





**S.D Mahila Mahavidyalya,Narwana**  
**7.1.3 (b) Energy Audit**

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## S D MAHILA MAHAVIDYALYA

NARWANA-126116 ( JIND ) HARYANA


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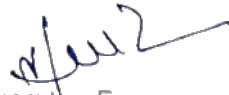
### EXECUTIVE SUMMARY

This is the summary report of energy resources, consumption & energy management for the S. D Mahila Mahavidyalaya, Narwana, Jind

The study encompassed the examination of the existing pattern of energy use in the college and identification of areas where energy & monetary savings could be achieved by employing suitable techno-economic measures.

This report gives the details of energy resources and consumption along with appropriate supporting data. 5.1.2 Capacity building and skills enhancement initiatives taken by the institution include the following

  
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## 2. About the College

### WHEN GIRLS ARE EDUCATED THEIR COUNTRIES BECOME STRONGER AND MORE PROSPEROUS

Keeping in mind the objective to uplift Rural Women, SD Mahila Mahavidyalaya was established and affiliated by Lala Gauri Shankar.

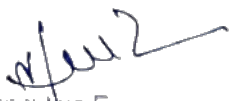
There are near about 1000 students studying in SD Mahila Mahavidyalaya Narwana. Our prime focus is to achieve all round personality development of students through student- centric activities to prepare them for better future and make them responsible citizens of global society, imparting higher education in the field of Arts, Science & Commerce. In spite of being situated in rural area, institution is performing well academically. The students are excelling both in sports and cultural activities too. They have distinguished themselves by winning gold, silver, bronze medals in handball, boxing, kabbadi at university national and international levels We are all proud to be part of this great institution and will strive to make it achieve even greater heights


### Institutional Strength

- Highly qualified and experienced teaching staff
- Blend traditional and modern pedagogical methods
- Automated library, Office, and Well-equipped laboratories
- Well-maintained infrastructure
- Vast and well-managed sports ground and gymnasium
- Clean and green campus
- Eco-friendly premises
- Achievements in sports and cultural activities

### College Campus:

The college is spread over 4.67 acres of land with plenty of open space and sports area interspersed within academic buildings.

  
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### 3. Energy Audit

Energy audit helps to understand more about the ways energy is used in any plant and helps in identifying areas where waste may occur and scope for improvement exists. The overall energy efficiency from generation to final consumer becomes 50%. Hence one unit saved in the end user is equivalent to two units generated in the power plant. (1 Unit/0.5 Efficiency = 2 Units) Energy audit is the most efficient way to identify the strength and weakness of energy management practices and to find a way to solve problem. Energy audit is one kind of professional approach towards a responsible way in utilizing economic, financial, and social and natural resources. Energy audits can "add value" to the management approaches being taken by the institute and is a way of identifying, evaluating the system.

#### Objectives of Energy Auditing

The energy audit provides the vital information base for overall energy conservation program covering essentially energy utilization analysis and evaluation of energy conservation measures.

#### It aims at:

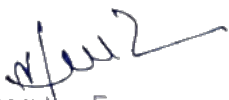
- Identifying the quality and cost of various energy inputs.
- Assessing present pattern of energy consumption in different cost centers of operations.
- Relating energy inputs and production output.
- Identifying potential areas thermal and electrical energy economy.
- Highlighting wastage in major areas.
- Fixing of energy saving potential targets for individual cost centers.
- Implementation of measures for energy conservation & realization of savings.


### 3. Present energy scenario

#### Electricity supply and Billing:

#### Electricity supply

The college is getting electrical supply by the UHBVN, Haryana. There is one energy meter installed in the premises. There is a transformer capacity 100kw.

  
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## Sanction Demand

The sanctioned demand for the load 19.90Kw from UHBVN, Haryana. Its sanctioned demand kw varies every month because of change of power factor every month. The recorded running maximum demand of the college from the electricity bill is given below.

Date	Time Period	Total Consumed Unit	Solar Generated Unit	Bill Unit	Bill Amount
15/02/2022-15/04/2022	59 days	3001	2700	301	2296
20/08/2022-31-10-2022	72 days	7467	2198	5269	40190
31-10-2022 -15-12-2022	45 days	2793	2053	740	5645
15-12-2022-20-02-2023	67days	2301	1386	915	6979
20-02-2023-20-04-2023	59 days	2363	2945	00	00

## 5. Energy Sources

Electricity is the major energy sources of the college. Electricity is supplied by UHBVN, limited, Haryana. Diesel oil is being used in the DG sets for in-house generation of electricity during power-cut.

## 6. DG Set:

There is a DG set available in the college of capacity 62.5 kvA for in house generation of electricity . As the power Supply is very good in the area so the running hour of DG set is very less.



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➤ **Solar Power Generation : Grid connected Solar Photovoltaic System (18 kwp)**


There 18 kwp Solar Photovoltaic roof top grid connected system installed on college building 4 nov.2019.The SPV is connected with the LT supply with some relay/sensor which keeps senses of electrical supply. When there is electrical supply , the SPV will generate electricity .As the electrical supply goes off, the SPV will not generate any electricity .SP will also not generate electricity when there is electrical supply of DG set.


Sr.no	Description	Technical Specification
1	Model Type	Adani &ASP-7-335
	<b>Panel</b>	<b>Information</b>
2	Panel wattage	335 watt(36nos) 330 watt(18 nos)
3	No.of PV panels	54
4	Panel tilt angle	25 <sup>0</sup>
	<b>Inverter</b>	<b>Information</b>
5	Company name	Havells
6	FG code	SSSSLR0019
7	Capacity	20KW

**Outcomes:**

The best use of SPV is to put all lighting, exhaust fan load, fan load etc. on it. Some intelligent relay/ sensor need to install for better management. The energy meter should also be calibrated by third party once in a year or two years. This way, the SP will continue supply even there is utility supply available or not and it will also help in saving a substantial amount in the electricity bill. It was also observed that electrical data like daily/ weekly/ monthly units generated by SPV are not recorded in the register or in soft copy.

Date	Solar Generated unit
15/02/2022-15/04/2022	2700
20/08/2022-31/10/2022	2198
31/10/2022-15/12/2022	2053
15/12/2022-20/02/2023	1386
20/02/2023-20/04/2023	2945
<b>Total</b>	<b>11282</b>

  
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➤ **Net metering**

The SPV system should be installed along with Net metering system. For this, there is a power format in the concerned UHBVN office to install Net metering



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## **Advantage of Net Metering**

### **Financial benefit for the system owner.**

Since the system owner is charged for the net energy consumed from the utility grid, the owner gets financial benefits. If energy generation energy consumed: owner pays just for the net amount. If energy generation energy consumed: the owner gets credit for excess generation.

### **Avoid the use of batteries.**

In a grid connected solar pv system, any excess energy generated can be fed back to local utility grid and can be taken back at later stage when required. Thus, there is no need to store the surplus energy in batteries for later use, thus, avoiding the heavy costs of batteries. Also, since batteries are eliminated, the maintenance costs of the system also reduce to a great extent. Batteries may be required only when there are frequent power fluctuations/outages.

### **Produce more today, use that tomorrow**

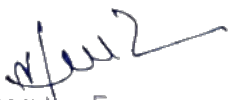
If there is a surplus of power generation than the consumption, the surplus can be fed into grid system and if consumption increases.


## **6. Energy Consumption**

For the Unit/college, the applicable electrical tariff is in two part i.e. a fixed cost (Demand Charges) and unit (kWh) rate.

### **Use of Electricity During Peak hour and off peak hour**

The applicable electricity tariff is not also based on timing of the day but it may not be applicable in case of domestic LT/ HT type connection. This will also helpful in maintaining the demand graph. It is recommended to avoid use of electrical gadget for cleaning, watering etc. during the peak hours. This type of work should be operational during the off peak hour.

  
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## ➤ Distribution Network

There is a main electrical panel installed near the DG Set. All the distribution cables are going from the main panel to all the buildings, submersible pump, street light etc. Sub panels are installed in the buildings. There is a taping on each floor from the raising mains.

During the study, it was observed that the conductor size is good according to ampere load. No any conductor was found over heated or its insulation burnt. Adequate size of conductor is going to feed the utility area. So, distribution losses are within the limit.

## Certificate

Energy Audit  
Recommendation by the Inspection committee

This report is based on the present operating status of the educational institution. The recommendations are based on various operational parameters examined and the information supplied by the management of S.D. Mahila Mahavidyalaya, Narwana.

Inspection of the institute is carried out and the following areas have been covered in the study:

1. Electricity Bill
2. Distribution Network
3. DG Sets
4. Lights (Illumination)
5. Air conditioning Load
6. Solar Power etc.

1. The Running maximum Demand (kVA) of the college varies from 9.71kVA to 18kVA against sanctioned load of 19.90kW. The running maximum Demand depends on power factor which also varies from 0.88 to 0.98 and average monthly P/F. is 0.93.
2. The average monthly power factor is 0.93 which is good. If the power factor improves to 0.99 or unit (1) then it will further reduce the electricity cost per year. Moreover, it is also observed that electricity units consumed is much less than the units generated by the installed solar system and supplied to grid which reduce the bill in minus/ profit to the consumer.
3. Lux level in the classroom at the entrance wall needs to be improved. It is advisable to put some more energy efficient lightning for better light intensity.
4. Sufficient Fire extinguishers must be provided near DG set and MCCB box to meet the emergency conditions.

Consistent compliance of relevant provisions of CEA (Measures Relating to Safety & Electric Supply) Regulations, 2010 must be ensured in the installations at your end.

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