

## PAYBACK CALCULATION SHEETS FOR VARIOUS SYSTEMS

### Saving Calculation for Lighting

#### A) Present Status

S. No.	Parameter	Value	Unit	Remarks
1.	Present rate of electricity		Rs	
2.	Consumption for existing tube light		W	
3.	Total no. of tube lights being replaced from rooms		No	
4.	Operating hours/year		hour	
5.	No. of tube lights being replaced from other places (e.g. staircase)		No.	
6.	Operating hours/year		hour	

#### B) Proposed Modification (sample)

1.	Replacing each FTL with high lumen TL& Electronic ballast		W	
2.	Delamping the single FTL which illuminates the ceiling		No.	

#### C) Saving

1.	Saving on account of replacing FTL in rooms		kWh/ year	
2.	Saving due to delamping		kWh/ year	
3.	Total energy saved due to lighting modification		kWh/ year	
4.	Total amount saved due to lighting modification		Rs lakhs	

#### D) Investment

1.	Cost per high lumen TL with electronic ballast		Rs.	
2.	Total Investment		Rs lakhs	

#### E) Payback

Years

## Saving Calculation for Pump

### A) Present Status

S.No.	Parameter	Value	Unit	Remarks
1.	Present rate of electricity		Rs	
2.	Rating of pump		kW	
3.	Power consumption pump		kW	
4.	Present efficiency of motor-pump unit		%	
5.	Running hours of pump during working day		hours	
6.	Running hours of pump during holiday		hours	
7.	No. of working days/month		days	
8.	No. of holidays/month		days	
9.	Pump running months/year		months	
10.	Annual energy consumption		kWh	
<b>B) Proposed Modification:</b>				
1.	Replace the motor-pump with a mono block pump set			
2.	Motor-pump efficiency of new pump		%	
<b>C) Saving</b>				
1.	Annual energy saving due to replacement		kWh/year	
2.	Total amount saved due to replacement		Rs	
<b>D) Investment</b>				
1.	Capital investment for the mono block pump		Rs.	
<b>Payback</b>			Year	

### Saving calculation for pantry/canteen area

S. No.	Parameter	Value	Unit	Remarks
<b>A) Present Status</b>				
<b>LPG</b>				
1.	Average consumption of LPG cylinders per month.		No.	
2.	Cylinders used only for heating water.		No.	
3.	Capacity of each LPG cylinder		kg	
4.	Total LPG consumption for heating water		kg	
5.	Cost of LPG per kg		Rs	
<b>electricity</b>				
6.	Power consumption of geyser used for plate washing (hot water)		kW	kW* No. (for each type)
7.	Power consumption of boiler in pantry		kW	kW* No. (for each type]
8.	Running hours of boiler in pantry per day		Hrs	
9.	No. of actual working days per month		Days	
10.	Total kWh consumption for the year		kWh	Calculated
11.	Cost of electricity per kWh		Rs.	
<b>B) Established facts :</b>				
1.	100 litres of solar hot water system can save electricity per		kWh	
2.	100 litres of solar hot water system can save LPG per year		kg	

## Saving calculation for pantry/canteen area

S.No.	Parameter	Value	Unit	Remarks
<b>C) Modification:</b>				
1.	No. of 100 litres capacity system required to replace the annual consumption of cylinders/year		No.	
2.	No. of 100 litres capacity system required to replace the 'x' kWh/year		No.	
3.	Total No. of collectors required		No.	
4.	Nearest standard system capacity available		No.	
<b>D) Saving:</b>				
1.	Saving due to LPG replacement		Rs.Lakhs	
2.	Saving due to electricity replacement		Rs.Lakhs	
3.	Total saving		Rs.Lakhs	
<b>E) Investment:</b>				
1.	Cost of 'y' LPD system		Rs.Lakhs	
<b>F) Payback Period</b>			Years	

## Saving calculation for HVAC system

Cooling	Average SPC of existing air conditioners		kW/TR
	Present condensing temp, (winter season)		deg.C
	Average condensing temp. during summer		deg.C
	Increase in SPC of compressor due to higher condensing temp. (Taking that for every 1 deg. C rise in condensing temp., there is 2.0 % increase in SPC of compressor)		%
	Expected SPC of air conditioners during summer		kW/TR
	Presently installed capacity of AC with a diversity of 25%		TR
	Capacity of central AC system required		TR
	Installed window AC		Nos
	Installed AC load		kW
	Present AC running load from Energy bill		kW
	Presently delivered TR		TR
	Loading with Cenetral AC plant with 75%		TR
	Power required by central plant/TR		kW
	KW consumption of central AC plant with 75% loading		kW
	Power Saving		kW
	Working Hrs /day		
	Working days /year		
	Working Hrs /Yr		
	Energy cost		Rs/kWh
	Energy saving kWh /year		kWh
	Energy saving Rs. /year		Rs Lakhs

### Saving calculation for HVAC system

Heating	Room heating Load for two months/year		kW
	Energy consumed for room heating /Year		kWh
	Energy cost/yr		Rs Lakhs
	<b>Equivalent kcal (capacity of hot water generator)</b>		<b>Lakh kcal</b>
	Hot water flow required to carry the above heat (35/40 deg. C)		M <sup>3</sup> /Hr
	Calorific value of LDO		kcal/kg
	Thermal efficiency of hot water generator		%
	Annual LDO requirement		kg
	Cost of LDO/Kg		Rs.
	Running energy cost for pump & FC /year		Rs. Lakhs
	LDO cost/year		Rs. Lakhs
	Annual savings		Rs. Lakhs
Total system	Total saving		Rs. Lakhs
	<b>Investment</b>		
	Central AC plant		Rs. Lakhs
	Hot Water generator		Rs. Lakhs
	Total		Rs. Lakhs
	Payback period		Years