TEMPLATES FOR CALCULATING ENERGY SAVINGS

Following tables can be used for conducting and showing step-by-step calculations for energy savings in different areas:

A) Saving for Lighting

S. No.	Item	Formula	Unit	Remarks
1.	No. of running hours per day	H	Hrs	As per baseline
2.	No. of actual working days per month	D	Days	From actual month calendar
3	Average consumption per existing tubelight	Wl	Watts	As per baseline
4	Total no. of fittings	Ns	No.	To be replaced by efficient lighting
5.	Total no. of excess lighting points (e.g. of ceiling illumination)	Nd	No.	To be disconnected since identified as excess lighting points
6.	Rate of electricity	R	Rs/kWh	As per electricity bill
7-	Average consumption per lighting point after modification	W2	Watts	From actual measurement after modification
8.	Monthly saving due to delamping of lights which are extra (e.g. lights for ceiling illumination)	Sd = Nd*W1*H* D/1000	kWh	Calculated
9.	Monthly saving due to modification of single fitting	Ss = Ns* (W1-W2)*H*D/1000	kWh	Calculated
10.	Total monthly saving	S = Sd + Ss	kWh	Calculated
11.	Total monthly amount saved due to lighting modification	A= S*R	Rs	Calculated

It should be ensured and declared that the lighting level after the proposed retrofitting would not be below recommended lighting levels according to nature of activity.

B) Saving for Pump

S.No.	Item	Formula	Unit	Remarks
1.	No. of running hours per day	H	Hrs	As per baseline
2.	Present power consumption of pump	PI	kW	Measured
3.	Present water flow rate	FI	MVSec.	Measured
4	Present head developed	Hdl	Metre	Measured
5.	Present pump efficiency	E1=9.81*Hd1*F1*100/P1	%	Calculated
6.	Rate of electricity	R	Rs/kWh	
7.	Power consumption of new pump	P2	kW	From actual measurement after modification
8.	Water flow rate from new pump	F2	MVsec.	Measured
9.	Head developed by new pump	Hd2	Metre	Measured
10.	New pump efficiency	E2=9.81*Hd2*F2*100/p2	%	Calculated
11.	Energy saving/month	Se=(H*P1*(E1-E2)/100	kWh	Calculated
12.	Total monthly amount saved due to the modification	A = Se*R	Rs.	Calculated

c) Saving for changing from electric heating to gas heating

S.No.	Item	Formula	Unit	Remarks
1.	Total LPG consumption for heating water	Ncyl	No.	As per baseline
2.	Total energy consumption for heating water	Et	kWh	As per baseline
3.	LPG Consumption to achieve the desired temperature if required	N (cylfut)	No.	From current month
4.	Rate of electricity	RO	Rs./kWh	As per baseline
5.	Rate of LPG cylinder	R1	Rs./ Cyliner	As per baseline
6.	Saving due to redundancy of boiler and geyser	Se = Et*RO	Rs.	Calculation
7.	Saving due to Reduced usages of LPG	Slpg = (Nycl- N (cylfut)* R1	Rs.	Calculation
8.	Total savings	S = Se + Slpg	Rs.	Calculation

D) Saving for HVAC system

1) AC system

S.No.	Item	Formula	Unit	Remarks
I.	No. of running hours per day	H	Hrs	As per baseline
2.	No. of actual working days per month	D	Days	From actual month calenda
3.	Total no of window a/c units	Nwac	Nos.	As per baseline
4.	Specific power consumption for window a/c unit	SPCwac	kW/TR	As per baseline
5.	Energy consumption for new screw chiller	Psc	kWh	From actual metering
6.	Total TR developed by new chiller	Ttr	Ton-hour	From actual metering
7.	Minimum Ton-hour developed by new chiller (based on the current running pattern & 75% loading) month	Trmin.	Ton-hour	As per baseline
8.	Ton-hour considered for calculation	Teal = Max. of (Ttr of Trmin.)	Ton-hour	As per baseline
9.	Energy consumption by auxiliaries like Ch. W pump, Cond W Pump, CT and FCU's.	Paux	kWh	From actual measurement after modification
10.	Total energy consumption by new Chiller System	Ptotal=Psc+Paux	kWh	Calculated
11.	Specific power consumption of New Chiller	SPCsc=Ptotal/Ttr	kW/TR	Calculated
12.	Estimated consumption for existing system for future running hours.	Pexis = SPCwac* Teal	kWh	Calculated
13.	Monthly saving due to modification of A.C. System	5=Pexis-Ptotal	kWh	Calculated
14.	Rate of electricity	R	Rs/kWh	From current bill
15.	Total monthly amount saved due to A.C modification	A=S*R	Rs.	Calculated

D) Saving for HVAC system

2) Room heating system

S.No.	Item	Formula	Unit	Remarks
1.	Total no of heaters	Nh	Nos.	As per baseline
2.	Rating of each heater	Rh	kW	As per baseline
3.	Running hours per month	H	Hrs	As per baseline
4.	Energy consumption per month	Ph=Nh*Rh*H	kWh	Calculated
5.	Fuel consumption for hot water generator	F	Lit	From actual metering
6.	Future rate of fuel	Rf	Rs/lit	Market rate
7.	Energy consumption for pump and FCU's	Pp	kWh	From actual metering
8.	Monthly energy cost for heating system	C=(F*Rf)+Pp* R)	Rs/month	Calculated
9.	Total monthly amount saved due to Heating System modification	A=(Ph*R)-C	Rs/month	Calculated