



Existing Lighting Retrofit

Manufacturing/shop facility

5/20/2015

For

Mr Maker | **Company**

Maker's Metals

**Prepared By
Company**

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Executive Summary

Existing Lighting Retrofit

Initial Costs

	Existing HID	LED	LED + Control
Combined Materials & Labor	\$0	\$51,959	\$52,831
Rebates	\$0	(\$500)	(\$500)
Total	\$0	\$51,459	\$52,331

Average Year Operation Cost

	Existing HID	LED	LED + Control
Electricity Use	165,137 kWh	85,637 kWh	64,228 kWh
Electricity	\$19,816	\$10,276	\$7,707
Maintenance	\$1,035	\$37	\$37
Taxes	\$40	\$0	\$0
Total	\$20,891	\$10,313	\$7,744
Savings	--	(51 %) \$10,577	(63 %) \$13,147

10 Year Operating Cost (Present Value)

	Existing HID	LED	LED + Control
Electricity Use	1,651,370 kWh	856,373 kWh	642,280 kWh
Electricity	\$169,038	\$87,660	\$65,745
Maintenance	\$8,825	\$309	\$309
Taxes	\$338	\$0	\$0
Total	\$178,202	\$87,969	\$66,054
Savings	--	(51 %) \$90,233	(63 %) \$112,148

Comparison Metrics

Life Cycle Cost	\$178,202	\$139,428	\$118,385
Net Present Value	--	\$38,774	\$59,817
Simple Payback	--	4.86 Years	3.98 Years
Discounted Payback	--	5.34 Years	4.30 Years
Internal Rate of Return	--	15.83 %	21.57 %
Modified Internal Rate of Return	--	8.95 %	11.16 %
Cost of Waiting	--	\$881/Month	\$1,096/Month

Assumptions

Discount Rate	3.00 %
Electricity Rate	\$0.12/kWh
Electricity Escalation Rate	0.00 %
Reinvestment Rate	3.00 %
Sales Tax	9.00 %

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Discount Rate sometimes called the 'Owner's Cost of Money' is used to determine the 'Time value of Money'. This is the discount rate used to determine the value today of a future sum.

The IES recommends using a rate that reflects the business owner's average cost of using other peoples money, or the owners cost of capital (borrowing). If you have enough information about the owners finances you could calculate the 'weighted average cost of capital'. However, since this information is generally not available, the IES also allows you to use more commonly available information like the 'prime rate' currently charged by major lenders. Typical values for Opportunity rate range between 3-12%. If you enter an Opportunity rate of 0% future cash flows will not be discounted (not recommended).

Depreciation reduces the owners income tax liability by depreciating the value of lighting equipment linearly over time. Depreciation is only calculated if the owners income tax rate (0 %) and depreciation years (7) are greater than zero.

Life Cycle Cost is the total present value of initial costs (eg new luminaires, new controls, installation labor) as well as recurring annual costs (eg electricity, maintenance).

Net Present Value (NPV) is a value in today's dollar of making a decision of one system over another. NPV sums the discounted annual cash flows over the life cycle of the system. This is the difference between life cycle costs. The design option with the highest NPV should be preferred, although any option with a positive NPV should be considered.

Simple Payback refers to the period of time required to recoup the funds expended in an investment, or to reach the break-even point. The time value of money is not taken into account. Payback period measures how long something takes to 'pay for itself'. All else being equal, shorter payback periods are preferable to longer payback periods. Simple payback does not answer the question 'is a certain investment profitable?' Simple payback doesn't consider what happens after the investment is repaid.

Discounted Payback takes into account the discount rate and uses the present value cash flows instead of the future value cash flows used in Simple Payback.

Internal Rate of Return is an indicator of the efficiency, quality, or yield of an investment. This is in contrast with the Net Present Value, which is an indicator of the value or magnitude of an investment. IRR cannot be calculated for some cash flows.

Modified Internal Rate of Return is an improved version of the internal rate of return (IRR) approach to capital budgeting decisions. It does not require the assumption that the project cash flows are reinvested at the IRR; rather, it factors in a discrete reinvestment rate (3.00 %) into the model. The design option with a higher MIRR should be preferred.

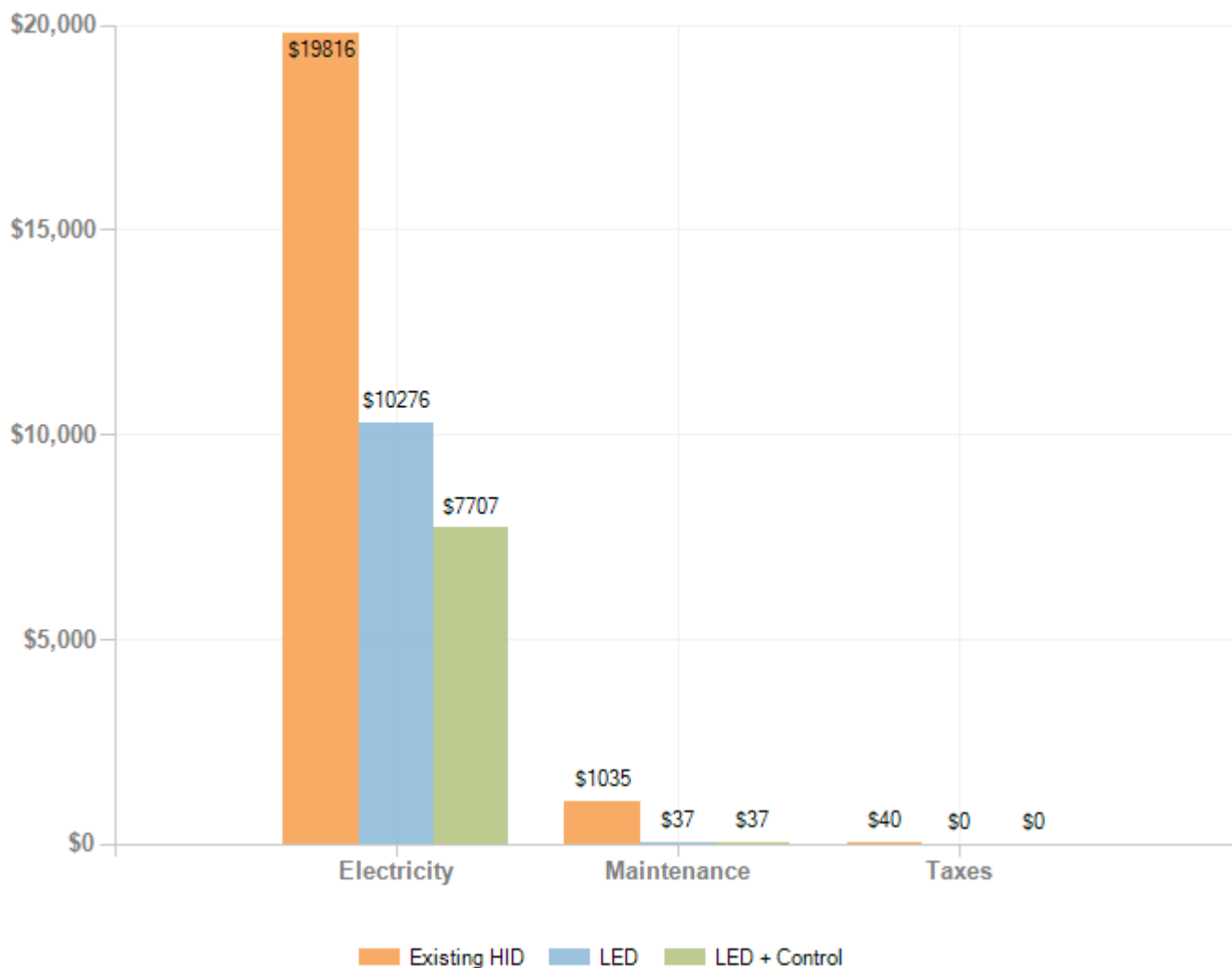
Cost of Waiting is the average annual operational savings divided by 12. If a new lower cost system was installed this is how much it would reduce monthly operating costs.

HVAC Cooling costs are the cost of cooling to offset the heat added to a building by lighting equipment. New cooling systems may or may not have additional savings due to reduced initial sizing of the air conditioning system. Operational costs are determined using the cooling hours, tons of cooling needed to offset lighting wattage, AC kwh/ton efficacy, and the electricity rate. AC maintenance cost are based on the tons of cooling figure and a per ton maintenance cost.

HVAC Heating savings are the savings in heating cost due to the heat from lighting equipment. The heating supplied by lighting is calculated using the space heating hours and lighting wattage. New systems may or may not be reduced in size based on the heat from lighting. This savings is calculated from lighting wattage and the efficacy of the heating unit \$/therm. Heating use savings are dependent on the wattage of the lighting system and the heating unit efficacy. Heating maintenance savings are based on therm from lighting and a heating maintenance rate \$/therm.

HVAC The reported HVAC value is the combination of cooling cost reduced by any heating savings.

Average Year Cost (Future Value)



Average Year Cost Details

	Existing HID	LED	LED + Control
Electricity Use	165,137 kWh	85,637 kWh	64,228 kWh
Electricity	\$19,816	\$10,276	\$7,707
<i>Included Reduction from Controls</i>	\$0	\$0	\$2,569
Maintenance	\$1,035	\$37	\$37
Taxes	\$40	\$0	\$0
Total	\$20,891	\$10,313	\$7,744
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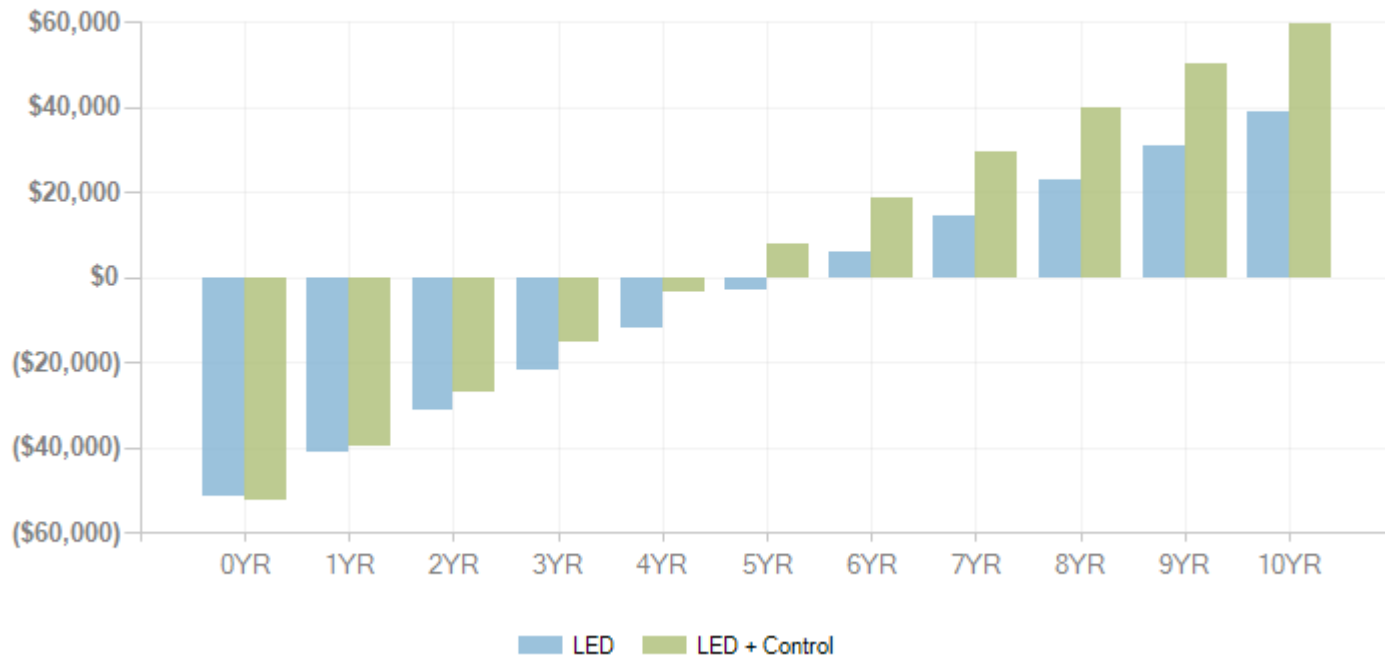
Lifecycle Comparison (Present Value)



Lifecycle Comparison Details

	Existing HID	LED	LED + Control
Combined Materials & Labor	\$0	\$51,959	\$52,831
Rebates	\$0	(\$500)	(\$500)
Electricity Use	1,651,370 kWh	856,373 kWh	642,280 kWh
Electricity	\$169,038	\$87,660	\$65,745
<i>Included Reduction from Controls</i>	\$0	\$0	\$21,915
Maintenance	\$8,825	\$309	\$309
Taxes	\$338	\$0	\$0
Total	\$178,202	\$139,428	\$118,385
Savings	--	(22 %) \$38,774	(34 %) \$59,817

Accumulated Cash Flow



Cash Flow Details

Years of Analysis	Existing HID Cost	LED Cost	LED Net Cash Flow	LED + Control Cost	LED + Control Net Cash Flow
Initial	\$0	\$51,459	(\$51,459)	\$52,331	(\$52,331)
Year 1	\$20,282	\$9,977	(\$41,154)	\$7,483	(\$39,531)
Year 2	\$19,692	\$9,687	(\$31,149)	\$7,265	(\$27,105)
Year 3	\$19,118	\$9,517	(\$21,547)	\$7,165	(\$15,152)
Year 4	\$18,561	\$9,131	(\$12,117)	\$6,848	(\$3,439)
Year 5	\$18,021	\$8,865	(\$2,961)	\$6,648	\$7,933
Year 6	\$17,496	\$8,709	\$5,826	\$6,557	\$18,871
Year 7	\$16,986	\$8,356	\$14,456	\$6,267	\$29,591
Year 8	\$16,491	\$8,112	\$22,835	\$6,084	\$39,998
Year 9	\$16,011	\$7,970	\$30,876	\$6,001	\$50,008
Year 10	\$15,545	\$7,647	\$38,774	\$5,735	\$59,817



This tool is aimed at assisting users in decision making by providing analysis based on various assumptions and a variety of factors. While an effort has been made to use accurate assumptions and factors in developing this tool, results are based on user provided data and data provided from publicly available sources, and all costs, savings and monetary returns shown in the calculations performed using this tool are estimated results only. ACUITY BRANDS LIGHTING, INC. (ABL) MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS, SAFETY OR APPROPRIATENESS OF ANY DESIGN INCORPORATING ABL MATERIALS, PRODUCTS, USES, RECOMMENDATIONS OR ADVICE. IN NO EVENT SHALL ABL BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF THESE TOOLS.

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