

**ENERGY AUDIT REPORT  
FOR  
Govt. College  
Kullu, Himachal Pradesh**



**Submitted By:**



**ECI CONSULTING ENGINEERS**

**M/s ECI Consulting Engineers**

**New Delhi**

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# 1. Acknowledgement

M/s ECI Consulting Engineers, New Delhi team has conducted Energy Audit of Govt College Kullu, Himachal Pradesh.

ECI hereby expresses sincere thanks to the team for their proactive support and courtesy extended to the audit team during the field study. We hereby also express our thanks to all college team members for their support during the field study. We hope that the recommendations/suggestions given in this report will help to reduce the present Energy & Water Consumption of the plant with reduced operational cost & save the environment.

Thanking You

A handwritten signature in blue ink, appearing to be 'MS' followed by a long horizontal stroke.

**Manjeet Singh**  
**Accredited Energy Auditor, BEE, MoP, GoI**  
**(AEA-0258)**

## 2. Introduction:

Situated on the right bank of river Beas, Govt. College Kullu provides a perfect ambiance for teaching learning activities. The glorious journey of the college began five decades ago in the year 1967 with 57 students. The opening of this institution of higher learning proved to be a boon for young men and women of Kullu district, Lahaul & Spiti and adjoining areas of Mandi district as prior to this they had to go to other places to pursue their studies. In 1971 classes in science stream also began. Within a span of nine years in 1976 the strength had increased manifold i.e. from 57 to 700. The college at present offers different under graduate programmes in Humanities, Science, Commerce, Computer Application and post graduate courses in English, Economics and Political Science. The college also runs self financing courses in BCA and BBA. In the year 2018 vocational courses in Retail Management and Tourism & Hospitality also began. This institution has emerged as one of the premier institutions of higher learning of Himachal Pradesh with a strength of about 5000. The college is covered by 2f & 12(B) by the UGC and has been reaccredited B++ by NAAC.

Spread over an area of 5 acres, the college has Science Block, Library and Administrative Block, New Arts Building which has a well equipped conference hall, multi-purpose hall, smart class rooms and canteen. Construction work of another building is in progress. The college has tribal hostels both for boys and girls. Solar panels have been installed on almost all buildings. The college provides facilities for indoor games along with gymnasium for exercise. Basket-ball court has also been constructed recently. The college has well equipped science labs and computer labs with internet facility. The college library which had 1067 books in 1967 now has more than 29000 books. The college library is registered for N-list programme of INFLIBNET. SOUL software has also been installed in the library. Construction of indoor stadium with the budgetary provision of more than 4 crore will start soon.

## 3. Energy Consumption

### 3.1 Electrical Energy Consumption details in GDC College:

The electricity supply for GDC College is provided by Himachal Pradesh State Electricity Board Limited (HPSEBL). The electricity supply is divided into 9 Nos electricity connections with separate energy meters in college campus which are as follows:

Table 1: Connected Load

Sr. No.	Block/Section	Connected Load (kW)
1	Science Block	12
2	Administration Block	36.64
3	Boys hostel	15
4	Girl hostel	80
5	Art block	55
6	Old girl hostel	5
7	IGNOU	2

Note: Administrative Block is having 3 Nos of Electricity Connections.

### 3.2 Major Sources of Electricity Consumption in the Campus:

Table 2: Lighting Inventory

Sr. No.	Location/Name of Room	Type of Light	Wattage (Watt)	Quantity	Annual Operating Hours
1	New girl hostel	Led tube	10	34	3840
		Led bulb	7	139	
2	Science block	Led tube	18	151	1440
		Led bulb	7	19	
3	Art block	Led tube	18	205	1440
		Led bulb	7	30	
4	Admin block	Led tube	18	76	1440
		Led bulb	7	15	
5	Old girl hostel	Led tube	18	74	1440
		Led bulb	7	19	
6	Boys hostel	Led tube	10	32	3840
		Led bulb	7	88	
7	IGNOU	Led tube	18	6	1440
		Led bulb	7	1	

Table 3: Fans Inventory

Sr. No.	Location/Name of Room	Type of Fan	Wattage (Watts)	Quantity	Star Rating	Annual Operating Hours
1	New Girl Hostel	Ceiling Fan	78	73	NA	1920
		Exhaust Fan	30	7	NA	1200
2	Science Block	Ceiling Fan	78	61	NA	720
		Exhaust Fan	30	9	NA	1440
3	Art Block	Ceiling Fan	78	108	NA	720
		Exhaust Fan	30	23	NA	1200
		Table Fan	50	1	NA	360
		Farrata Fan	65	12	NA	360
4	Admin Block	Ceiling Fan	78	36	NA	960
		Exhaust Fan	30	4	NA	1920
5	Old Girl Hostel	Ceiling Fan	78	34	NA	120
6	Boys Hostel	Ceiling Fan	78	73	NA	1920
		Exhaust Fan	30	2	NA	1920
7	IGNOU	Ceiling Fan	78	4	NA	720

Table 4: AC Inventory

Sr. No.	Location/Name of Room	Type of AC (Window/Split)	Tonnage (Ton)	Wattage	Quantity	Star Rating	Annual Operating Hours
1	Science block	Split	1.5	1600	1	3	300
2	Art block	Split	1.5	1600	6	3	300
3	Admin block	Split	1.5	1600	8	3	400
4	Old girl hostel	Split	1.5	1600	1	3	300

Table 5: Geyser's Inventory

Sr. No.	Location/Name of Room	Capacity (Ltrs)	Wattage (kW)	Quantity	Star Rating	Annual Operating Hours
1	New girl hostel	-	2.0	8	NA	-
2	Art block	-	-	-	-	-
3	Science block	25	2.0	1	NA	720
4	Admin block	-	-	-	-	-
5	Old girl hostel	-	-	-	-	-
6	Boys hostel	-	2.0	7	NA	1920
7	IGNOU	-	-	-	-	-

Table 6: Other Equipment Details

Sr. No.	Equipments	New Girls hostel	Admin. block	Old girls hostel	Science Block	IGNOU	Arts Block	Boys Hostel	Total
1	Room Heater	-	12	5	11	3	3	-	34
2	Computer	-	70	4	45	1	19	-	139
3	Printer	-	12	3	6	1	3	-	25
4	Photo state	-	1	-	1	-	-	-	2
5	LED Screen	1	4	2	-	1	1	1	10
6	Podium	-	2	1	7	-	7	-	17
7	Water purifier	1	-	-	1	-	2	-	4
8	Biometric	-	2	-	-	-	-	-	2
9	Microwave Oven	-	1	-	1	-	4	-	6
10	Fridge	1	-	-	3	-	3	1	8
11	Water pump	1	-	-	-	-	-	-	1
12	Water cooler	1	-	-	-	-	3	-	4
13	Incubator	-	-	-	2	-	-	-	2
14	IP	-	-	-	1	-	4	-	5
15	Projector	-	-	-	1	-	-	-	1
16	Water Bath	-	-	-	3	-	-	-	3
17	Vending Machine	5	1	2	2	-	4	-	14

### 3.2 Monthly Electricity Consumption Details for FY 2022-23

Table 7: Electricity Consumption

Month	Science Block	Administration Block (Library, BCA & Office)	Boys hostel	Girl hostel	Art block	Old girl hostel	IGNOU
	kWh	kWh	kWh	kWh	kWh	kWh	kWh
April-22	513	1960	1305	2718	3530	175	32
May-22	554	1890	1491	2718	3530	275	22
June-22	453	1921	861	858	2995	136	14
July-22	1168	2071	682	285	2830	151	40
Aug-22	1572	2125	1604	1375	3030	240	47
Sept-22	821	1766	1607	2669	2705	274	32
Oct-22	586	1518	1737	2521	2980	340	13
Nov-22	1170	1775	2037	3682	4635	275	9
Dec-22	0	1843	2759	5390	4205	506	61
Jan-23	1872	1394	1335	3112	2740	275	32
Feb-23	1364	1795	2114	4571	2420	282	30
Mar-23	1229	1913	2709	2718	3080	275	40
<b>Total</b>	<b>11302</b>	<b>21971</b>	<b>20241</b>	<b>32617</b>	<b>38680</b>	<b>3204</b>	<b>372</b>



Total Electrical Energy Consumption in GDC Campus in FY 2022-23 is **128387 KWh/Units**(as per electricity bills provided by GDC Administration).

## 4. Energy Conservation Measures Implemented in GDC

GDC has a dedicated Energy Club with Faculty and Students as its members. The club actively works to implement Energy Conservation measures and spread awareness on Energy Conservation in the campus and its vicinity.

Currently, GDC has adopted following Energy Saving methods in the campus:

- a. Installation of Rooftop Solar Power System for electricity and hot water requirements.
- b. Use of Solar LED Street Lights
- c. Use of energy efficient LED Bulbs & Tube lights instead of incandescent and CFL bulbs.
- d. Use of Solar Water Heaters
- e. Turn off electrical equipment when not in use.

### 4.1 GDC Installed a Rooftop Solar Power System in Science block

GDC has installed a rooftop solar power system in science block to reduce dependency and burden on requirement for supply of electricity from the grid. The specifications of the rooftop solar power system are as follows:

*Table 8: Installed Capacity*

Sr. No.	Name of Site	Capacity (kWp)
1	GDC KULLU, Arts building	28
2	GDC KULLU, Science block building	6
3	GDC KULLU, Library building	5
4	GDC KULLU, Boys Hostel Building	5



Figure 1: Solar Plant at Arts Block (28 kWp)

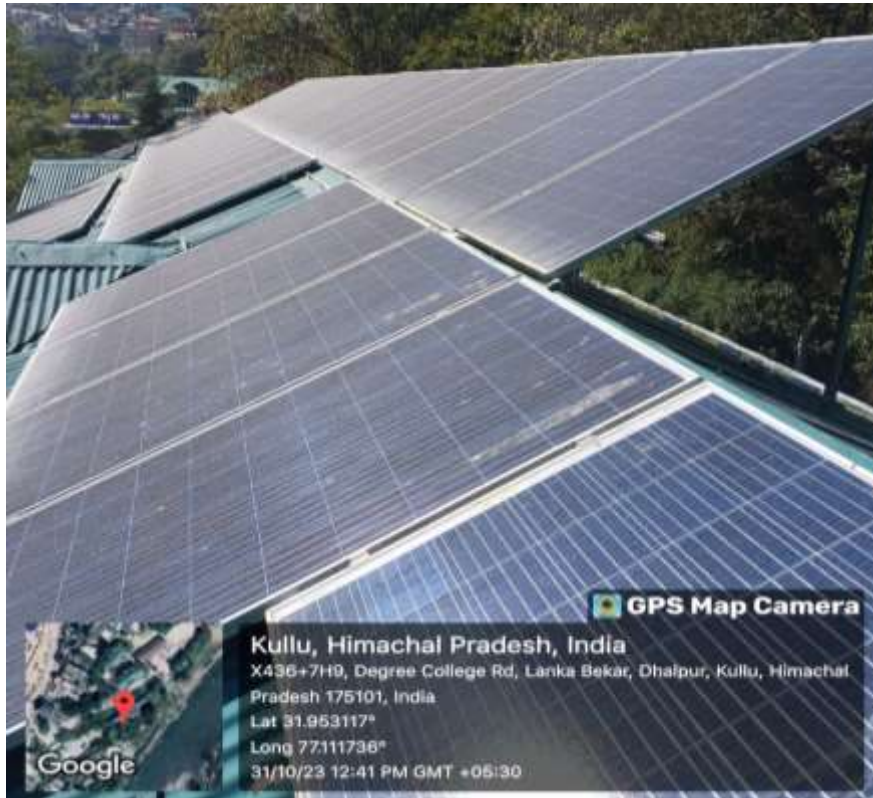


Figure 2: Solar Plant at Boys Hostel (5 kWp)



Figure 3: Solar Plant at Library & Science Block (11 kWp)

Table 9: Solar Energy Generation for FY 2022-2023

Sr. No.	Month	Total Solar Energy Generation (in KWh)
1	April-22	5010
2	May-22	4921
3	June-22	3705
4	July-22	3675
5	Aug-22	4943
6	Sep-22	4131
7	Oct-22	4428
8	Nov-22	4388
9	Dec-22	3638
10	Jan-23	4868
11	Feb-23	4949
12	Mar-23	6081
<b>TOTAL</b>		<b>54737</b>

## 4.2 GDC Installed Solar Water Heating System

GDC has also installed solar water heating system for daily hot water requirements of College which is accommodating 90 girls in 36 rooms. The system installed is sufficient to fulfil the hot water requirements of all of its occupants.





Figure 6:Solar Water Heater-3



Figure 7:Solar Water Heater-4

### 4.3 Solar LED Street Lights

GDC campus employs solar LED Street Lighting systems to reduce energy consumption.



Figure 8:LED Street Light



Figure 9: LED Street Light

#### 4.4 Replacement of Old CFL/Incandescent Bulbs with LED Lights



Figure 10: LED Light



Figure 11: LED Fog Light

## 5. Recommendations on Energy Conservation for the institution

The energy audit team visited the campus of GDC and after careful observations and monitoring of facilities and equipments made following recommendations to the administration:

- a. Use the “OFF” switch, rather than the “STAND BY” mode of equipments.
- b. Switch off lights, heater & other equipments when not in use.
- c. Use of Motion Sensors/Timers for lighting system
- d. Utilize team of energy club to spread awareness on Energy Conservation & organize activities at inter-college and intra college level to boost innovative thought process for Energy Conservation in young minds.
- e. Co-ordinate with govt departments and other schools and colleges and share best practices amongst themselves.
- f. Purchase BLDC Fan whenever replacement of Ceiling fan is required which consumes 50% less energy in comparison to conventional fans.
- g. Installation of more Solar plant as space is available in college
- h. Do necessary repairs and maintenance of the Solar Water Heating System at the earliest.
- i. Check for BEE star label before purchasing equipments, lights and other accessories.
- j. Use electricity efficiently & effectively.




## 6. AEA Certificate from Bureau of Energy Efficiency (BEE), MoP

 **BUREAU OF ENERGY EFFICIENCY**

Examination Registration No.: ..... **EA- 7295** .....

Accreditation Registration No.: ..... **AEA-0258** .....



### Certificate of Accreditation

This is to certify that Mr./Ms..... **Manjeet Singh** .....having its trade/registered office at ..... **Haryana** ..... has been given accreditation as accredited energy auditor. The certificate shall be effective from ..... **2<sup>nd</sup>** ..... day of **November, 2017** .....

The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No..... **0258** ..... in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this **12<sup>th</sup>** day of **February, 2018**

  
Secretary,  
Bureau of Energy Efficiency  
New Delhi