



Reckon Green Innovations Pvt Ltd

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Energy Efficiency Retrofit project: IFHE Campus- Saving Projections, Payback & ROI Calculations

Assumptions: Annual Working Days 230 Energy cost /kVAh 8.4 Demand Charges/kVA /month 385

Existing Electrical loads	Qty	Load	Load	Duty Cycle		Load	Energy Units/year		Energy Cost/yr
	Nos.	Watts	kW	Hrs/day	Pf.	kVA	kVAh	KWh	kVAh
2 x 2 down light Fixtures	1235	67.46	83.31	8	0.954	87.33	1,60,688	1,53,296	13,49,777
2 x2 LED down light fixtures	30	67.46	2.02	8	0.954	2.12	3,903	3,724	32,788
2x 36watts 4feet tube light fixtures	1874	89	166.79	8	0.506	329.62	6,06,495	3,06,886	50,94,554
2x 36watts mirror optic tube light	694	89	61.77	8	0.56	110.30	2,02,945	1,13,649	17,04,742
2 x 18watts Tube light fixtures	31	38	1.18	8	0.56	2.10	3,871	2,168	32,513
2x18w round fittings	1598	38	60.72	8	0.98	61.96	1,14,012	1,11,732	9,57,704
2x18w Down light	36	38	1.37	8	0.98	1.40	2,568	2,517	21,575
2x 11w Square light Fixtures	598	24	14.35	8	0.98	14.64	26,947	26,408	2,26,352
2 x 11watts Round light Fixtures	160	24	3.84	8	0.98	3.92	7,210	7,066	60,562
2 x 11w light Fixtures	15	24	0.36	8	0.98	0.37	676	662	5,678
2x 5watts Night lamp Light	456	10	4.56	8	0.98	4.65	8,562	8,390	71,918
1x 36 Watts box type Tube light	3371	44.53	150.11	8	0.51	294.33	5,41,576	2,76,204	45,49,235
1x36watts patti fittings	291	44.53	12.96	8	0.51	25.41	46,751	23,843	3,92,711
1 x 18watts Tube light fixtures	40	19	0.76	8	0.51	1.49	2,742	1,398	23,032
1 x 11w Down light	26	11	0.29	8	0.98	0.29	537	526	4,511
1x 11 light fixtures	4432	11	48.75	8	0.98	49.75	91,534	89,704	7,68,889
Dome Light Fixtures	524	18	9.43	8	0.98	9.62	17,709	17,355	1,48,756
2x18watts oval Doom Light	130	38	4.94	8	0.98	5.04	9,275	9,090	77,911
Spot Light	55	50	2.75	8	0.98	2.81	5,163	5,060	43,371
Bulk Head light Fixtures	25	11	0.28	8	0.98	0.28	516	506	4,337
Metal Hallied / Sodium vapour	3	250	0.75	8	0.98	0.77	1,408	1,380	11,829
Halogen lamp	8	50	0.40	8	0.98	0.41	751	736	6,309
1x250w Street light poles	146	260	37.96	10	0.98	38.73	89,090	87,308	7,48,354
4x400W Metal Hallied tower light	20	1600	32.00	5	0.98	32.65	37,551	36,800	3,15,429
3x250W Metal Hallied tower light	10	750	7.50	5	0.98	7.65	8,801	8,625	73,929
1x250W Metal Hallied tower light	19	250	4.75	5	0.98	4.85	5,574	5,463	46,821
8x250W Metal Hallied tower light	1	2000	2.00	5	0.98	2.04	2,347	2,300	19,714
Ceiling fan	5462	83.9	458.26	8	0.99	462.89	8,51,719	8,43,202	71,54,439
wall mounted Fan	98	55	5.39	8	0.98	5.50	10,120	9,918	85,008
Total Existing Load/ Energy Consumption			1179.55			1562.93	2861041	2155915	24032747

Total Connected Lighting and Fans Load- kW: 1180
% of Loads working : 50%
Net load kW: 589.773
Net Load kVA: 781.464

12503

Proposed Efficient Loads	Qty	Load	Load	Duty Cycle		Load	Energy units/year		Energy Cost/yr
	Nos.	Watts	kW	Hrs/day	Pf.	kVA	kVAh	KWh	kVAh
2 x2 Fixtures- 2G11 LED PL *2 nos	1235	32	39.52	8	0.98	40.33	74,201	72,717	6,23,287
2 x2 LED down light fixtures	30	32	0.96	8	0.98	0.98	1,802	1,766	15,141
2x 14W LED Tube Lights	1874	28	52.47	8	0.98	53.54	98,519	96,548	8,27,558
2x 14 watts LED tube lights	694	28	19.43	8	0.98	19.83	36,485	35,755	3,06,470
2 x 8 watts LED Tube lights	31	16	0.50	8	0.98	0.51	931	913	7,823
12w LED round fittings	1598	14	22.37	8	0.98	22.83	42,005	41,164	3,52,838
10w LED Down light	36	10	0.36	8	0.98	0.37	676	662	5,678
10 w Square light Fixtures	598	10	5.98	8	0.98	6.10	11,228	11,003	94,313
10 watts LED Round light Fixtures	160	10	1.60	8	0.98	1.63	3,004	2,944	25,234
10 w LED light Fixtures	15	10	0.15	8	0.98	0.15	282	276	2,366
0.5 watts LED Night lamp	456	0.5	0.23	8	0.98	0.23	428	420	3,596
1x 14 Watts LED Tube lights	3371	14	47.19	8	0.98	48.16	88,609	86,837	7,44,317
1x14 watts LED Tube lightts	291	14	4.07	8	0.98	4.16	7,649	7,496	64,253
8 watts LED Tube lights	40	8	0.32	8	0.98	0.33	601	589	5,047
5W LED Down light	26	5	0.13	8	0.98	0.13	244	239	2,050
5W LED fixtures	4432	5	22.16	8	0.98	22.61	41,607	40,774	3,49,495
7 W LED Doom Light Fixtures	524	7	3.67	8	0.98	3.74	6,887	6,749	57,850
10watts LED oval Doom Fixtures	130	10	1.30	8	0.98	1.33	2,441	2,392	20,503
5W LED Spot Lights	55	5	0.28	8	0.98	0.28	516	506	4,337
5W LED Bulk Head light Fixtures	25	5	0.13	8	0.98	0.13	235	230	1,971
90W LED light fixtures	3	90	0.27	8	0.98	0.28	507	497	4,258
10W LED Flood lights	8	10	0.08	8	0.98	0.08	150	147	1,262
50w LED Street lights	146	50	7.30	10	0.98	7.45	17,133	16,790	1,43,914
4x175W LED Flood tower light	20	525	10.50	5	0.98	10.71	12,321	12,075	1,03,500
3x120W LED tower light	10	360	3.60	5	0.98	3.67	4,224	4,140	35,486
1x120W LED tower light	19	120	2.28	5	0.98	2.33	2,676	2,622	22,474
8x120W LED tower light	1	960	0.96	5	0.98	0.98	1,127	1,104	9,463
BLDC Ceiling fan 1200mm	5462	28.75	157.03	8	0.98	160.24	2,94,837	2,88,940	24,76,627
wall mounted Fan	98	30	2.94	8	0.98	3.00	5,520	5,410	46,368
Total load/consumption after Efficiency			407.78			416.10	7,56,843	7,41,706	63,57,479

Project Outcome & Results:						3328.80			
Reduction/Saving	Kwh	65%	771.77			1,147	21,04,199	14,14,209	176,75,268

Connected Load after EE Project:	407.78	Results:			
% of Loads working :	50%	Reduction in load-kW:	386	Reduction in Energy Consumption/yr	21,04,199
Net load kW	203.89	Reduction % in kW:	65%	Energy cost saving/anum	176,75,268
Net Load-kVA	208.05	Reduction % in kVA	73%		

Energy Efficiency Cost & ROI

Description	Qty	Cost	Total
		/Unit	
2 x2 - 2G11 LED PL *2 nos	1235	1,500	20,74,800
2 x2 LED down light fixtures	30	1,500	50,400
2x 12W LED Tube Lights	1874	1,100	23,08,768
2x 12 watts LED tube lights	694	1,100	8,55,008
2 x 7 watts LED Tube lights	31	800	27,776
12w LED round fittings	1598	800	14,31,808
10w LED Down light	36	750	30,240
10 w Square light Fixtures	598	750	5,02,320
10 watts LED Round light	160	750	1,34,400
10 w LED light Fixtures	15	750	12,600
0.5 watts LED Night lamp	456	40	20,429
1x 12 Watts LED Tube lights	3371	550	20,76,536
1x12 watts LED Tube lightts	291	550	1,79,256
7 watts LED Tube lights	40	400	17,920
5W LED Down light	26	550	16,016
5W LED fixtures	4432	550	27,30,112
7 W LED Dome Light Fixtures	524	550	3,22,784
10W LED oval Doom Fixtures	130	750	1,09,200
5W LED Spot Lights	55	450	27,720
5W LED Bulk Head Fixtures	25	550	15,400
90W LED light fixtures	3	550	1,848
10W LED Flood lights	8	1,000	8,960
50w LED Street lights	146	4,500	7,35,840
4x175W LED Flood tower light	20	58,000	12,99,200
3x120W LED tower light	10	25,500	2,85,600
1x120W LED tower light	19	8,500	1,80,880
8x120W LED tower light	1	68,000	76,160
BLDC Ceiling fan 1200mm	5462	2,665	171,76,351
wall mounted Fan	98	2,800	3,23,792
Total Cost (Rs.) with GST			330,32,124
Transport cost			2,00,000
Installation labour cost			20,00,000
Total Project Cost (Rs.)			352,32,124

Benefits of Efficiency on Solar Power Plant CAPEX

Description	Existing	Efficient
Total Load kW before/after efficiency measures	1179.55	407.78
Solar Power Plant Size required in kWp	1774.42	610.46
Cost of Solar Power Plant @ Rs.45,000/kWp	798,48,695	274,70,587
Investment made on Efficiency	0	352,32,124
Total Cost of Project (Solar+EE)	798,48,695	627,02,711
Net saving on CAPEX	0	171,45,984

Paybak and ROI

Energy Saving /yr Rs.	176,75,268
Savings from CMD Reduction- kVA	
Savings in Maintenance Cost/yr	
Total Savings/year	176,75,268
Simple Payback period Yrs	1.99
ROI	50.17%

Summary:

Load Reduction- kW	772
CMD eduction-kVA	1,147
Annual Energy Saving-kVAh	21,04,199
Investment Required-Rs.	352,32,124
Annual Energy Cost Saving-Rs.	176,75,268
Simple Payback period- Yrs	1.99
Simple Return on Investment %	50.17%



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