	12	20	4	21	10	13:00	14	18	8	20	8	05:00	14	17	0	17	2
45	31/Mar/02	08:00	15	18	8	18	8	13:00	17	18	16	20	16	05:00	16	17	8	18	8
46	01/Apr/02	08:00	14	18	10	20	10	13:00	9	18	12	21	8	05:00	10	17	2	18	2
47	02/Apr/02	08:00	12	18	12	18	10	13:00	10	18	8	20	10	05:00	12	18	10	19	10
48	03/Apr/02	08:00	16	18	12	8	12	13:00	18	19	6	20	20	05:00	15	19	2	19	8
49	04/Apr/02	08:00	17	20	4	19	10	13:00	18	19	2	21	18	05:00	20	18	8	20	4
50	05/Apr/02	08:00	18	18	10	21	4	13:00	14	18	12	21	12	05:00	14	17	8	19	8
51	06/Apr/02	08:00	18	18	12	20	10	13:00	13	18	10	21	4	05:00	15	18	10	19	10
52	07/Apr/02	08:00	17	18	16	18	12	13:00	14	17	2	19	6	05:00	11	18	4	20	6
53	08/Apr/02	08:00	16	17	12	19	8	13:00	15	18	8	22	4	05:00	11	17	4	18	4
54	09/Apr/02	08:00	16	18	12	19	10	13:00	15	18	8	18	8	05:00	22	18	6	18	4
55	10/Apr/02	08:00	27	18	12	19	10	13:00	27	18	18	21	21	05:00	20	18	8	19	6
56	11/Apr/02	08:00	22	18	10	20	8	13:00	20	18	8	20	16	05:00	17	18	4	18	6
57	12/Apr/02	08:00	16	17	4	17	2	13:00	22	17	6	18	8	05:00	24	16	0	18	2
58	13/Apr/02	08:00	29	17	8	18	6	13:00	33	16	6	18	6	05:00	32	16	0	17	2
59	14/Apr/02	08:00	42	17	14	19	10	13:00	32	19	16	21	18	05:00	26	16	0	17	2
60	15/Apr/02	08:00	39	17	8	17	6	13:00	24	19	6	20	20	05:00	19	17	6	18	4
61	16/Apr/02	08:00	24	18	12	18	8	13:00	22	18	18	20	18	05:00	26	17	10	18	8
62	17/Apr/02	08:00	26	17	12	18	10	13:00	29	18	10	19	21	05:00	23	17	4	18	4

Attachment 2 Data Analysis

Analysis period	# entries	No of Batteries on Charge	Left Voltage V1	Left Current A1	Right Voltage V2	Right Current A2	# entries	No of Batteries on Charge	Left Voltage V1	Left Current A1	Right Voltage V2	Right Current A2	# entries	No of Batteries on Charge	Left Voltage V1	Left Current A1	Right Voltage V2	Right Current A2
15 Feb-17 Apr	59	17.7	17.9	6.9	19.3	5.8	58	17.1	18.1	6.9	20.4	8.6	58	16.8	17.4	4.2	18.1	3.7
	Average >					Average >	Average >						Average >					
5 Mar-17 Apr	43	23.2	17.8	8.7	18.7	7.3	41	22.5	18.0	9.0	20.2	11.1	42	21.0	17.1	4.4	17.9	4.6
	Average >					Average >	Average >						Average >					

# of batteries	Bin	Frequency
0	0	0
0-5	5	0
6-10	10	0
11-15	15	5
16-20	20	15
21-25	25	8
26-30	30	8
31-35	35	1
36-40	40	3
41-45	45	3
More	More	0

Voltage at 13:00	Bin	Frequency
15 V	15	0
16 V	16	3
17 V	17	7
18 V	18	21
19 V	19	9
20 V	20	1
21 V	21	0
22 V	22	0
23 V	23	0
More	More	0

Left Voltage	Bin	Frequency
15	15	0
16	16	0
17	17	1
18	18	4
19	19	5
20	20	13
21	21	13
22	22	5
23	23	0
More	More	0

Right Voltage	Bin	Frequency
15	15	0
16	16	0
17	17	1
18	18	4
19	19	5
20	20	13
21	21	13
22	22	5
23	23	0
More	More	0

Current at 13:00	Bin	Frequency
0 A	0	1
0.1-2.5 A	2.5	3
2.6-5.0 A	5	4
5.1-7.5 A	7.5	7
7.6-10.0 A	10	15
10.1-12.5 A	12.5	4
12.6-15.0 A	15	0
15.1-17.5 A	17.5	3
17.6-20.0 A	20	4
20.1-22.5 A	22.5	0
More	More	0

Left current	Bin	Frequency
0	0	1
2.5	2.5	0
5	5	7
7.5	7.5	4
10	10	11
12.5	12.5	3
15	15	3
17.5	17.5	3
20	20	5
22.5	22.5	4
More	More	0

Right current	Bin	Frequency
0	0	1
2.5	2.5	0
5	5	7
7.5	7.5	4
10	10	11
12.5	12.5	3
15	15	3
17.5	17.5	3
20	20	5
22.5	22.5	4
More	More	0

