

# **INSTITUTE OF HOME ECONOMICS**

**(UNIVERSITY OF DELHI)**



## **Supporting Documents for Criterion 7.1.2**

**Facilities for alternate sources of energy and energy conservation measures**



**INSTITUTE OF HOME ECONOMICS**  
(University of Delhi)  
**इंस्टिट्यूट ऑफ होम इकोनॉमिक्स**  
(दिल्ली विश्वविद्यालय)



**NAAC GRADE 'A' ACCREDITED**

Ref. No. ....

**Supporting Documents for Criterion 7.1.2**

**Facilities for Alternate Sources of Energy and Energy Conservation Measures**

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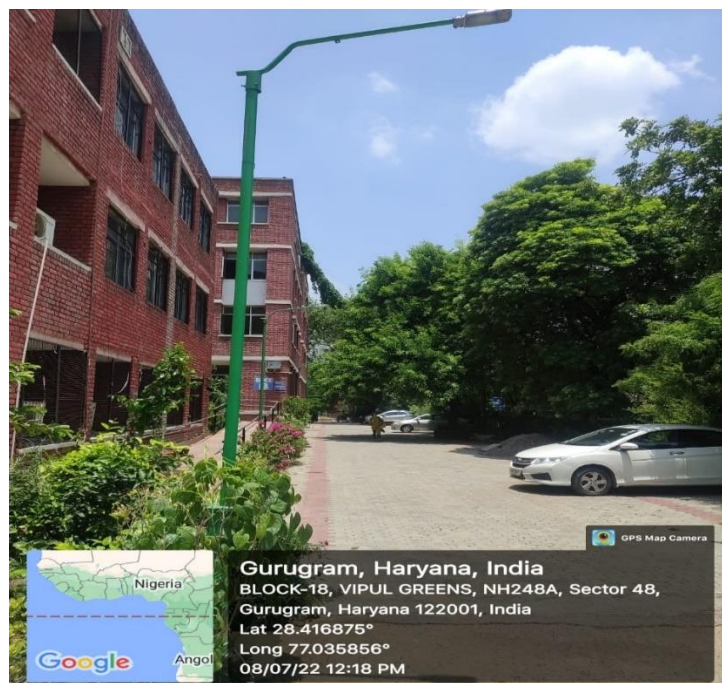
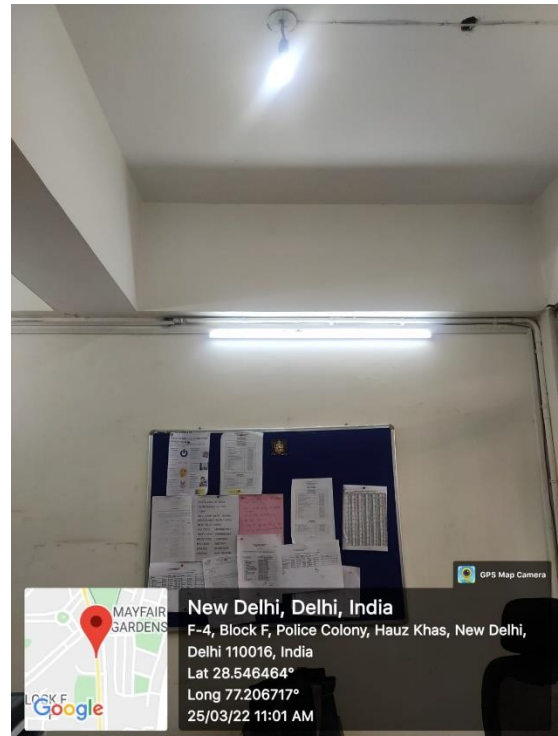
*Geeta J. Kumar*

## Solar energy and LEDs

### Solar Lights



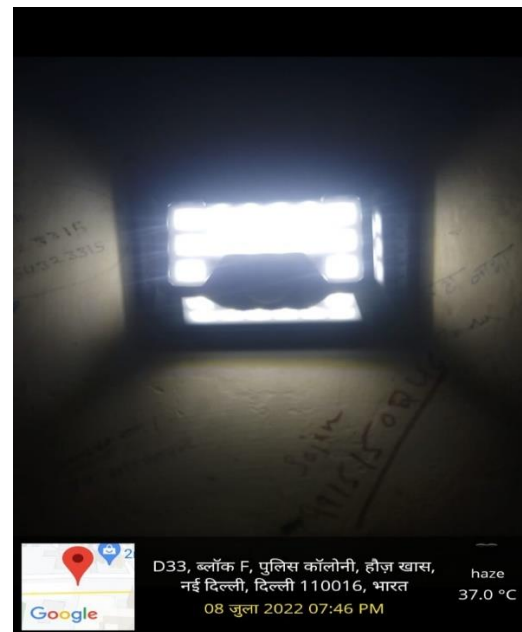
### LEDs







## Sensor Based lights



UNIVERSITY OF HOME ECONOMICS  
UNIVERSITY OF DELHI  
Geeta J. Kumar

# **ENERGY MANAGEMENT PRACTICES**

## **INSTITUTE OF HOME ECONOMICS**

**(June 2020 – July 2021)**

The Energy management report consists of two sections. The first section analyzes the college electricity bills over a tenure of a year (pre and post study) and reflect upon impact of installing solar lights and energy consumption. The second section of the report deliberates upon energy management and behavioral shifts related to commuting patterns of the college staff and students. Both the sections reflect on fuel pattern consumption and shifts geared towards energy conservation and sustainability.

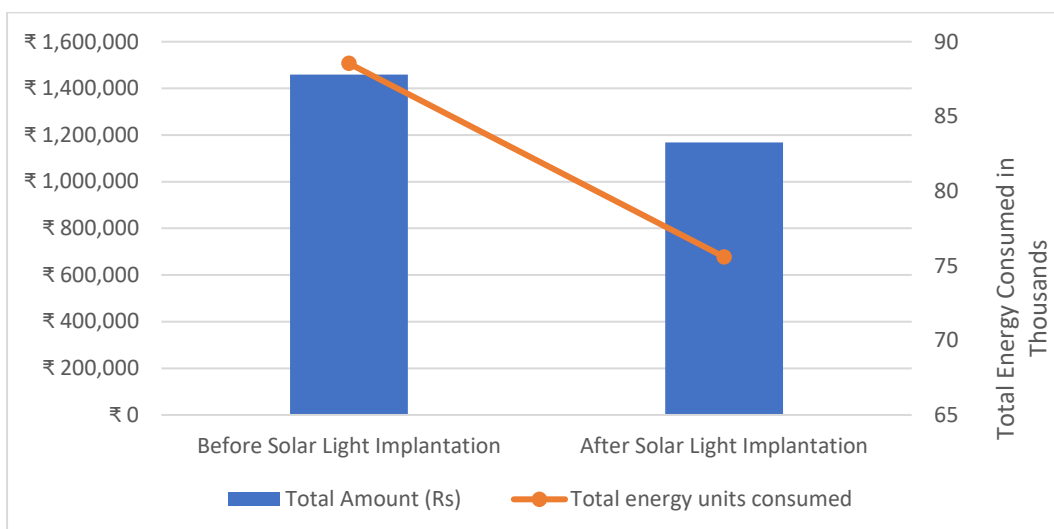
### **Section 1: Energy conservation: Installing Solar Lights**

#### **Introduction**

The combustion of fossil fuels for energy results in a significant amount of greenhouse gas. These emissions are the ones that contribute to global warming. Most sources of renewable energy result in little to no emission and is also increasingly cheaper than fossil fuels. Also these can also provide millions of greener jobs. Institute of Home Economics is devoted to this green cause and has opted for many eco-friendly initiatives. One of the initiatives undertaken by the institute was installation of more than 20 solar street pole lights around the college's buildings in the month of January 2021.

To understand the economic feasibility about this initiative along with being eco-friendly, a comparison on the electricity bills before and after the installation of solar lights was undertaken to calculate the amount of money saved, which could be used for more such initiatives.

Figure 1. Improvement in Energy Consumption



## Results

On comparison the BSES electricity bills for 6 months prior to the installation and 6 months after the installation of solar electric poles, it was found that the institute had saved Rs. 2,90,800/- in six months which is approximately 25% saving.

## Section 2: Energy Consumption: A Survey Report

### Introduction

Energy consumption and economic growth are closely interlinked. India's energy policy focus on increasing energy generation and to reduce energy poverty. In contemporary times the drift has been on developing alternative sources of energy and working towards self-sustainability. In 2017, India attained 63% energy self-sufficiency. The good practice and endeavors of energy generation and reducing energy poverty may further be instilled in behaviour and functioning through HEI. To navigate and understand the consumption, attitudes and readiness for energy saving opportunities, a survey was conducted in the college. The survey elicited 550 responses. The participants were students, faculty and non-teaching staff.

The survey aimed to understand the existing fuel consumption patterns among staff and students. It also was an attempt to increase the awareness regarding the usage of green fuel.

### Method

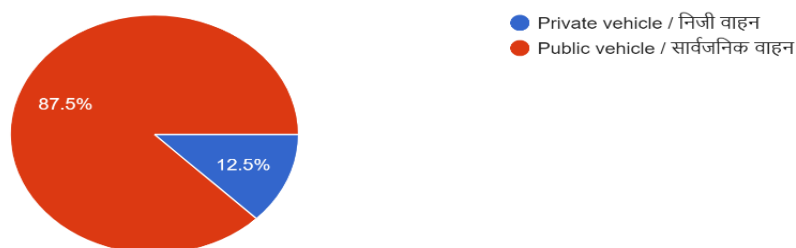
The questionnaire used as the survey instrument consisted of 13 questions items translated both in English and Hindi including questions on background information as well as fuel

consumption pattern. A sample of the questionnaire was generated and shared using the link <https://forms.gle/L66EstWcEq7PGhrd6>. Further the questionnaire was circulated among teaching and non-teaching staff as well as students through the WhatsApp groups. Responses were generated on excel format, frequency tabulation and percentages were auto generated using excel software. Students and faculty both were involved in constructing tools, result analysis and discussion.

## Results and Discussions

The survey generated a total of 550 responses. It was found that out of total 82.7% (n = 454) were from students, 10.9% (n = 60) were teachers and 6.4% (n = 35) were non-teaching staff. A gender distribution represented 529 (96.2%) were women and 21 (3.8%) men respondents. Further, the age wise pattern in the survey participation highlighted majority respondents to be in age of 18-25 years, 2.9 % were between 25-35 years, 8.2 % were in 35-50 years and 6 % were above 50 years.

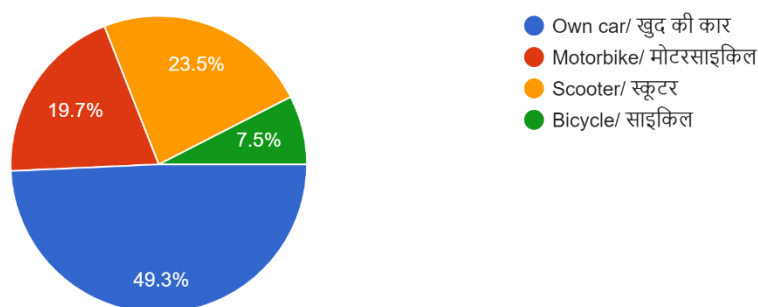
Figure 2. Mode of Transport Used



Majority of respondents i.e. 87.5% (n=477) utilized public transport for commuting to college in comparison to 12.5% (n= 68) who used private vehicles. Recommendations of working group on Urban Transport (2006) and Ministry of New and Renewable Energy, Government of India have deliberated the changing landscape of cities in favour of planning, practices and support.

Further the use public transport highlighted commuting by metro (80.3%) followed by bus (13.1%), autorickshaw (3.4%), cab (1.7%), train (0.9%).

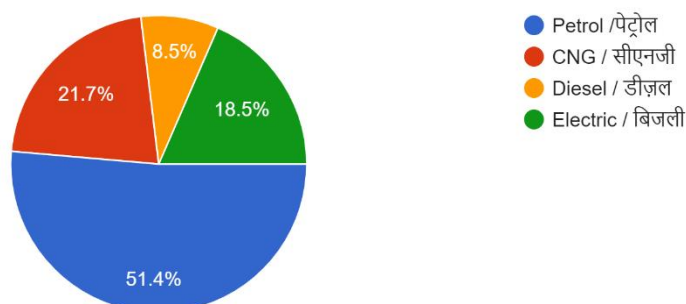
Figure 3. Fuel patterns of Private Vehicle Commuters



A total of 213 respondents preferred and used private vehicles like cars ( 49.3%; n= 105), two wheelers ( 23.5%; n=50) and motorbikes ( 19.7%; n= 42) and bicycles ( 7.5%; n=16). The college environment committee has taken a note of it and would work towards channelizing renewable fuel sources further.

Another finding elaborated on preference towards carpooling. Only 30% (138) respondents reported to use carpooling. This may require further attention.

Figure 4. Nature of Fuel Consumption at IHE

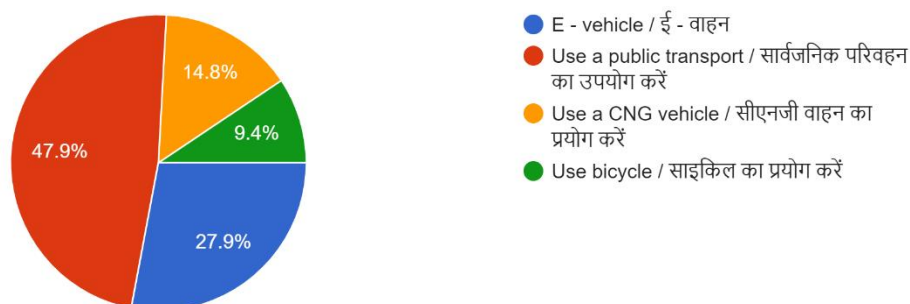


The college data revealed that almost half of the respondents were conscious fuel consumers working towards renewable and green energy alternatives as the fuel sources. Almost 40.2% staff and students in the college used CNG and electric energy as their vehicle fuel source. Respondents fuel source reported as CNG was 21.7% while electric fuel source was reported by 18.5%. The least preferred fuel was diesel which was reported to be used by 8.5% of respondents.

Almost all respondents (96.1%) of the college favoured green and sustainable energy to be used as an alternative energy source.

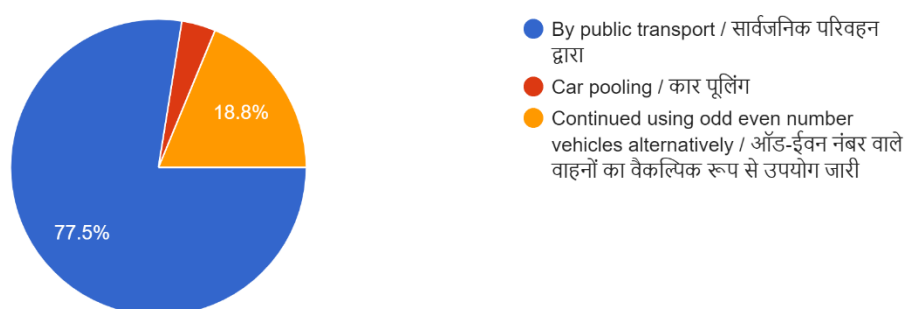
Figure 5. Preferred Commuting Pattern





Most respondents opted for utilizing public transport (47.9%; n=240) as their preferred option. Other opted for switching over to e-vehicles (27.9%, n= 140), use of CNG vehicles (14.8%, n=74) and use of bicycles (9.4%; n=47).

Figure 6. Tackling the AQI crisis in Delhi



The college responded to Delhi's very poor Air Quality Index (AQI), by mostly switching over to public mode of transport (75 %). More than 75% (n= 397) while some (18.8%) continued to use odd and even number vehicles alternatively and only 3.7% reported to initiate carpooling.

## Conclusions

- IHE is an energy and fuel conscious college. Most prefer and use public transport to commute to the college.
- The switch over to green energy fuel-based vehicles was a preferred choice for most private vehicle commuters in the college.
- Better community-based programmes and vehicle link apps may facilitate carpooling in the college.

- The college is geared towards renewable energy plan and switch over and is actively working to be fully energy efficient.

**Submitted by:**

**Environment and Community Outreach Committee**



Geeta J. Kumar


FACULTY OF HOME ECONOMICS  
UNIVERSITY OF DELHI

## Contract for Permission to use Solar Lights


**INDIA NON JUDICIAL**

**Government of National Capital Territory of Delhi**

**e-Stamp**

  
सत्यमेव जयते

Certificate No.	: IN-DL20448801847798S
Certificate Issued Date	: 22-Dec-2020 10:13 AM
Account Reference	: IMPACC (IV)/ dl1005503/ DELHI/ DL-DLH
Unique Doc. Reference	: SUBIN-DL20448801847798S
Purchased by	: INNOVATIVE POWER SOLUTIONS
Description of Document	: Article 5 General Agreement
Property Description	: Not Applicable
Consideration Price (Rs.)	: 0 (Zero)
First Party	: INNOVATIVE POWER SOLUTIONS
Second Party	: THE INSTITUTE OF HOME ECONOMICS
Stamp Duty Paid By	: INNOVATIVE POWER SOLUTIONS
Stamp Duty Amount(Rs.)	: 50 (Fifty only)



.....Please write or type below this line.....

*Atul Kaur*  
Partner

*Dr. Geeta Kumari*  
22/12/2020  
Dr. Geeta Kumari  
Institute of Home Economics  
New Delhi-110016

Important Alert:  
The authenticity of this Stamp certificate should be verified at 'www.stampsamp.com' or using e-Stamp Mobile App of Stock Holding  
Company in the details on this Certificate and as available on the website / Mobile App renders it invalid.  
In case of discrepancy, please inform the Competent Authority.

## AGREEMENT

This agreement is made on this day 22/12/2020 at Delhi between **M/S. Innovative Power Solutions** represented by **Mr. Atul Kaushal**, with its registered office at A2/54, Safderjung Enclave, New Delhi- 110029  
(Herein after called First Party).

AND

**The Institute of home economics**, represented by **Dr. Geeta Trilok Kumar (Principal)** With its office at F-4, Hauz khas enclave, New Delhi. 110016  
(Herein after called Second Party)

The term "First and Second Party" shall admit and include all its successors in interest etc.,

Whereas the First Party is engaged in the business of installing Solar Lights and is well experienced in its installation, and maintenance.

Whereas the Second Party declares that he/she is the sole owner/ lessee/ licensees/ mortgage/ charge holder of the below stated property for the period of this agreement being entered.

### Property/ Premises description:

Approximate total area of premises. \_\_\_\_\_ acre.

Description of system installed by first party :- **Hybrid solar light system with 20 pole**  
Whereas, after negotiations, the Parties herein are entering into this agreement in writing, on the following terms and conditions will be **executed w.e.f from 25/01/2021**.

### TERMS AND CONDITIONS:

1. The First Party shall Install, commission in total **20** solar street light pole system and maintain them 1.(along with posts for 2-sided display boards, back lit/non back lit, both side having minimum size of 42"x 32") or 2. (LED/LCD display systems ) or both option with number of poles in first option & number of poles in second option at mutually agreed location having optimum displayed material visibility and technical feasibility. The First Party is endowed with the above mentioned rights in lieu of providing solar lights service free of charge for entire period of the agreement.
2. Initially this agreement is valid for **10 years** excluding the period in which there are no physical classes are being conducted in college because of the **Covid 19** However, by mutual consent it can be extended for the further period.
3. The ownership rights of solar unit and related material shall solely always vest with the First Party.

For Innovative Power Solutions

Atul Kaushal

Partner

Dr. Geeta Trilok Kumar

Institute of Home Economics

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4. The rights mentioned above pertaining to Material to be Displayed of various products, services, utilities to promote its clientele/sponsor, which are socially accepted and duly permitted by law to be displayed.
5. The Second Party shall also ensure the security and the safety of the solar lights and attendant accessories against theft or pilferage. In case of theft or damage, the Second Party shall help forthwith to report the matter to the area police station and the First Party.
6. The Second Party will permit the First party's clients, sponsors, funding agencies, bankers to inspect the solar lights installed in the premises and to take the pictures of Lamp Post & displayed material, at all reasonable times.
7. In case of malfunctioning of solar lights units, authorized representative of the Second Party will intimate for repair to the First Party, who shall forthwith get them repaired.
8. The First Party or any of its authorized official team-men, its franchises, technicians etc. shall at all reasonable times, be allowed by the Second Party for the maintenance, revising Material Displayed on the installed units.
9. The Second Party also agrees to allow the First Party to re-install the posts, display boards at places acceptable to both the Parties, during the tenure of the agreement.
10. If the First Party apprehends that solar lights Post and the other solar system material are mishandled or are prone to theft or likelihood of damage or of non-visibility re-continuing the assets in the premises, then the First Party is at liberty to revoke this agreement and can take back the solar lights system along with post, LCD monitor & other material and the Second Party will indemnify the First Party.
11. The Material Displayed rights of the First Party on the installed posts are absolute and unconditional.
12. The First Party has the absolute right to take back the complete solar system along with Lamps Post, LCD monitor and other material at the site of Second Party. The Second Party will not make any objection or hurdle at all.
13. Both the parties have a right to withdraw and terminate this Agreement by giving 6 months written notice to the other party. In this case, Second Party is under an obligation to return above stated assets/material as is, where condition to the First Party is.
14. **Sale of complete system:** In the event the the first party intends to sell or transfer the possession of the Demised System, then the first party shall provide to the second party with a prior written notice of at least 2 (two) months of such intended sale and will

For Innovative Power Solutions

*Abul Kalam*

Partner

Dr. G. S. Kumar  
Inspected  
By  
Date

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ensure that this agreement to the Demised system is accepted and agreed to be continued by the new owner and keep the second party indemnified in this regard. A letter shall be issued by the prospective new owner in favour of the second party confirming that the terms herein agreed to shall be binding on the new owner and that the new owner assumes all rights and liabilities of the first party as if this second party had originally been executed with such new owner and the first party.

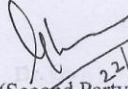
15. In case of any dispute, the point for determination of jurisdiction shall be at New Delhi, India.

IN WITNESS HEREOF THE PARTIES HEREIN HAVE SIGNED THEIR NAMES ON THE DAY, MONTH, AND YEAR FIRST ABOVE MENTIONED.

Witness 1.

For Innovall  
Abul Kadir  
(First Party)

2.

  
22/12/2020  
(Second Party)