

Piyanai Kunna	
Engr 115	
Lab Thurs 2pm	
Oct. 12, 2012	
<p>According to the data analysis attached in the following page, installing the PV to collect solar power is not the best option for the city to spend \$10,000. For it's life span of 20 years, using solar energy will save the city \$9926 which would not cover the cost of installing the system. The alternative of replacing 1429 light bulbs through out the city with CFL will save the city \$149,143. The saving is significant eventhough the life span of the bulbs are only 12000 hours. Estimating a 12 hour day use, the bulbs will last about 3 years. The city can use the money saved from electric bills to fund the replacement again. Another option to keep in consideration is to replace 435 incandescent bulbs with LED bulbs. The longer life span combine with low energy requirement will save the city \$113,804,347 during a 5.7 years life span. The city should have enough funds to make additional replacement after the first year of using LED bulbs.</p>	

Input Parameter		
Project Budget (\$)	10000	
Electricity Cost (\$/kWh)	0,15	
PV Panel Cost (\$/m2)	700	
PV Efficiency (%)	12%	
PV Panel Life Span (yrs)	20	
Replacing the bulb option		
Type of Bulb	Manufactured Rated power	Measured Power
Incandescent	75	76,5
CFL	20	18,5
LED	6,7	6,7
Assumption		
Available Sunlight (hrs/day)		
Season		
Summer	12	
Winter	8	
Average	10	
Solar Data Analysis		
Conversion Constant	4,19	
Measure Condition	mV	Solar Radiation
Total Shade	3	12,57
Direct Sunlight	303	1269,57
Global	190	796,1
Partly Cloudy	85	356,15
Diffuse	50	209,5
Average		528,778
PV Option		
Panel Purchase (m2)	14,3	Bulbs Purchase
Watts Displaced	906,5	Watts Displaced
Energy Displaced (kWh)	66173	Energy Displaced (kWh)
Money Saved (\$)	9925,92	Money Saved (\$)

