

# **GUIDELINES FOR IMPLEMENTATION OF THE ENERGY AUDIT SCHEME IN PRIVATE, GOVERNMENT, SEMI GOVERNMENT, INDUSTRIAL AND INSTITUTIONAL BUILDINGS**

## **1. OBJECTIVE**

The objective of the scheme is to identify areas where excess energy consumption or wastage of energy is taking place. It involves measuring the actual energy consumption of various electrical gadgets used in the plants/buildings, comparing it with an estimate of the minimum energy required to undertake the process and establishing technically and economically feasible means to achieve the same & suggest best ways to optimize the energy consumption leading to energy saving and money saving in electricity bills.

## **2. ELIGIBLY CRITERIA**

**Category A:** All Private, Industrial, Institutional, Commercial buildings owners of Haryana and categories which are not included in categories B below will be eligible for the state subsidy of 50% of cost of energy audit subject to maximum of Rs 50,000.

**Category B:** Energy Audit of Haryana Govt. buildings / State Semi. Government buildings including buildings owned by Haryana Semi government Institutes/ universities, Semi. Govt. enterprises, corporations, boards, Joint ventures institutes/ universities of Haryana Government Departments etc having connected load above 100 KW who undertakes to implement at least 50% recommendations of the energy audit report would be facilitated / conducted free of cost by the New and Renewable Energy department, Haryana.

## **3. SCOPE OF WORK**

**A)** Review of present electricity, fuel oil & estimation of energy consumption in various load centers like lighting, air-conditioning, water pumping etc.

### **B) Electrical Distribution System**

- (i) Review of present electrical distribution like Single Line Diagram (SLD), transformer loading, cable loading, normal and emergency loads, electricity distribution in various areas/ floors etc.
- (ii) Study of Reactive Power Management and option for power factor improvement.
- (iii) Study of power quality issues like Harmonics, current unbalance, voltage unbalance etc.
- (iv) Exploring the Energy Conservation Options (ENCON) in electrical distribution system.

### **C) Lighting System**

- (i) Review of present lighting system, lighting inventories etc.

- (ii) Estimation of lighting load at various locations like different floors, outside (campus) light, pump house and other important locations.
- (iii) Detail lux level survey at various locations and comparison with acceptable standards.
- (iv) Study of present lighting control system and recommend for improvement.
- (v) Analysis of lighting performance indices like Lux/m<sup>2</sup>, lux/ watt, lux/watt/m<sup>2</sup> and comparison with norms of high rise buildings.
- (vi) Exploring the Energy Conservation Options (ENCON) in lighting system.

#### **D) Heating, Ventilation & Air Conditioning System (HVAC System)**

- (i) Review of present HVAC system like central AC, window AC, split AC, package AC, Water Coolers and Air Heaters etc.
- (ii) Performance assessment of window AC, split AC and package AC system.
- (iii) Performance Assessment of Chillers, Cooling Towers, Air Handling Units (AHUs) and cold insulation system of central AC.
- (iv) Analysis of HVAC Performance like estimation of Energy Efficiency Ratio (EER i.e. KW/TR), Specific Energy Consumption (SEC) of Chilled Water Pumps, Condenser Water Pumps, AHUs etc. and comparison of the operating data with the design data.
- (v) Exploring the Energy Conservation Options (ENCON) in HVAC system.

#### **E) Diesel Generator (DG) sets**

- (i) Review of DG set operation
- (ii) Performance Assessment of DG sets in terms of Specific Fuel Consumption (SFC i.e. KWH/Liter), Exploring the Energy Conservation Options (ENCON) in lighting system.
- (iii) Exploring the Energy Conservation Options (ENCON) in DG sets

#### **F) Water Pumping Systems**

- (i) Review of water pumping, storage and distribution systems
- (ii) Performance assessment of all major water pumps i.e. power consumption vs. flow delivered, estimation of pump efficiency etc.
- (iii) Exploring the Energy Conservation Options (ENCON) in Water Pumping System.

#### **G) Thermic Fluid Heaters/ Boilers**

- (i) Performance assessment of hot water generators or thermic fluid heaters like estimation of efficiency etc.
- (ii) Exploring the ENCON options in electric drive system.

#### **H) Motor Load Survey**

- (i) Conducting the motor load survey of all drives to estimate the % loading.

- (ii) Exploring the ENCON options in electric drive system.

### **I) Energy Monitoring & Accounting System**

- (i) Detail review of present energy monitoring and accounting system in terms of metering, record keeping, data logging, periodic performance analysis etc.
- (ii) Recommend for effective energy monitoring and accounting system.

### **J) Others**

- (i) Review of present maintenance practice, replacement policies and building safety practices as applicable to high rising buildings and recommend for improvements.
- (ii) Cost benefit analysis indicating investment , Energy saving and pay back period.
- (iii) Preparation of DPR and submission of the same to the SDA.
- (iv) Connected load of the building in KW
- (v) Area of the building.
- (vi) Lux level, power factor and COP and energy efficiency of various energy consuming systems used in the buildings for which energy audit shall be carried out along with specifications; make of testing equipments shall be used in the study.

## **4. HIRING SERVICES OF ENERGY AUDITOR**

The building owners (except category B having connected load above 100 kW) shall hire the services of BEE certified Energy auditor through competitive bidding / Implementation procedure and guidelines formulated by DNRE/ HAREDA and respective district Project officers/Assistant Project Officers shall be the committee member to decide the rate.

For Category B having connected load above 100 kW, services of BEE certified Energy auditor shall be hired through competitive bidding / Implementation procedure and guidelines formulated by DNRE/ HAREDA to decide the rate for conduct of energy audit and energy audit shall be facilitated by Department / HAREDA accordingly.

## **5. IMPLEMENTATION METHODOLOGY**

**Category A** i.e. all Private, Industrial, Institutional, Commercial buildings owners including those who are not covered in category B want to avail subsidy shall apply to the ADC-cum-CPO of the respective district in the prescribed format or directly to the Director General, DNRE/HAREDA, Panchkula. **The subsidy will be released in two parts to the building owner. The first installment of 50% will be released after acceptance of energy audit report by the committee of two project officers of head office & Scheme in**

**Charge. The remaining 50% will be released after the 50 % implementation of energy audit report suggested by the energy auditor and on receipt of 50 % implementation certificate duly certified by the concerned district Project Officers/Asstt. Project Officers.**

**For Category B** buildings owners (having connected load above 100 kW), shall apply to the concerned ADC-cum-CPO of the respective district in the prescribed format or directly to the Director General, DNRE/HAREDA, Panchkula. 100% Cost of energy audit per building (Discovered through competitive bidding / implementation procedure) having connected load above 100 kW will be borne by the Department subject to availability of funds. The free energy audit shall be conducted only for the departments who undertake to implement at least 50% recommendation of energy auditor within one year or as per phasing of the energy auditor in its report.

## **6. FINANCIAL INCENTIVE TO THE USER**

**Category A:** Under the scheme owners of the building (except Category B having connected load above 100 kW) shall be provided with financial assistance @ 50 % of the Energy Audit cost with the Maximum limit of Rs. 50000/- in two parts:

**Part –I** 50% will be released after acceptance of energy audit report certified by the approved committee.

**Part-II** Remaining 50 % will be released after the 50 % implementation of energy audit report suggested by the energy auditor and on receipt of 50 % implementation certificate(Format-II) duly certified by the concerned district Project Officers/Asstt. Project Officers

**Category B:** Category B buildings owners (having connected load above 100 kW), 100% Cost of energy audit per building (Discovered through competitive bidding / implementation procedure) having connected load above 100 kW will be borne by the Department subject to availability of funds.

(Annexure-I)

**PRESCRIBED FORMAT**

**FOR THE ENERGY AUDIT IN PRIVATE, GOVT.,SEMI GOVT.,INDUSTRIAL,INSTITUTIONAL AND COMMERCIAL BUILDINGS.**

1.	Name of the building/unit	
2.	Complete address of the building/unit	
3.	Name of the owner	
4.	Telephone No. of Contact Person	
5.	Aadhaar Card / PAN Card no. / TIN No.	
6.	Fax No. & E-mail address	
7.	Nature of establishment whether Private, Govt., Semi Govt., Industrial, Commercial, Institutional building	
8.	Connected Load (KW) or Contract Demand (KVA)	
9.	Installed Capacity :DG sets (KVA)	
	A) Annual electricity consumption , purchased from utilities (KWH)	
	B) Annual electricity consumption, through Diesel Generating (DG) sets (kwh)	
	C) Total Annual Electricity consumption utilities + DG sets(KWH)	
10.	Built up area of the building in square mtr.	
11	Whether Energy Audit was conducted in last three years	

Certificate:

It is certified that I am interested to take up the Energy Audit of my unit/building and giving undertaking to implement the 50 % energy audit report suggested by the energy auditor.

Date \_\_\_\_\_

Signature of the building owner

IMPLEMENTATION CERTIFICATE TO BE ISSUED BY THE PO/APO OF CONCERNED DISTRICT

The undersigned has visited the Unit/building and certified that the beneficiary has implemented the 50 % of potential savings suggested by the energy auditor in the energy audit report of his unit/building.

Signature of Verifying Officer

with seal(PO/APO of concerned district)

Name

Designation

Date