

**Life Cycle Cost Comparison
Lighting System Conversion
Example Office Building**

Assume:

	Year	Incandescent Lighting				Fluorescent Lighting				Summary	
		Energy cost \$/yr	Annual Materials	Annual Maintenance	Sum \$/yr	Energy Cost \$/yr	Annual Material	Annual Maintenance	Sum \$/yr	Difference \$/yr	Cumulative Cash Flow
100 Fixtures											
75 Watts-per-fixture incandescent											
20 Watts-per-fixture fluorescent											
2,500 Hours of life incandescent	0										-10,000
10,000 Hours of life fluorescent	1	3,510	86.86	1,498	5,094	936	584.81	374	1,895	3,199	(6,801)
	2	3,650	90.34	1,558	5,298	973	608.21	389	1,971	3,327	(3,474)
12 hours per day	3	3,796	93.95	1,558	5,448	1,012	632.53	405	2,050	3,398	(76)
6 days per week	4	3,948	97.71	1,558	5,603	1,053	657.83	421	2,132	3,472	3,396
52 weeks per year	5	4,106	101.61	1,558	5,765	1,095	684.15	438	2,217	3,548	6,944
3744 Total hours per year	6	4,270	105.68	1,558	5,934	1,139	711.51	456	2,306	3,628	10,572
	7	4,441	109.91	1,558	6,109	1,184	739.97	474	2,398	3,711	14,283
1.5 Replacement per year incandescent	8	4,619	114.30	1,558	6,291	1,232	769.57	493	2,494	3,797	18,079
0.4 Replacement per year fluorescent	9	4,804	118.88	1,558	6,480	1,281	800.36	512	2,594	3,886	21,966
\$ 10.00 replacement cost labor	10	4,996	123.63	1,558	6,677	1,332	832.37	533	2,697	3,979	25,945
\$ 0.58 cost per lamp incandescent	11	5,196	128.58	1,558	6,882	1,386	865.67	554	2,805	4,076	30,022
\$ 15.62 cost per lamp fluorescent	12	5,403	133.72	1,558	7,095	1,441	900.29	576	2,918	4,177	34,199
	13	5,620	139.07	1,558	7,316	1,499	936.30	599	3,034	4,282	38,481
\$ 0.125 cost per kWh	14	5,844	144.63	1,558	7,547	1,559	973.76	623	3,156	4,391	42,872
	15	6,078	150.41	1,558	7,786	1,621	1,012.71	648	3,282	4,504	47,376
\$ 100 first cost (per fixture)	16	6,321	156.43	1,558	8,035	1,686	1,053.21	674	3,413	4,622	51,998
	17	6,574	162.69	1,558	8,294	1,753	1,095.34	701	3,550	4,745	56,742
0.04 Inflation: 4%/yr	18	6,837	169.20	1,558	8,564	1,823	1,139.16	729	3,692	4,872	61,615
	19	7,111	175.96	1,558	8,844	1,896	1,184.72	758	3,839	5,005	66,619
	20	7,395	183.00	1,558	9,136	1,972	1,232.11	789	3,993	5,143	71,762
										\$ 81,762	34.02%

Internal Rate of Return

34.02% Internal Rate of Return (IRR)

Red = assumed values

(Internal Rate of Return is closely related to Net Present Value. The rate of return calculated by IRR is the interest rate corresponding to a zero net present value.)

See lecture notes for more detail on assumptions.