



## Sensor Based Energy conservation

### Introduction

1. Using sensors we can certainly minimize the consumption of electrical power. Power crisis is one of the most common problems in India. With the help of the sensors we can eliminate this shortage by minimizing the wastage of electrical power or saving our generated power. PIR is the type of sensor that gives us signal when anything crosses its rays. It is an electronicsensor that measures infrared (IR) light radiating from objects in its field of view. It is a low- cost device used to detect a change in motion in its surroundings within different range of radius. In many offices there are pavements where lights kept switched on for the whole night and day. But if we use the sensor then only when it gets motion it will give signal and the lights will be switched on. So, this project is very lower costing and also power saving. It also minimizes the electric bills of any office. Moreover, it creates an opportunity for minimizing the load shedding in the cities and villages.

**Based on this principle a motion sensor LED bulb is being used in the campus and in various rooms, corridors and offices of the college.**

2. Similarly another LDR sensor that gets activated by light is also being used to minimize electrical wastage.

The sensor is placed over the lights and when the day ends the sensor gets activated in the absence of light and the LED bulb is switched on automatically.

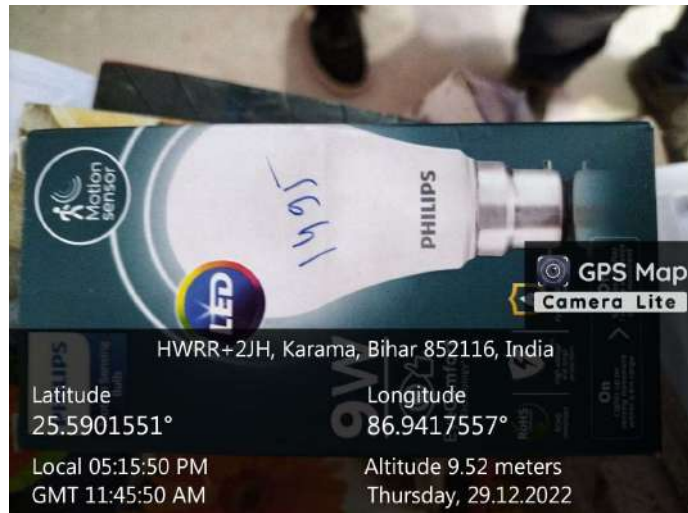
When the sun comes back up and the daylight falls on the sensor it gets activated and the LEG bulbs connected to it is automatically switched off.

This helps us reduce the electricity consumption and accidental powered on lights in and around campus are now minimized.

### Plan of Action

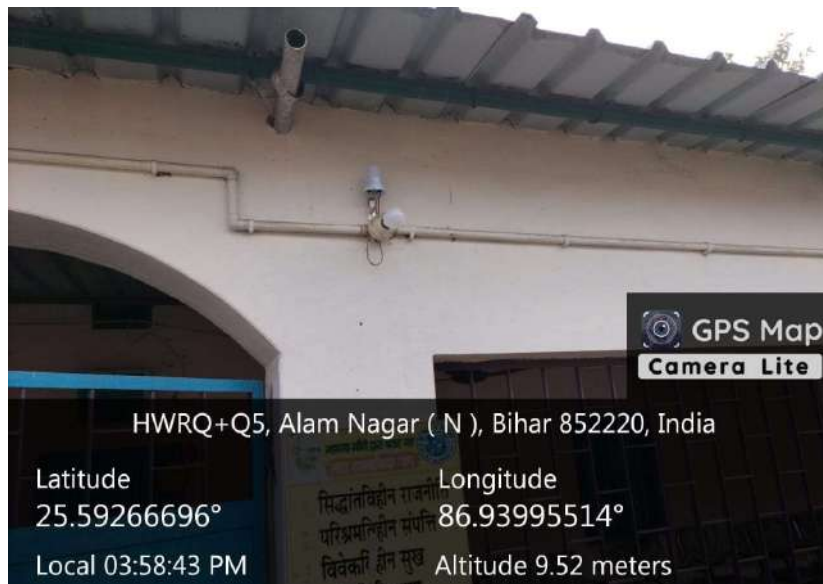
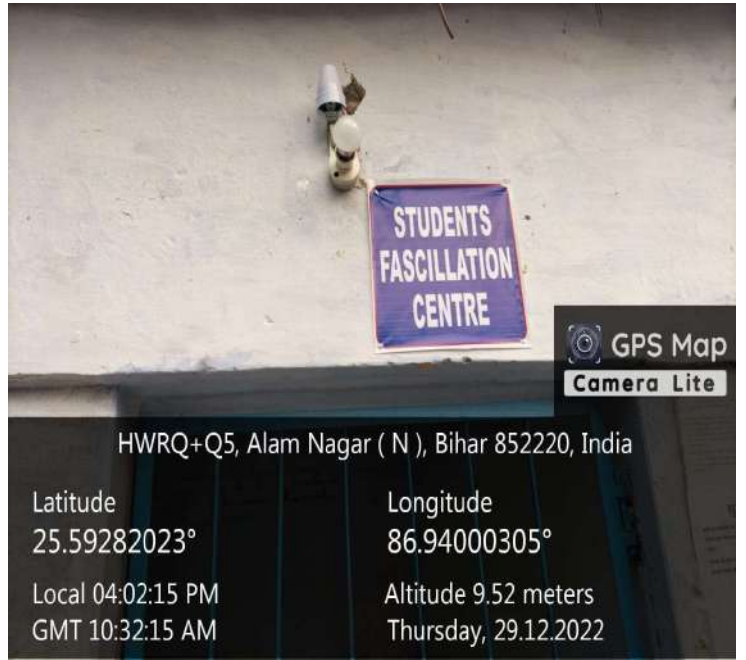
**Phase 1 - Mapping of Spots for placing sensors in Campus – Complete.**





### Motion Sensing LED lights





**LDR Light Sensor Switch**



## Use of Light Emitting Diode (LED)

---

### Introduction

Power crisis is one of the most common problems in India. With the help of LED we can eliminate this shortage by minimizing the wastage of electrical power or saving our generated power. Light-emitting diode (LED) is one of today's most energy-efficient and rapidly-developing lighting technologies. Quality LED light bulbs last longer, are more durable, and offer comparable or better light quality than other types of lighting.

### Energy Savings with use of LED

LED is a highly energy efficient lighting technology, and has the potential to fundamentally change the future of lighting in the United States. Residential LEDs -- especially ENERGY STAR rated products -- use at least 75% less energy, and last 25 times longer, than incandescent lighting. Widespread use of LED lighting has the greatest potential impact on energy savings

### How LEDs are Different

LED lighting is very different from other lighting sources such as incandescent bulbs and CFLs. Key differences include the following:

- Light Source: LEDs are the size of a fleck of pepper, and a mix of red, green, and blue LEDs is typically used to make white light.
- Direction: LEDs emit light in a specific direction, reducing the need for reflectors and diffusers that can trap light. This feature makes LEDs more efficient for many uses such as recessed downlights and task lighting. With other types of lighting, the light must be reflected to the desired direction and more than half of the light may never leave the fixture.
- Heat: LEDs emit very little heat. In comparison, incandescent bulbs release 90% of their energy as heat and CFLs release about 80% of their energy as heat.

So, this project is very lower costing and also power saving. It also minimizes the electric bills of any office. Moreover, it creates an opportunity for minimizing the load shedding in the cities and villages.



**Different type of LED lights**



**Comparison between LED vs CFL vs. Incandescent Bulb Table 1:  
Comparison between LED vs CFL vs. Incandescent Bulb**

Light Output	LED	Incandescent Bulb	CFL
Lumens	Watts	Watts	Watts
450	4-5	40	9-13
800	6-8	60	13-15
1100	9-13	75	18-25
1600	16-20	100	23-30
2600	25-28	150	30-55

### **Energy saving by replacing CFL with LED**

Dominant light source at most places in the campus is traditional 23W CFLs As per our data collection, the campus has in total 372 CFLs. If these CFLs are replaced by LEDs 10-12W power can be saved per CFL.

#### **Cost Analysis of Replacing CFLs with LEDs**

- Total No. of CFLs in Campus = 372
- Average Power of CFL = 23W
- Average Power of LED = 12W
- Power saved per LED = (23-12)W = 11W
- Total Power saving = 372\*11W = 4092W = 4.092Kw
- Average Use of CFL per year = 270\*7h=1890h
- Total Energy saved per year = 4.092\*1890 kWh = 7733.88kWh
- Saving in Rs. Per year = 7733.88\*4 = Rs. 30935.52
- Average Cost of Replacing each CFL = Rs. 110
- Total Cost of Replacing all CFLs = 372\*110 = Rs. 40920
- Capital Cost Recovery time = (40920/30935.52) = 1.387 yr

#### **Plan of action**

**Phase 1** - Mapping of Spots of in Campus – Complete.

**Phase 2** : Ordering LED's for replacement

**Phase 3**:Replacement of LED's as per requirement( as soon as any CFL needs replacement it is being replaced by LED

**Phase 4**:Campus wide installation – in process





**LED in college campus**

A handwritten signature in blue ink, appearing to be 'M.K.S.', written over a diagonal line.

**Principal/ Chairman  
U.V.K. College, Karama  
Alamnagar (Madhepura)**

**7.1.3 Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste**

**Solid Waste Management:**

For the collection of waste, floor wise separate bins are kept. For the recycle/reuse of used paper collected and used both sides for office purpose and official drafts. Garbage is segregated into wet and dry bins. Canteen and Hostels wet garbage is disposed of in the composting plant prepared specially for this purpose in the institute.

UVK College has participated in the govt organized Swach Bharat Mission. Under this banner the utility of recycling the solid and biomedical waste has been elaborated. People from different aspects of life delivered their talks about the proper usage of waste. Moreover, the NSS volunteers have also demonstrated the proper procedure of disposing the waste.



**Compost Pit**



### **E- Waste management:**

The College has taken steps for proper disposal of all kinds of electronic waste, such as batteries, cells, obsolete electronic devices, computers, monitors and printers, UPS etc. e-waste management and disposal committee members take initiatives to manage the waste in the campus. The major sources of e-wastes at our college are outdated computer monitors, printer cartridges, mouse, keyboards, etc.. These are periodically disposed back to the suppliers through buy back schemes. Refilling of the printer cartridges is done outside the college campus.

Since the campus is in rural area there is less access to vendors for e-waste disposal.

Therefore we keep the e-waste till there is new procurement and when the vendor comes for replacement of new products we hand it over to them as e-wastes.

Due to IT practices being implemented in large scale, the quantity of e-waste is increasing. From the next session we will have a registered vendor for e-waste who will responsibly take care of e-waste for our institution.





**Maintenance of Water bodies and Distribution system in the campus:**

The water bodies are maintained regularly so as to provide sustainable, consistent, economic safe and adequate water to the campus. The main objective of the maintenance is to provide diseases free environment. Mainly it is carried out to prevent the spread of water borne diseases like cholera, dysentery and typhoid etc.

By using Low flow plumbing fixtures, the wastage of water is highly reduced. All the contractors of the college are educated and motivated about the importance and the usage of water in the campus. Scheduled Inspection of machineries is done in daily, weekly, monthly and annual basis in the campus. In order to avoid leakages and to prevent wastage of water, overall distribution system in the campus is well maintained and supervised by Maintenance Department of the college.



  
**Principal/ Chairman**  
**U.V.K. College, Karama**  
**Alamnagar (Madhepura)**

#### 7.1.4 Water conservation facilities available in the Institution:

1. Rain water harvesting
2. Bore well /Open well recharge
3. Construction of tanks and bunds
4. Waste water recycling
5. Maintenance of water bodies and distribution system in the campus

UVK college is located in rural area, there is no Municipal Water supply for the college. The college depends on ground water for all its water needs. Hence, efficient usage of available water and adaptation of water conservation measures are essential.

The daily requirement of water in the campus is around 30000 liters.

#### Conventional Rainwater Harvesting Pit

- Conventional rainwater harvesting pits measuring 02 feet x 02 feet in size have been established around the campus to collect the rooftop runoff.
- Rainwater is collected from a roof-like surface and redirected to a pit so that it seeps down and restores the groundwater.



**Bore well /Open well recharge:**

Bore wells have been placed on 3 locations that go 20 feet deep in the soil. The water level in this area is very good and so the water source can easily be tapped through 20feet deep bores.

The rainwater is then circulated through these bores and it helps is maintaining water level in the area.

**Construction of Contour Trench:**

A contour line of is also created along one boundary of the college for the percolation of rain water.

**Use of trees that use less water:**

The campus is green campus with a lot of plantation and greenery. The careful selection of trees makes a whole lot of difference while creating a green campus. Trees that use up less water have been handpicked and have been planted.



**Maintenance of water Bodies Distribution System in the Campus:**

The college campus has open areas which have not been plastered or cemented. The natural ground is open and the rainwater gets seeped into it naturally. Hence the water level gets normalized in every monsoon season.

The proposed concrete area too will have perforation and holes to absorb the rainwater directly to the ground.

All rooftop pipes have outlets on the ground for the same reason.





A handwritten signature in green ink, appearing to be 'S.M.S.', written over a horizontal line.

**Principal/ Chairman**  
**U.V.K. College, Karama**  
**Alamnagar (Madhepura)**

### 7.1.7 POLICY FOR PERSONS WITH DISABILITIES

Right of Persons with Disabilities Act, 2016 prohibits discrimination against individuals with physical and mental disabilities. UVK College is against all kinds of discrimination on any grounds including disability. We intend to advance a comprehensive and inclusive teaching and learning environment in which incapacitated students and employees are not distraught or treated unfavourably.

The college aims to design its programs, administrations, and activities accessible to the students. All the authorities of the institute are striving in order to extending a helping hand towards the differently abled so as to make sure about the Benefits of grounds programs, administrations, and activities. These guidelines apply to all the Institute Faculty and staff.

#### 1. Built environment with ramps/lifts for easy access to classrooms.



#### 2. Provision for enquiry and information : Human assistance, reader, scribe, soft copies of reading material, screen

The college has few disabled students and a professor in the science department who comes under disabled quota.

When the students or the faculty demand the college provides scribes and other facilities to them. We have been successful in sensitizing the college and its stakeholders to be more giving and emphatic towards the disabled.

**Principal/ Chairman**  
**U.V.K. College, Karama**  
**Alamnagar (Madhepura)**

### 7.1.5: Green Campus Action Plan

7.1.5	The College has Green Campus initiative and action plan for it.	
S.No.	GREEN CAMPUS INITIATIVES	ACTION PLAN IMPLEMENTED
1.	<b>RESTRICTED ENTRY OF AUTOMOBILES</b>	The college encourages the staff and students to use the vehicles with pollution check stickers to reduce environmental pollution. Parking is made outside the college.
2.	<b>USE OF BICYCLES</b>	The students in the campus as well as in the hostels are using bicycles to use as a mode of transport. It is environment friendly and prevents pollution.
3.	<b>PEDESTRIAN FRIENDLY PATHWAYS</b>	The college has specially constructed & maintained pathways for the benefit of students and faculty. The pathways are built keeping the green campus image in mind and is pedestrian friendly.
4.	<b>BAN ON USE OF PLASTIC</b>	Ban on plastic is strictly followed in the campus. Single-use plastic items such as plastic bottles, bags, spoons, straws and cups are banned completely and awareness is created among staff and students through orientation and display boards in the premises.
5.	<b>LANDSCAPING WITH TREES AND PLANTS</b>	UVK College has a beautiful landscape with mix of very old trees, middle aged trees, young trees or saplings and herbs and shrubs. The college gardens are well maintained through skilled and experienced persons.



## **INSTITUTIONAL INITIATIVES:**

### **USE OF BICYCLES**

The students nearby use bicycle to go from hostel to college and vice versa. Students and staff coming from nearby villages also prefer bicycle as a mode of transport for attending the college. It is environment friendly and prevents pollution.

### **RESTRICTED ENTRY OF AUTOMOBILES**

The college encourages the staff and students to use the vehicles with pollution check stickersto reduce environmental pollution. Vendors are restricted to enter inside the college campus using automobiles and are asked to park their vehicles in the entrance.

The student parking is also situated outside the campus building.

### **BAN ON USE OF PLASTIC**

The College celebrates World Environment Day on 5th June. Single-use plastic items such as plastic bottles, bags, spoons, straws and cups are banned completely and awareness is created among staff and students through orientation and display boards in the premises. To restrict the use of plastic, measures have been taken to replace plastic tea cups and glasses with plastic free glasses in the canteen. The staff and students are informed to use steel or copper water bottles instead of plastic bottles. Students and faculty take oath not to use paper covers or bags. Under Swachchh Bharat Abhiyan, students with NSS volunteers pledge to keep the campus free from polythene.

### **LANDSCAPING WITH TREES AND PLANTS**

organizes tree plantation program every year at the College Campus. Faculty and students take part in the Plantation programme. Students and staff enthusiastically initiate and participate in the tree plantation drives on the campus and also outside the campus.









**75 Azadi Ka Amrit Mahotsav**

## UVK COLLEGE , KARAMA ALAMNAGAR

### Awareness Programme on "SOLID WASTE MANAGEMENT"

(Elimintation of Single Use Plastic)

**Single Use Plastic Banned from 01<sup>st</sup> July - 2022**




**Principal/ Chairma**  
U.V.K. College, Karam  
Alamnagar (Madhepur

## IN COLLEGE CAMPUS

