



Government of Assam  
**ASSAM ENGINEERING COLLEGE**  
JALUKBARI :: GUWAHATI - 781013  
Department of Electrical Engineering



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### **To Whom It May Concern**

This is to certify that the undersigned has successfully completed the audit of energy utilization of Dakshin Kamrup Girls' College, Mirza, Dist. Kamrup, Assam for the year 2022-2023.

The college has been taking lot of initiative to create awareness among the students, teachers and other stakeholders to make the college campus an energy efficient campus. Effort has been made to replace conventional electrical gadgets with energy efficient devices in a phased manner. The college has been taking initiative to install roof-top solar plant as alternative source of energy for producing electricity to meet certain demand. The location of many class rooms, departments and rooms for other academic purposes are such that sufficient natural light and air available during day time and as a result significant amount of electricity is saved.

I wish that Dakshin Kamrup Girls' College will emerge as an institute of Green Campus in the near future.

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Jalukbari, Guwahati-13

# ENERGY AUDIT REPORT

2022 - 2023

## DAKSHIN KAMRUP GIRLS' COLLEGE

MIRZA, DISTRICT: KAMRUP (Rural)

ASSAM, PIN: 781025

*Audited by*

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## I. Introduction:

Dakshin Kamrup Girls' College was established in the year 1988 and one of the pioneer institutes for girls' in the district of Kamrup, Assam. The college is located at a distance of 25 km to the west of the Guwahati City.

Energy Auditing is a routine procedure of monitoring energy consumption and conservation of industry/organization/institute and its analysis.

This report presents the energy audit of the D K Girls' College after verifying all electrical loads, its connections, protection schemes and optimal utilization of electricity.

## II. Electrical Load of the Campus:

The electricity supply to the college is provided by the Assam Power Distribution Company Limited. A 3-phase transformer was installed to transfer power to the college.

Consumer No.: 025000001388

Connected Load: 85 kW

Contracted Demand: 100 kVA

Tariff Category: HT- IV Bulk Supply (Govt. Education)

Supply Voltage Level: HT

Average Power Factor: 0.63

The following sections give details of electrical gadgets used by different academic and administrative blocks of the college.

### 1. ACADEMIC BLOCK:

#### (a) Department:

Sl No	Department	Fan	Light	Computer	Printer	UPS
1	Assamese	9	10(L)	1	1	
2	Home Science	3	2(T)	1		
3	Economics	2	2(T)	1		
4	English	3	3(T)	1	1	
5	Political Science	3	2(T)	1		
6	Education	3	3(T)	1		
7	Philosophy	3	2(T)	1		
8	History	3	2(L)	1		
9	Mass Communication	2	2(L)	6 (D)		

Note: L: LED bulb/tube, T: Tube with choke, D: Desktop computer

**(b) Class Rooms:**

Sl No	Class Rooms	Fan	Light	Digital Board	Audio syst	UPS
1	RCC Room 1	6	6(T)			
2	RCC Room 2	6	6(T)			
3	Mass Com. Class room	1	2(L)			
4	AT Room 1	5	5(L)			
5	AT Room 2	2	2(L)			
6	AT Room 3	5	4(L)			
7	AT Room 4	5	4(L)			
8	AT Room 5	2	2(L)			
9	AT Room 6	5	5(L)			
10	AT Room 7	4	2(L)			
11	AT Room 8	7	6(L)			
12	AT Room 9	9	8(L)			
13	AT Room 10	7	6(L)			
14	AT Room 11	4	4(L)			
15	AT Room 12	4	3(C)			
16	AT Room 13	4	1(L)			
17	Digital Class Room	2	24(L)		1	

Note: L: LED bulb/tube, T: Tube with choke, C: CFL

**(c) Laboratory:**

Sl No	Laboratory	Fan	Light	Computer	Printer/Projector	UPS
1	Education	4	2	1		
2	Computer	2	3(L)	8(D)	1+1	

**2. ADMINISTRATIVE BLOCK:**

Sl No	Type	Fan	Light	Computer	Printer	UPS
1	Principal's Room 1	1	2(T)	1(D)		
2	Principal's Room 2	2	4(L)	1(D)	1	
3	Principal's Room 3	2	3(L)			
4	Library	19	12(L)+6(T)	4(D)	1	2
5	IQAC	2	7(C)	2(D)	3	2
6	Office	3	3(T)+4(C)	3(D)	2	



### 3. OTHERS:

Sl No	Type	Fan	Light	Computer	Printer	UPS
1	Photocopy Room	1	1(L)	1		
2	Museum	4	3(T)			
3	Kitchen		2(L)			
4	Wash Rooms		8(L)			
5	Corridors	3	18(L)+15(T)			
6	Corridors (AT)		19(C)			
7	Girls' Common Room	5	3(L)+2(T)			
8	Student Union Room	1	2(T)			
9	Canteen	6	4(L)			
10	Science Building	31	21(L)			
11	Hostels	12	24(L)			
12	Cosmetic Market		2(L)			
13	Tailor	1	2(L)			
14	ATM		2(L)			

In addition to all the above gadgets, the following electrical appliances are also available in the college:

Sl No	Electrical Items	Rating	Quantity
1	Photocopy Machine		2
2	Air Conditioner	1 to 1.5 Ton	7
3	CC Camera		22
4	DG Set	40 kVA	1
5	Water Pump with motor	1 to 3 HP	5

### 4. Proposed electrical connections in the near future:

- A 3-storeyed building has already been constructed for a digital library and a computer lab with approximately 30 terminals. The digital library will include a conference room with centrally operated air conditioner. The computer lab includes battery back-up (UPS), AC and required number of fans and LED lights. Approximate connected load for the same is 10 KW.
- A new canteen building is also constructed for the college. It will include fans and LED bulbs. Approximate connected load for the same is 1 kW.

### Switches:

There are appropriate and sufficient numbers of MCBs and Isolators for maintaining and protecting the equipments.

## Outdoor Lighting:

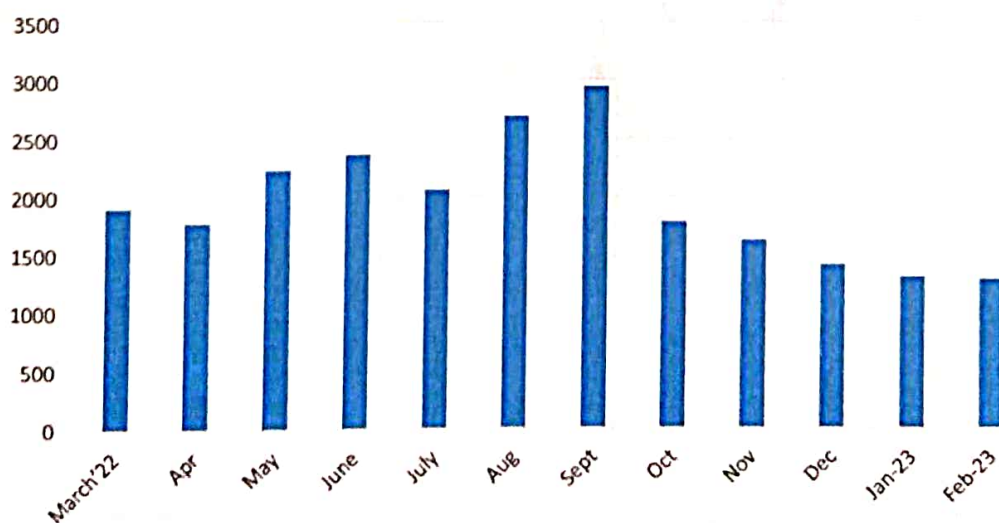
There are sufficient number of bulbs for outdoor lighting during night. It covers the entire college campus.

### III. ENERGY CONSUMPTION DATA AND ANALYSIS:

The trend of utilization of electrical gadgets and other appliances are reflected in the monthly bills of energy consumption. The energy consumption data are presented below for twelve months from March 2022 to February 2023. The trend is also illustrated pictorially.

Month	Energy consumption (kWh)	Avg. PF	Maximum Demand (kVA)	PF Penalty /Rebate (in kWh)	Tariff (in Rs.)	Monthly bills (in rupees)
March'22	1904.76	0.503	09.6	572.76	6.45	26812.00
April 22	1782.04	0.477	11.2	586.00	6.75	27129.00
May 22	2232.50	0.597	16.8	446.50	6.75	30693.00
June 22	2365.74	0.675	19.0	343.74	6.75	31608.00
July 22	2058.50	0.700	38.0	268.50	6.75	29469.00
Aug 22	2686.60	0.834	19.5	26.60	6.75	34829.00
Sept 22	2940.30	0.857	24.0	-29.70	6.75	36220.00
Oct 22	1787.52	0.724	14.0	191.52	6.75	10790.00
Nov22	1623.68	0.663	10.6	247.68	6.75	26494.00
Dec 22	1409.40	0.550	05.6	365.40	6.75	25394.00
Jan 23	1299.28	0.473	05.0	427.28	6.75	24840.00
Feb 23	1274.14	0.558	07.2	316.14	6.75	23200.00
<b>Total</b>	<b>23364.46</b>	<b>0.634</b>		<b>3762.42</b>		<b>327478.00</b>

Trend of Energy Consumption(kWh)  
(Mar 2022 - Feb2023)



From the above data, it is found that total energy consumption for the 12 month period from March 2022 to February 2023 is 23364.46 kWh including penalty. The amount of tariff paid during the period is Rs. 327478.00 and the penalty amount for the above 12 month period is Rs. 25224.50.

#### **IV. CONCLUSION**

This report presents a detail of electrical gadgets used in the college and its energy consumption. The location of many class rooms, departments and rooms for other academic purposes are such that sufficient natural light and air available during day time and as a result significant amount of electricity is saved. The college has taken steps to replace conventional electric bulbs with LED bulbs to save energy to some extent. It is suggested to replace all those conventional electric bulbs with LED bulbs in a phased manner. The average power factor is 0.63 which is not satisfactory and due to which the college had to pay large amount of penalty. For example, the college paid penalty of Rs. 25224.50 for the period of 12 months from March 2022 to February 2023. The college must take initiative to replace some old equipment to avoid penalty. The roof-top solar PV plant is another good alternative to save electricity as well as reduction of carbon emission.

The college has been taking lot of initiative to create awareness among the students, teachers and other stakeholders to make the college campus an energy efficient campus. The Green Energy Initiative is another sincere effort of the college for carbon neutrality. With the rising awareness on the necessity to save energy, the college has resorted to ways and means for saving electricity. Efforts have been made to shift to renewable energy phase wise. The e-waste of the college has been disposed as scrap and given away to concerned agencies for recycling.



# Sample Electricity Bill of D. K. Girls' College, Mirza



## Assam Power Distribution Company Limited

NAME OF ELECTRICAL SUB-DIVISION / IRCA : MIRZA ESD / IRCA GEC-II

CIN: U40109AS2003SGC007242

GSTIN: 18AAADCL1354J1ZJ

ELECTRICITY BILL

Amil 22

Website: www.apdcl.org

Centralized Customer Care Number: 1912

Consumer Name: The Principal Address: Dakshin Kamrup Girls College Mirza, GUWAHA	Consumer Number: 02500001388 Old Consumer Number: 6300003201 DTR Number: M079N000 Pole Number: 000 Connected Load in KW: 85.0 Contracted Demand in KVA: 100.0 Load Security: 257200.000 Meter Number: X0688124	Bill Amount: 27129.000 Due Date: 24-May-2022 Bil Number: 900023098 Bil Period: 01-Apr-2022 To 30-Apr-2022 Bil Date: 09-May-2022 Number of Days: 30 Meter Status: RUNNING Billing Status: NORMAL
Contact Number: 9365971719 Email: pack.umang@gmail.com Tariff Category: HT IV BULK SUPPLY (GOVERNMENT EDUCATION) Supply Voltage Level: Supply Voltage Level 11 KV	 02500001388	

### Meter Reading Details

Reading Type	Meter Number	MF	Previous Reading in KWh	Previous Export in KWh	Current Reading in KWh	Current Export in KWh	Difference Reading in KWh	Difference Export in KWh
KWH(Normal)	X0688124	200.0	254.830	0.000	260.810	0.000	5.980	0.000

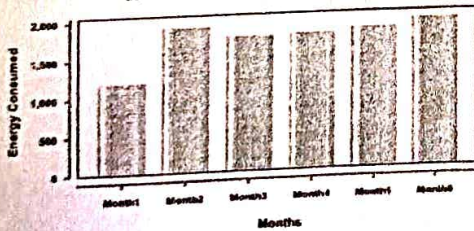
Units Consumed	PF Penalty/Rebate	LT Metering Penalty	DTR Penalty	HT Rebate	Voltage Rebate	Voltage Penalty	Billable Units in KWh
Normal   1196.0	586.040	0.000	0.000	0.000	0.000	0.000	1782.040
Recorded Demand (in KVA)	0.06	Maximum Demand (in KVA)		11.2	Billing Demand (in KVA)	Average Power Factor	47.700
Power on Hours	696				Availability Percentage		

### Billing Details

Current Demand	Outstanding Amount	Adjustment Amount	Solar Rebate	Net Bill Amount
Rs. 27128.830	Rs. 0.000	Rs. 0.000	0.000	Rs. 27129.830
In Words: Rupees Twenty Seven Thousand One Hundred Twenty Nine Only				

PLEASE PAY YOUR BILL ON TIME AND HELP US TO SERVE YOU BETTER

Energy Consumption (Last Month's Bill)



Charges Breakup	Units	Rate	Amount
Details			
Energy Charge(Normal)	1782.040	6.750	12028.770
Total Energy Charge			12028.770
Energy Charge Re-Estimated			0.000
RoofTop Solar Adjustment			0.000
Demand/Feed Charge (KVA)	100.0	140.0	13800.21
Electricity Duty			1291.85
Govt. Subsidy		0.0	0.0
Overdrawal Penalty			0.0
Meter Rent		0.0	0.0
Charges for dishonoured cheque			0.0
Arrear Principal			0.000
Arrear Surcharge			0.000
Current Surcharge			0.000
Adjustment Amount			0.000
Rebate if paid before due date			0.06
Payable amount before due date			27129.00
Payable amount after due date			27129.00

Checked by E&OE:

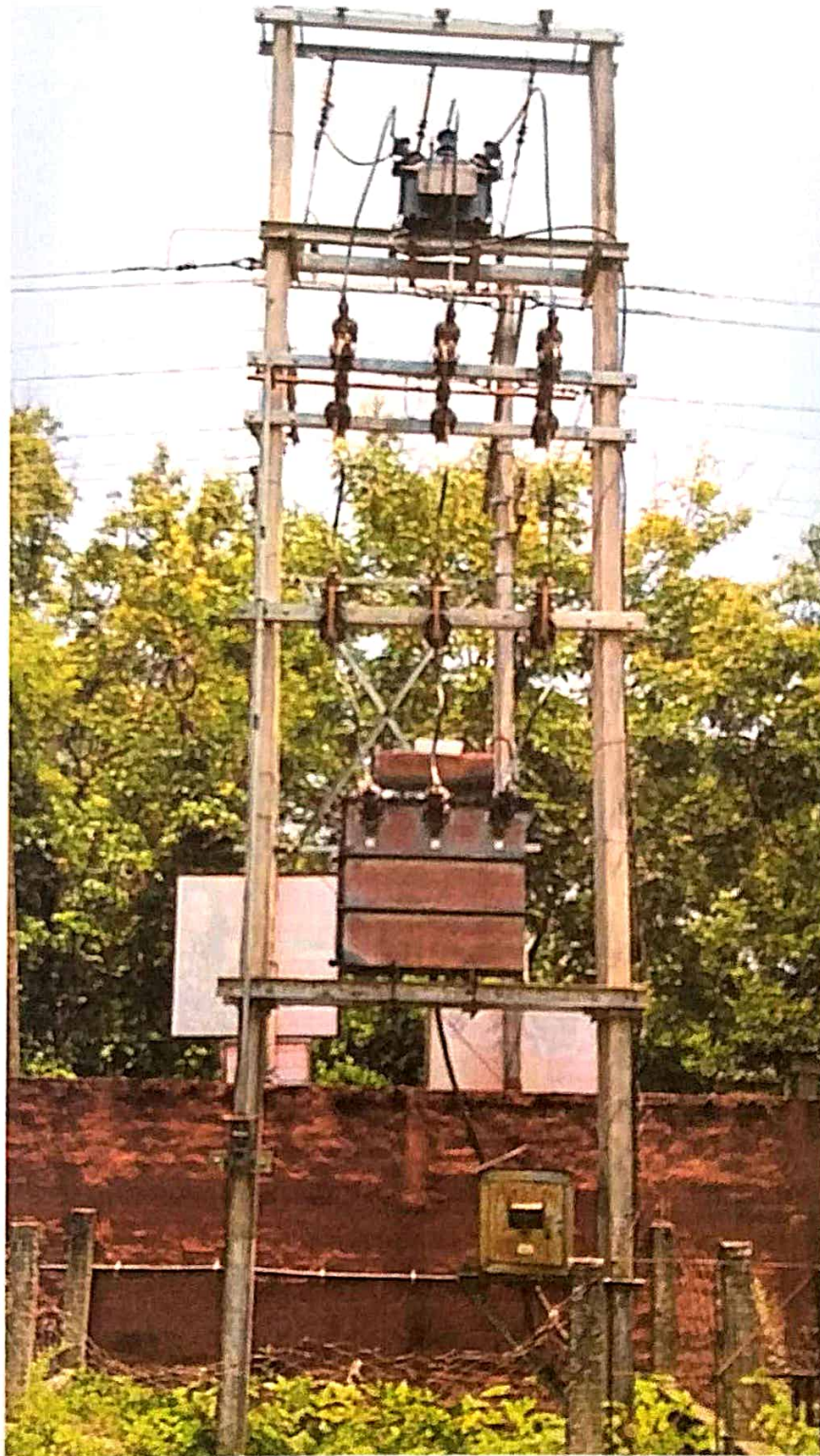
Prepared by: 40002068

Signature with seal

Area Manager  
 IRCA-II, APDCL (LAR)  
 GU Bypass, Gangaon, Jalukbari  
 P.O.-Pandu, Guwahati-781012



Transformer Connected to D. K. Girls' College, Mirza





**Water Treatment Plant of D. K. Girls' College, Mirza**





Newly installed DG Set of D. K. Girls' College, Mirza



*b.c.*

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