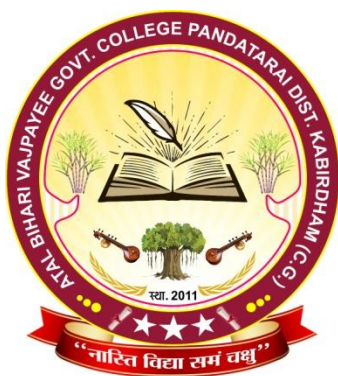


Atal Bihari Vajpayee Govt College Pandatarai,  
Kabirdham


**ENERGY AUDIT REPORT (2021-22)**



# Electricity Utility Bills

The following image shows the contract demand load of the office building:

Page



(यह बिल केवल सामान्य खपत के लिए है - पेनाल्टी/सतर्कता इकाई से संबंधित वसूली हेतु पृथक फार्म निर्धारित है।)

## छत्तीसगढ़ राज्य विद्युत वितरण कंपनी मर्यादित, विद्युत देयक (निम्नदाब हेतु)

1. सर्विस क्रमांक 1005670147		Last Payment of Rs 125000.00 on 03/08/2022	
2. बिल अवधि 2022/10	3. बिल क्रमांक 726013480961	4. बिल दिनांक 06/11/2022	चैक हेतु भुगतान हेतु अंतिम तिथि नगद हेतु
5. उपभोक्ता का नाम GOVT. COLLEGE .		18/11/2022	21/11/2022
6. पता ..... VILL CHARBHATA PANDATARAI PANDATARAI		29. न्यूनतम प्रभार	
		30. नियत/मांग प्रभार	5800.00
		31. ऊर्जा प्रभार	9361.00
7. दूरभाष क्रमांक 9644288773		32. योग (29 अथवा 30+31)	
8. मीटर क्रमांक		33. विद्युत शुल्क (ऊँची)	0.00
9. पोल क्रमांक		34. ऊर्जा विकास उपकर (सेस)	0.00
10. वितरण केन्द्र (नाम/पता/फोन) J.E.(O&M) Pandatari		35. मीटर किराया	35.00
11. प्रयोजन	12. टैरिफ श्रेणी LV2ND3SG21	36. वेल्डिंग/केपेसीटर अधिभार	0.00
13. विद्युत फेज	14. बिल आधार	37. वी.सी.ए. चार्ज	0.00
15. अनुबंध भार/मांग 29KW	16. वर्तमान रीडिंग 41849	38. अतिरिक्त सुरक्षा निधी देयक	0.00
17. वर्तमान रीडिंग दिनांक	18. पिछली रीडिंग 41849	39. विशेष रियायत राशि	0.00
19. पिछली रीडिंग दिनांक	20. गुणांक 1.0000	40. विकलन / आकलन समायोजन	0.00
21. पॉवर फॅक्टर वाचन 0	22. विद्युत खपत	41. कुल बिल	
23. उच्चतम मांग वाचन 0.0000	24. आंकलित खपत	42. सुरक्षा निधि बकाया	
25. सुरक्षा निधि जमा 20300	26. कुल खपत 0	43. पिछली बकाया राशि	86745.00
27. विगत 6 रीडिंग का ब्यौरा		44. अतिरिक्त	1.00-
वाचन माह	वाचन की तिथि	रीडिंग (वाचन)	
क.	2022/09	41849	3215
ख.	2022/08	38634	330
ग.	2022/07	38304	220
घ.	2022/06	38084	332
ङ.	2022/05	37752	0
च.	2022/04	37752	0
28. शिकायत हेतु संपर्क (क) श्री GANESH		Solar Roof Top:- Export Consumption:0 Export Purchase Amount:0.00 SD Interest 0	
(जुनियर इंजीनियर/सहायक पंजीयक) CHANDRA VIKAS B05			
(ख) सात दिवस में शिकायत का निराकरण न होने पर			
श्री CHANDRA SHEKHAR JAGNAYAK			
(सहायक पंजीयक/आकलन यंत्री) दूरभाष क्र. 96305-58605			
<p>महत्त्वपूर्ण सूचना :- 1) अनुबंध से बचने के लिये बिल का भुगतान शीघ्र कीजिये। अंतिम तिथि के बाद 15 दिन तक भुगतान न किये जाने पर बिजली काटने की कार्यवाही की जा सकती है। 2) सभी राशि रुपये पैसे में</p> <p style="text-align: center;">भुगतान की रसीद की मोहर</p>			
छत्तीसगढ़ राज्य विद्युत वितरण कंपनी मर्यादित (कार्यालयीन उपयोग हेतु)			
सर्विस क्रमांक	1005670147		
बिल क्रमांक	726013480961	बिल दिनांक	06/11/2022
चैक हेतु		भुगतान हेतु अंतिम तिथि	नगद हेतु
18/11/2022		21/11/2022	
सुरक्षा निधी देयक			
अन्य देयक			
शुद्ध देयक (नियत तिथि तक)		101940.00	
सकल देयक (अधिभार सहित)		103470.00	
भुगतान की रसीद की मोहर			

## Figure – Contract Defined

As it can be observed that the contract demand load of the building is 10 kW

### Connected Load

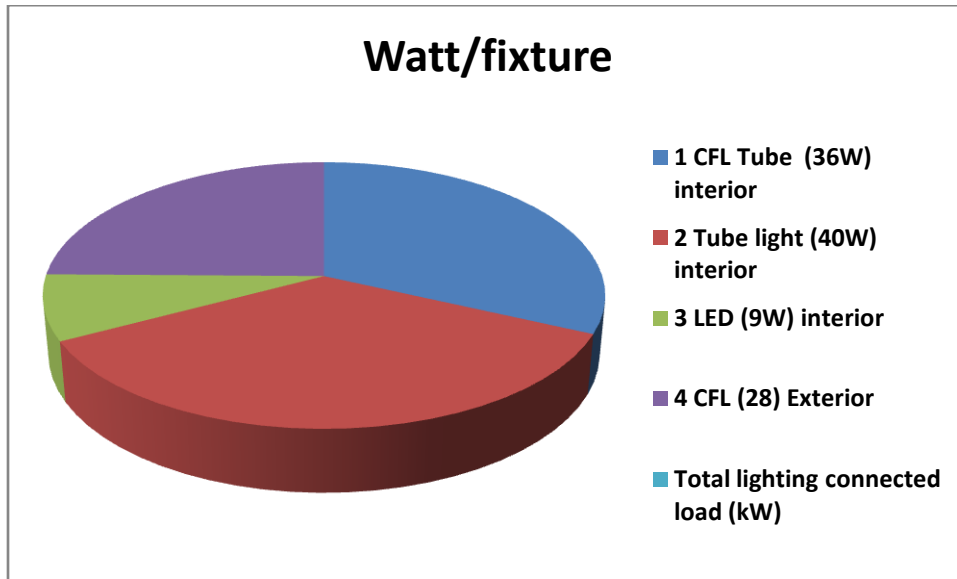
It is defined as the sum of ratings of all electrical that are connected at the supply point regardless of their status of operation. It depends on the installed

Atal Government College, Pandatarai has different types of load in the building. Office building loads are majorly divided in different category:

1. **Lightning load**
2. **Cooling load**
3. **Evaporative Coolers & Fans Load**
4. **Equipment's Load (computer Printer, Photo Copy Machine, Water purifier, etc.)**

<b>Total Connected Load Breakup</b>			
<b>S. No.</b>	<b>Systems/Area</b>	<b>Load in (kW)</b>	<b>Load in Percentage (%)</b>
<b>1</b>	<b>Lightning</b>	<b>4.1</b>	<b>18%</b>
<b>2</b>	<b>Fans and cooler</b>	<b>8.3</b>	<b>38%</b>
<b>3</b>	<b>Computer/Printer</b>	<b>1.8</b>	<b>8%</b>
<b>4</b>	<b>Inviter</b>	<b>7.9</b>	<b>36%</b>
<b>Total Connected Load Breakup</b>		<b>22.09 kW</b>	

**Table: Breakup of Connected Load Summary**



**Pie-Chart Showing Break-up of Connected Load**

Contract demand according to unity Bills (kW)	Calculated Connected load (kW)
<b>22</b>	<b>22.09</b>

# **Lighting and Controls**

## Lighting and Controls

The facility is college building. This building includes office area, Class room and Lab space Lighting Load is contributing near about 18% of total connected load. The facility has following type of fixtures installed in the buildings:

### Lighting fixture load segregation

S. No.	fixture description	serving area	Quantity	Watt/fixture	Total Wattage
1	Tube light (40W)	interior	124	40	4960
2	LED (9W)	interior	24	9	216
Total lighting connected load (kW)					5.176

Table - Lighting Summary



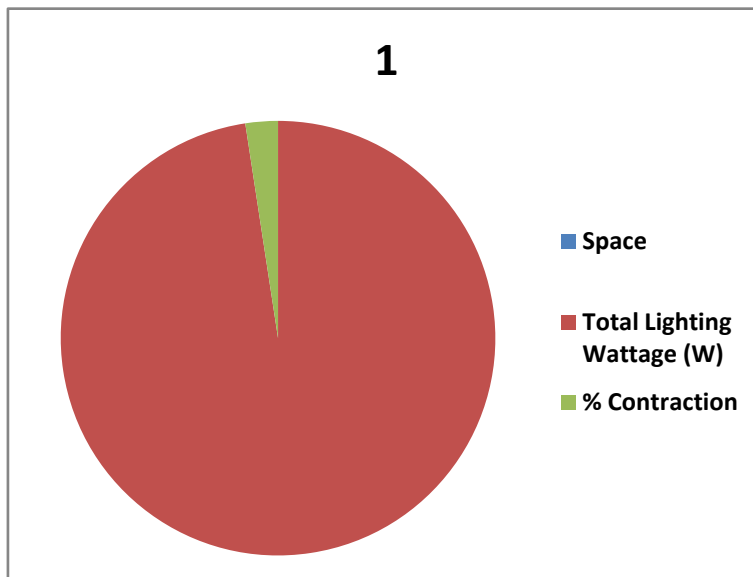
**Figure - Fluorescent tubes installed in facility**



**Figure - LED lights installed in facility**

**Government College, Pandatarai**

S. No.	Space	Total Lighting Wattage (W)	% Contraction
1	Building Interior	3884	96
2	Building Exterior	168	4
<b>Total Lighting Wattage (kW)</b>		<b>4.1</b>	





## ➤ **Building Envelope**

# Atal Bihari Vajpayee Government College Pandatarai



## Window Area



as well as relating it to the natural environment in terms of access to daylight, ventilation and views. The window-to-wall ratio is measure of the percentage area determined by dividing the buildings total glazed/window area by its exterior envelope wall area but as per elevation of facility it has been found that all windows fitted in building envelope is made up



Figure - Show wall of Facility

## Roof Area

The building roof construction is made of 5 inc. concrete Slab. A roof is part of building envelop. All roofs are not covered by solar photovoltaic, or any renewable energy system, or utilities and services that render it unsuitable for the purpose and shall be either cool roofs or vegetated roof.



**Figure - Roof of facility**

Coolers, Ceiling & Exhaust Fan's

## Evaporative Coolers, Ceiling & Exhaust Fan's

A ceiling fan is a mechanical fan, usually electrically powered, suspended from the Government College, Pandatarai building there are total 114 numbers of ceiling mounted fan. Some Evaporative Coolers are also installed in facility for meeting thermal comfort up to its best.



Figure - Ceiling Fans installed in facility

# **Electrical System & Renewable System**

## Uninterrupted Power Supply

Uninterruptible Power Supply (UPS) system is installed in the building vicinity for computer & other equipment for continuous power supply for the systems wherever is it required. UPS is installed in the rooms of Ground floor having a capacity of 5 kW each



**Figure - show battery installed in facility Uninterruptible Power Supply**

## Equipment's Load

There are several equipments like computers, printers, photocopiers, etc. installed in facility. Computer/Printer contribution in total connected load is around 8% and other equipment's contributes around 36% of total connected load

S. No.	Description	Quantity	Wattage	Total Wattage
1	Computer	15	150	2250
2	Printer	3	300	900
3	TV	1	150	150
4	Water purify	2	750	1500
5	Projector	2	100	200
6	Oven	1	1000	1000
Total load equipment's (kW)				6 kW

**Table – Equipment Load Segregation**





Figure - Induction **Oven** installed in facility

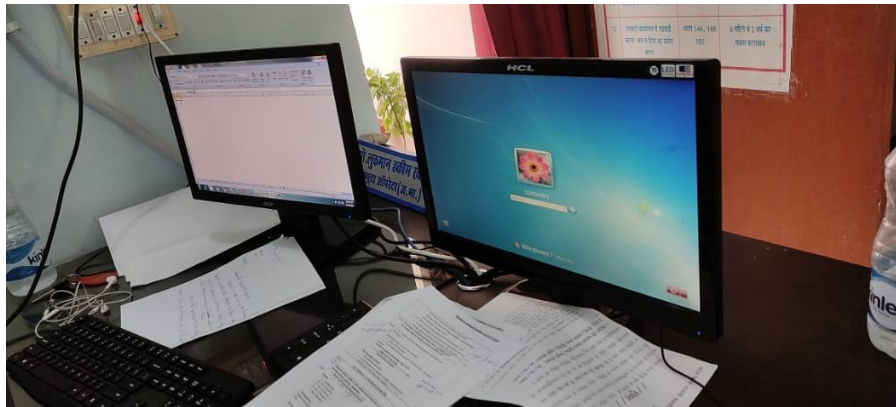
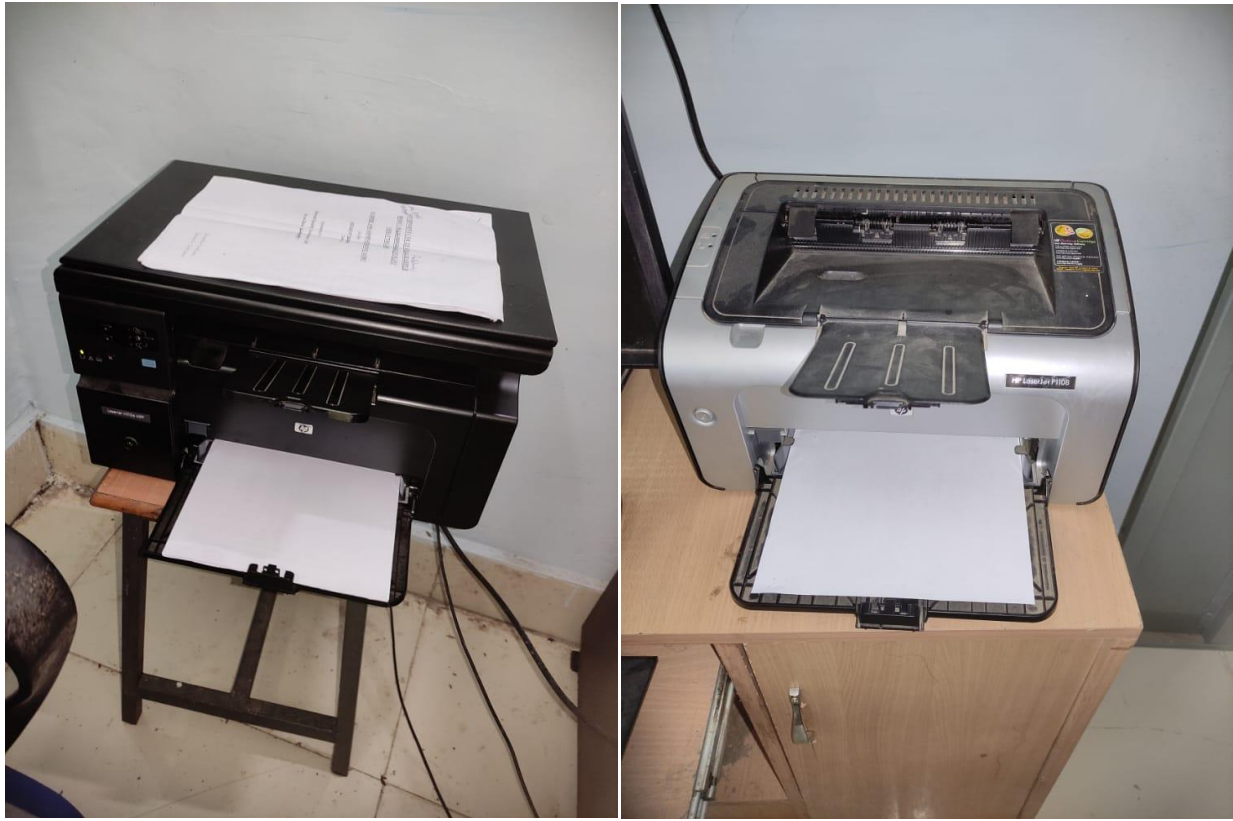


Figure — System- computer's installed in facility

S. No.	Description	Quantity	Wattage	Total Wattage
1	Printer	3	300	900



**Figure — System- Printer computer's installed in facility**

<b>S. No.</b>	<b>Description</b>	<b>Quantity</b>	<b>Wattage</b>	<b>Total Wattage</b>
<b>1</b>	<b>projector</b>	<b>2</b>	<b>100</b>	<b>200</b>

**System Projector  
Installed in facility**



Figure — System Projector computer's installed in facility

## Transformer

Building facility has 1 transformer used for supplying the electricity to the building.  
Rating capacity of the transformer is about 100 kW for power supply.

Atal Bihari Vajpayee Government College, Pandatarai

**Table - transformer Details**



**Figure - Transformer installed in facility**

The temperatures at panels were analyzed by Thermal Imaging Camera. The images below show the snap shot taken by thermal imaging camera



## Figure – Fully Infrared

Temperature Measurement at Panels			
S.No.	Feeder	temperature measurement Point ©	
		Panel Body	Control Wiring
1	Panel -1	25	26.7

**Table - Temperature Measurement**

It has been observed that there is a fluctuation in current distribution between three phases (R-Y-B). Y phase is hotter than other phases as extracting higher amount of current at electric panel.

Suggestion

Phase Balancing Devices are available in market they lead proper balancing of all phases which doesn't cause abnormal distribution of current /load in all phases. They also reduce the chance of fire hazards in panels or facility



All required data is collected by Department of Chemistry. In bulding , in every room, how much fans, tubes, fans,computer , Instrument ,etc will these is measurd. According to survey following data collected.

USE OF LED BULBS/ POWER EFFICIENT EQUIPMENT

Deapartment instrument.	Fan	LED	Tubeling	Frige-	computer	printer	Xerox machine	Scanner	Projector
Principal Office.	3	2	3	1	1	0	1	0	0
Zoology Lab.	4	4	4	0	0	0	0	0	0
Chemistry Lab.	6	4	4	1	0	0	0	0	0
Botany Lab.	4	4	4	0	0	0	0	0	0
Computer lab.	6	6	5	0	10	0	0	0	0
Office.	4	2	4	0	4	2	0	1	0
Staff Room	2	0	4	0	0	0	0	0	0
Library	5	2	3	0	1	0	0	0	0
Sport	2	0	3	0	0	0	0	0	0
H.O.D. office	2	1	4	0	0	0	1	0	0
Smart class room	12	0	7	0	1	0	0	0	1
Class room	64	0	52	0	0	0	0	0	0
Total Qunantity	114	24	97	2	17	2	2	1	1
Total watt.	1579								



**Principal**  
**Atal Bihari Vajpayee**  
 Govt. College, Pandatarai  
 Distt. Kabilrdham (C.G.)