

HALO[®] LED Tool Kit Training

March, 2009

 **COOPER** Lighting

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Purpose

- **Easy way to demonstrate the value of LED to the end user.**
 - Basic operational energy savings
 - Maintenance savings
 - HVAC savings
 - Dimming controls savings
- **Compare traditional sources to HALO LED**
 - R and BR style lamps
 - A-lamps
 - CFL
- **Flexible, easy, and fast**
 - Personalize to specific needs
 - Easy look-ups to typical systems



Easily communicate HALO LED value

Website link

➤ Cooper Ltg Home Page

➔ Solutions dropdown

➔ Energy link

The the initial access to the tool.

The screenshot shows the Cooper Lighting website home page. A red arrow points to the top navigation bar. A green arrow points to the 'Solutions' dropdown menu, which is open and shows 'Energy' as a selected option. Another green arrow points to the 'Energy' link in the dropdown. The main content area features a large banner for 'HALO LED, First with ENERGY STAR' with a 'spotlight on LED' graphic. Below the banner are several smaller promotional tiles for various products and guides. The right sidebar contains a 'Cooper Lighting Brands' section with logos for various brands like AMLITE, CoreLite, HALO, etc.

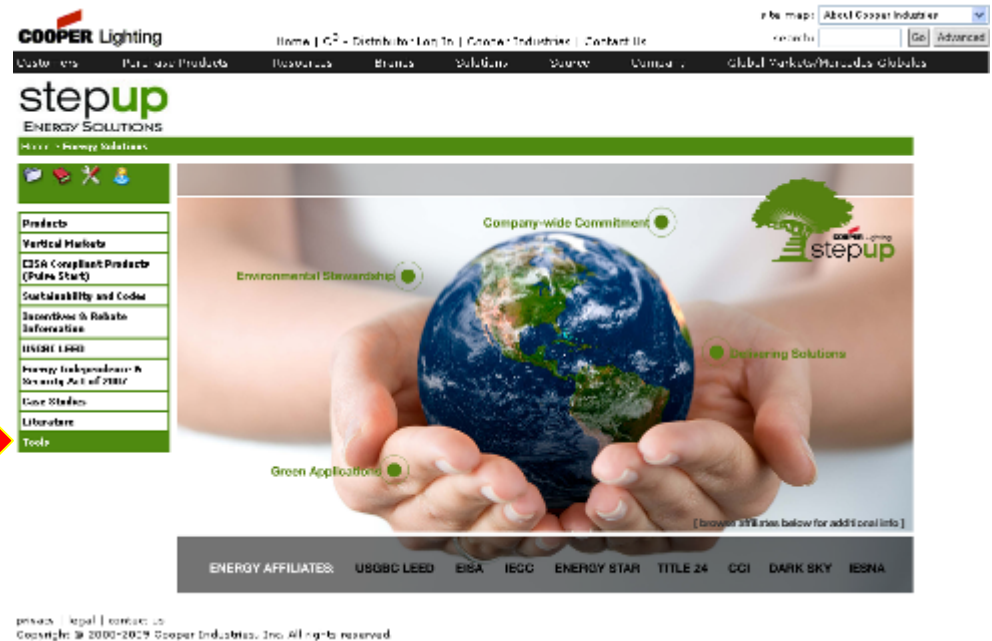
Start from home page

Energy Solutions link

➤ stepup – Energy Solutions

➔ Tools

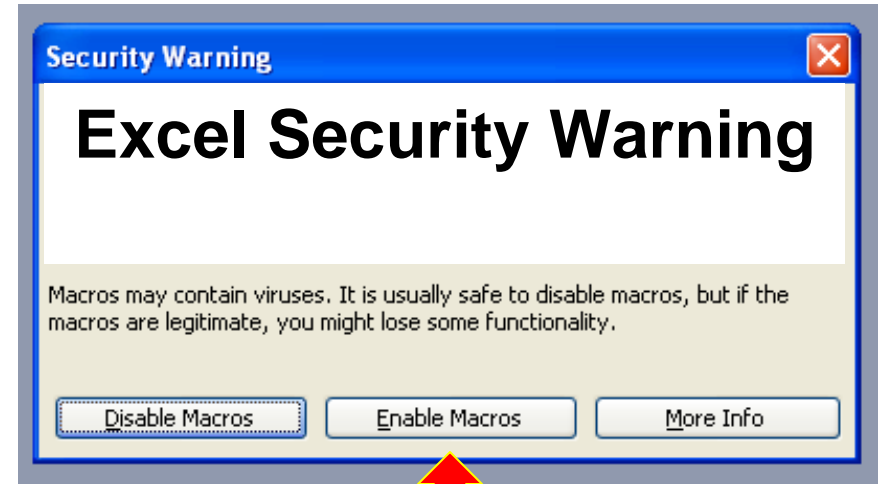
Energy Solutions was found to be a good location. LEDs are understood to save energy by most.



Directs to the Tools page

Open Excel

- Macro warning
- ➔ Click “Enable Macros”



This turns on some calculation routines.



Makes certain calculations faster

Possible Excel Warning

➤ **Security Warning possible**

➔ **Dialog box means Macro Security settings are set too high... Change**

➔ **Changing Macro Security Settings**

➔ **Change to MEDIUM**

The screenshot shows the Microsoft Excel interface with a security warning dialog box at the top. The warning text reads: "Macros are disabled because the security level is set to High and a digitally signed Trusted Certificate is not attached to the macros. To run the macros, change the security level to a lower setting (not recommended), or request the macros be signed by the author using a certificate issued by a Certificate Authority." Below the warning are buttons for "Hide Help <<" and "Open in Help Window".

The Excel window title is "Microsoft Excel - HaloLEDToolkit-V1D.xls". The menu bar includes File, Edit, View, Insert, Format, Tools, Data, Window, Help, and Adobe PDF. The Tools menu is open, showing options like Protection, Macro, and Options. The Macro menu is also open, showing options like Macros..., Record New Macro..., Security..., Visual Basic Editor, and Microsoft Script Editor.

The Security dialog box is open, showing the Security Level set to "Trusted Publishers". The "Medium" radio button is selected, with the following description: "Medium. You can choose whether or not to run potentially unsafe macros." Other options include "Very High", "High", and "Low (not recommended)".

Red arrows point from the text on the left to the warning dialog box. A green arrow points from the text on the left to the Macro menu. A blue arrow points from the text on the left to the Security dialog box. A 3D rendering of a Halo LED light fixture is visible in the background.

Reduces macro settings to MEDIUM level

Tool Kit Home Page

- Three basic sections
 - ➔ Energy & Maintenance does not evaluate lighting performance
 - ➔ Lighting Performance assesses relative luminaire performance using CU values
 - ➔ Energy Costs by State is a hyperlink to the latest EIA (USA Energy Information Administration) data

Microsoft Excel - HaloLEDToolkit-V1B.xls

File Edit View Insert Format Tools Data Window Help Adobe PDF

D26 LATEST ENERGY COSTS BY STATE [cents/kWh]

Insert Logo Here HALO® LED Down Light Toolkit

Our world is increasingly recognizing the importance of environmental sustainability and efficiency in building design. Good business is cost-conscious and environmentally responsible while driving more to the bottom line through increased productivity and a smaller carbon footprint.

The HALO LED Down Light Tool Kit includes calculators to help you make informed decisions when considering sustainable LED down lighting systems.

HOME PAGE

ENERGY & MAINTENANCE TOOLKIT

It is common for specifiers to mock-up a space and visually determine adequate light levels. This utility allows for those instances, and others, where relative light levels are not required.

LIGHTING PERFORMANCE TOOLKIT

This utility is not intended as a substitution for a lighting layout. However, total lumens, number of luminaires, and CU values provide a reasonable method to determine relative lighting levels. Energy and Maintenance costs are calculated as the relative lighting levels are satisfied.

references:

[LATEST ENERGY COSTS BY STATE \[cents/kWh\]](#)

ENERGY STAR® trademark is allowed only for qualified Solid State Lighting products tested and approved to strict US government requirements for energy savings and quality. For further information, click on the ENERGY STAR® logo when it is shown.

HALO® LED specification details can be found on Cooper Lighting's website. For further information, click on the product image when it is shown.

Additional Step Up tools - including an EPAct calculator and Step Up Payback Proposal Program - are available by clicking the Step Up logo.

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[Return to TOP](#)

Hyperlinks to HALO LED tools

Reference Tools

Hyperlink Support



Energy Information Administration (EIA)

➤ Updated frequently

➔ Shows energy costs by state and region

➔ Energy market segment

➔ Can look at a region instead of state

➔ National rate included



Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State

Electric Power Monthly with data for November 2008
Report Released: February 13, 2009
Next Release Date: 180-18March 2009

Table 5.6.A. xls format Electric Power Monthly

Census Division and State	Residential ¹		Commercial ¹		Industrial ¹		Transportation ⁽¹⁾		All Sectors	
	Nov. 08	Nov. 07	Nov. 08	Nov. 07	Nov. 08	Nov. 07	Nov. 08	Nov. 07	Nov. 08	Nov. 07
New England	17.99	16.41	15.44	14.26	13.53	12.03	8.99	9.03	16.02	14.75
Connecticut	18.17	18.70	18.35	14.73	14.3	13.26	11.38	12.02	17.37	15.99
Maine	14.81	14.83	13.31	13.09	12.05	--	--	--	14.99	13.64
Massachusetts	14.85	16.95	13.08	15.42	11.86	--	--	--	17.67	13.47
New Hampshire	14.37	12.86	12.4	9.05	8.92	--	--	--	12.39	12.15
Rhode Island	13.82	13.03	12.88	8.23	7.6	11.32	8.73	12.47	11.94	11.94
Vermont	13.51	13.44	12.34	12.38	10.33	13.98	11.46	14.04	14.24	14.24
Middle Atlantic	16.94	15.05	15.48	9.6	8.21	12.25	9.12	14.99	14.71	14.71
New Jersey	11.08	9.43	9.26	7.01	6.72	7.07	6.7	9.31	8.98	8.98
New York	10.94	9.95	8.95	8.52	6.6	5.85	9	6.74	8.78	7.94
Pennsylvania	12.15	10.58	8.54	8.46	7.78	8.65	8.72	6.25	9.55	8.56
East North Central	8.47	8.03	8.24	7.5	5.88	4.97	10.54	10.55	7.58	6.65
Illinois	10.81	10	9.26	8.79	6.81	6.23	10.34	11.75	8.96	8.3
Indiana	10.21	9.6	9.43	8.77	6.47	5.73	11.33	10.88	8.57	7.79
Michigan	11.69	10.95	9.43	8.75	6.72	6.03	--	--	9.19	8.38
Ohio	8.56	8.07	6.84	6.4	5.11	4.74	6.23	6.83	6.87	6.39
Wisconsin	9.34	9.25	8.77	6.05	4.58	4.42	NM	--	8.47	6.20
West North Central	8.67	7.87	7.15	6.54	5.62	4.96	--	--	7.10	6.4
Iowa	9.92	9.09	7.83	7.11	5.81	5.31	7.83	8.64	7.77	7.06
Kansas	7.77	7.37	6.15	5.72	4.79	4.33	4.61	4.99	6.46	5.99
Minnesota	7.57	7.27	6.32	6.02	4.69	4.33	--	--	6.15	5.79
Missouri	7.5	7.28	6.86	6.76	5.27	5.24	--	--	6.87	6.5
Nebraska	8.21	8.2	6.75	6.71	5.24	5	--	--	7.02	6.9
North Dakota	10.85	10.12	9.49	8.71	6.92	5.7	11.82	9.71	9.44	8.63
South Dakota	14.57	13.88	11.97	11.34	9.4	9.33	--	--	12.11	11.46
South Atlantic	13	11.6	13.14	12.03	9.91	9.02	17.62	11.51	13.17	11.74
Delaware	11.98	10.53	9.86	8.85	7.87	10.66	9.79	11.05	10.4	10.4
District of Columbia	9.81	9.08	7.84	6.62	5.22	6.73	6.6	6.65	7.41	7.41
Florida	13.84	12.25	11.31	9.35	9.69	11.22	10.8	12.52	11.86	11.86
Georgia	9.78	7.5	7.48	5.98	5.46	6.88	2.03	7.94	7.77	7.77
North Carolina										



Scroll down

Useful data for customer to know and use

Other reference tools

- **Hyperlinks to websites for the latest information**
- ➔ **Solid State Lighting ENERGY STAR® program details**
- ➔ **HALO LED latest updates**
- ➔ **Cooper Lighting stepup program's latest updates**



Hyperlinks to references

Energy & Maintenance

Manual and Automatic

 **COOPER** Lighting

Energy & Maintenance - Home

- **Hyperlinks help...**
- ➔ **Manual data entry (Useful if there are specifics not found in the automatic version)**
- ➔ **Automated using typical down light comparisons**
- ➔ **Allows for quick movements within the Excel workbook**
- ➔ **Note box to help user identify key worksheets**

Insert Logo Here

HALO® LED Down Light Energy and Lamp Maintenance Tool Kit

stepup Energy Solutions

Return HOME
Return to LIGHTING PERFORMANCE TOOLKIT

SustainabLEDDesign™

Our world is increasingly recognizing the importance of environmental sustainability and efficiency in building design. Good business is cost-conscious and environmentally responsible while driving more to the bottom line through increased productivity and a smaller carbon footprint.

The HALO LED Down Light Tool Kit includes calculators to help you make informed decisions when considering sustainable LED down lighting systems.

Definitions

Retrofit - This allows for the HALO LED Module and trim comparison calculations made against traditionally lamped trims in a 1-1 replacement installation.

Remodel - This allows for the HALO LED dedicated housing, LED module, and trim comparison calculations made against traditionally lamped trims in a 1-1 and 1-many configuration. (The location of the down lights are typically moved.)

Comparative - This allows for comparison calculations made between traditionally sourced down light trims compared to HALO LED in 1-1 and 1-many comparisons.

Manual Input - HALO LED Analysis Tools

Without Lighting Controls

- [Retrofit Analysis](#)
- [Retrofit Analysis with HVAC](#)
- [Remodel Analysis](#)
- [Remodel Analysis with HVAC](#)
- [Comparative Analysis](#)
- [Comparative Analysis with HVAC](#)

With Lighting Controls

- [Retrofit Analysis](#)
- [Retrofit Analysis with HVAC](#)
- [Remodel Analysis](#)
- [Remodel Analysis with HVAC](#)
- [Comparative Analysis](#)
- [Comparative Analysis with HVAC](#)

Automated Input - HALO LED Analysis Tools

Without Lighting Controls

- [Retrofit Analysis](#)
- [Retrofit Analysis with HVAC](#)
- [Remodel Analysis](#)
- [Remodel Analysis with HVAC](#)
- [Comparative Analysis](#)
- [Comparative Analysis with HVAC](#)

With Lighting Controls

- [Retrofit Analysis](#)
- [Retrofit Analysis with HVAC](#)
- [Remodel Analysis](#)
- [Remodel Analysis with HVAC](#)
- [Comparative Analysis](#)
- [demo Comparative Analysis with HVAC](#)

Manual Input Analysis allows the user to enter specific system information. There are many lamps and ballasts. This tool allows for flexibility customers may require here specific needs.

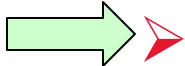
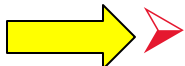
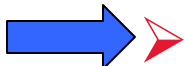
Automated Analysis Tools compares the HALO LED to typical systems found in down lighting applications.

Return to TOP

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Hyperlinks to HALO LED tools

Data entry and calculations

-  **Light green inputs**
 - Comments provided to assist data entry
-  **Yellow calculated / fixed**
 - Comments provided to understand results
 - Fixed cells reduce entries
-  **Project name and contact are manual entries as well**

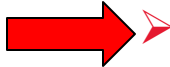
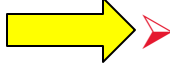
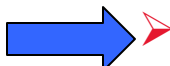
stepup
ENERGY SOLUTIONS

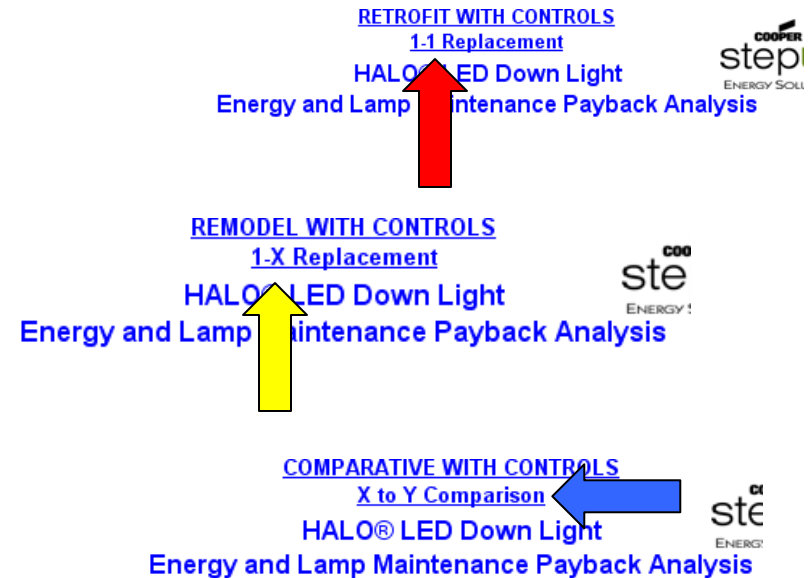
HALO® LED Down Light
Energy and Lamp Maintenance Payback Analysis
HVAC Savings Included Rev. 1

Customer Information		Facility Information	
Project Name:	<input type="text"/>	Area (sq. ft.)	<input type="text" value="0.103"/>
Contact:	<input type="text"/>	Cost Per kWh \$	<input type="text" value="0.103"/>
		Annual Operating Hrs	<input type="text"/>
System Information		Existing	HALO LED
 Down Light Luminaire System Description 	Input Watts Per Luminaire	<input type="text" value="manual entry"/>	HALO LED ML706830 Series
	Quantity	<input type="text"/>	<input type="text" value="14.8"/>
	Per Luminaire Cost	\$ <input type="text" value="-"/>	\$ <input type="text" value="-"/>
	Total System Cost	\$ <input type="text" value="-"/>	\$ <input type="text" value="-"/>

Know what inputs are required

Energy & Maintenance - Models

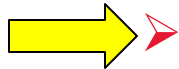
-  **Retrofit**
 - Replacement of existing down light 1 to 1
 - Spreadsheet does calculation
-  **Remodel**
 - Replacement of existing down light 1 to some number greater or less than the existing installation
 - Must enter the number for both systems
-  **Comparison**
 - Compare down light systems
 - Can review purchase costs, installation, and rebates side-by-side



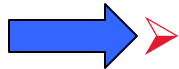
Flexibility to review different type of installations

Energy & Maintenance - Features

- **Basic system**
 - Simple analysis
 - Does not have HVAC and Dimming Controls



- **HVAC calculations**
 - Includes standard ASHRAE calculated savings due to reduced energy



- **Dimming Controls**
 - Includes the energy savings due to dimming
 - Maintenance savings are not included at this time

Dimming Controls	Quantity w/Lighting Controls	50	30
	% Annual Operating Hours Controlled	0%	50%
	% Light Output Controlled	0%	60%
	Effective System Watts - w/Control	1,000	311
	Effective Systems kW - w/Control	1.00	0.31
	Annual kWh	4,370	1,358
	Annual Energy Costs	\$ 451	\$ 140
	Monthly Costs	\$ 38	\$ 12
	<u>Cooling Energy Assessment</u>		
	State, City Selection	Arizona, Phoenix	
	ASHRAE Cooling Factor	0.35	
	Operating Months	10	
	Annual HVAC Energy Consumed	\$ 11	\$ 3
	Total Annual Energy Consumed	\$ 461	\$ 143
	Per Lamp Replacement Cost	\$ 0.50	\$ 75.00
	Per Lamp Replacement Labor Cost	\$ 3.00	\$ 3.00
	Rated Lamp Life (hours)	10,000	50,000
	amps Replaced Annually (Group & Spot Relamp)	29	-
	Annual Lamp Maintenance Cost	\$ 102	\$ -
	<i>Estimated Usable Life(L70) HALO LED Module - Years</i>		11.4

Evaluate the impact of “enablers” such as geography and controls

Energy & Maintenance – Summary

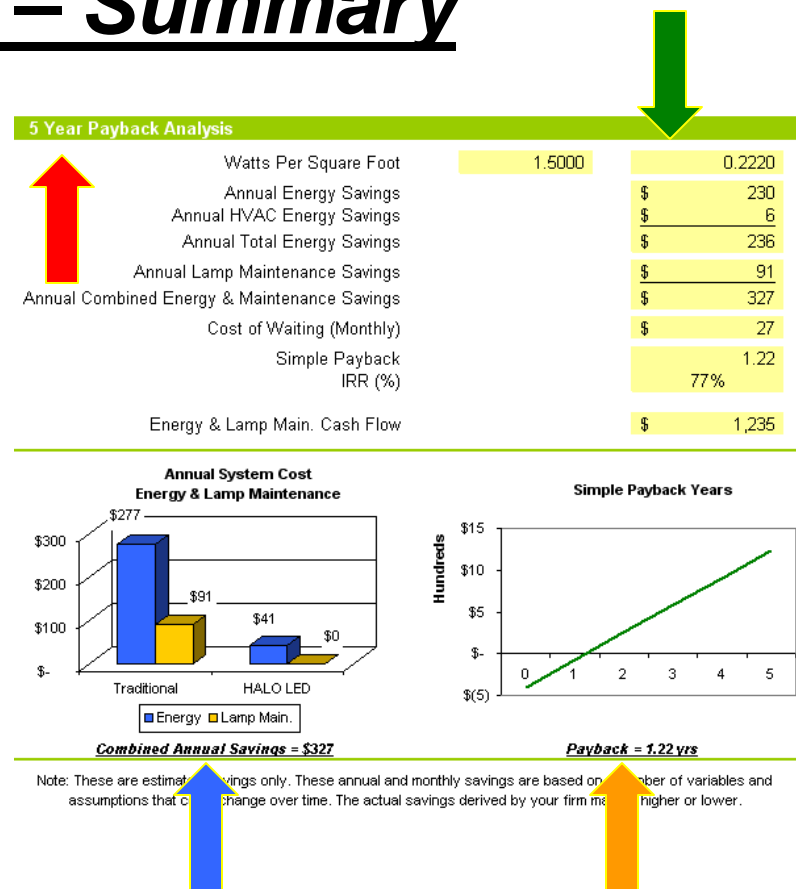
➤ Financial summary

➔ Based upon 5 years

➔ Resulting data

➔ Breakout of expenses

➔ Payback profile



Resultant customer value

Lighting Performance

Review relative light levels

 **COOPER** Lighting

Relative Lighting Performance - Home

➤ **Hyperlinks help...**

➔ **By lamp type & typical trims**

➔ **By trim type & typical lamps**

➔ **Allows for quick movements within the Excel workbook**

➔ **Note box to help user identify key worksheets**

The screenshot shows the 'HALO® LED Down Light' tool interface. At the top, it says 'Compare HALO's LED vs. Traditional Systems' and 'stepup ENERGY SOLUTIONS'. Below this, there are two main sections: 'Compare Physical Systems By Lamp Type' and 'Compare Physical Systems By Trim Type'. Each section contains a list of system types with checkboxes and a 'demo' link. For example, under 'By Lamp Type', there are sections for 'RBR/PAR Lamped Systems', 'A Lamped Systems', and 'CFL Lamped Systems'. Under 'By Trim Type', there are sections for 'Open White Baffle', 'Open Specular/Semi-Diffused Reflector', 'Lensed Trim (Flat Lens)', 'Lensed White Baffle', 'Domed Shower Trim', 'Drop Lensed Trim', and 'Fresnel Lensed Trim'. A note box at the bottom left contains the text: 'Additional spreadsheets including an RPA tool kit and a Project Budget & Proposal Form are available by clicking the Excel Logo'. Navigation arrows point to various elements: a red arrow points to the 'demo' link for 'Open White Baffle' in the 'By Lamp Type' section; a green arrow points to the 'demo' link for 'CFL Lamped Systems' in the 'By Trim Type' section; a blue arrow points to the 'Return HOME' link at the top right; a blue arrow points to the 'Return to TOP' link at the bottom left; and a green arrow points to the 'Excel Logo' at the bottom right.

Hyperlinks to HALO LED tools

Relative Lighting Performance - Inputs

- Relative lighting performance...
 - ➔ By trim & Lamp
 - Automated calculation methods
 - ➔ 1-1
 - ➔ Relatively same light levels
 - ➔ Includes HVAC
 - ➔ Includes Dimming Controls
 - ➔ Compares to 3 most common HALO LED trims

COMPARATIVE HALO® LED Performance Comparator
Traditional Systems: R/BR/PAR Lamps with White Baffle Trim

Customer Information: Project Name: demo provided - can be modified; Contact: _____; Facility Information: Area (sq. ft.): 400; Annual Operating Hours: 370

System Information	Traditional	HALO LED(T)	HALO LED(C)	HALO LED(S)
Down Light Luminaire System Description	INC 85W BR30	ML706830	ML706830	ML706830
Typical Trim Selection	Open White Baffle/Reflector - R/BR/PAR	494SC06 Specular Reflector	494WB06 White Baffle Trim	493WBS06 White Baffled Lensed Trim
Input Watts Per Luminaire	85	14.8	14.8	14.8
Quantity	100	81	95	94
Lumens	35	655	609	592
Relative Performance Indicators @ CR = 4				
Estimated Average Light Levels (% Better / Worse)		0%	1%	0%
Operation Energy Assessment				
Quantity w/Lighting Controls	0	0	0	0
% Annual Operating Hours Controlled	0%	0%	0%	0%
% Light Output Controlled	0%	0%	0%	0%
System Watts	8,500	1,199	1,406	1,391
System kW	8.5	1.20	1.41	1.39
Annual kWh	37,145	5,239	6,144	6,080
Annual Energy Costs	\$ 5,483	\$ 773	\$ 907	\$ 897
Monthly Costs	\$ 457	\$ 64	\$ 76	\$ 75
Cooling Energy Assessment				
State, City Selection	California, Sacramento			
ASHRAE Cooling Factor	0.35			
Operating Months	7			
Annual HVAC Energy Consumed	\$ 92	\$ 13	\$ 15	\$ 15
Total Annual Energy Consumed	\$ 5,574	\$ 786	\$ 922	\$ 912
Lamp Maintenance Assessment				
Per Lamp Replacement Cost	\$ 5.00	\$ 3.00	\$ 60.00	\$ 60.00
Per Lamp Replacement Labor Cost	\$ 3.00	\$ 3.00	\$ 3.00	\$ 3.00

Quick Path: [Return to HOV](#), [Return to E](#), [Return to LI](#), [Go to BOT](#)

Click... Match Quantity
Click... Match Lighting Performance

Answers the question of relative light levels

Relative Lighting Performance – Summary

➤ **Relative lighting performance produces a financial report...**

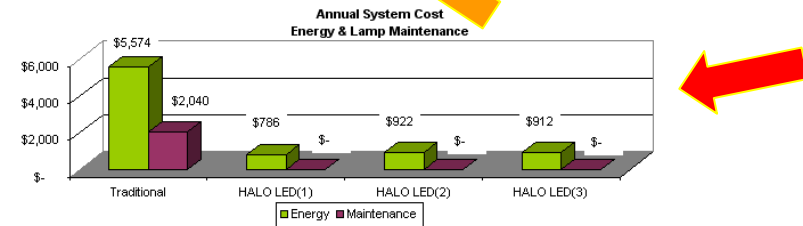
➔ **5 year results**

➔ **Select Cost of Capital**

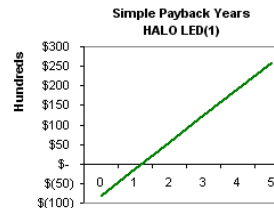
➔ **Energy & Maintenance comparisons**

➔ **Payback comparison**

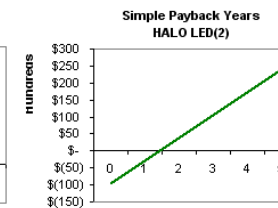
5 Year Payback Analysis				
Watts Per Square Foot	21,2500	2,9970	3,5150	3,4780
Annual Energy Savings	\$ 4,788	\$ 4,652	\$ 4,662	\$ 4,662
Annual Lamp Maintenance Savings	\$ 2,040	\$ 2,040	\$ 2,040	\$ 2,040
Annual Combined Energy & Maintenance Savings	\$ 6,828	\$ 6,692	\$ 6,702	\$ 6,702
Cost of Waiting (Monthly)	\$ 569	\$ 558	\$ 559	\$ 559
Simple Payback	1.1	1.4	1.5	1.5
IRR (%)	80%	65%	58%	58%
Energy & Lamp Main. Cash Flow	\$ 26,029	\$ 23,950	\$ 23,158	\$ 23,158
Cost of Capital (%)	10%			
Net Present Value - Five Year Evaluation	\$ 16,157	\$ 14,416	\$ 13,685	\$ 13,685



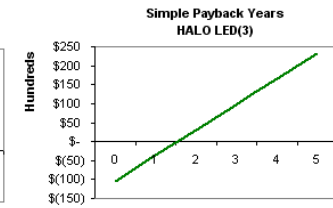
Combined Annual Savings = HALO LED(1) \$6,828; HALO LED(2) \$6,692; HALO LED(3) \$6,702



Payback = HALO LED(1) 1.1yrs ;



HALO LED(2) 1.4yrs ;



HALO LED(3) 1.5yrs

Formatted to show “true” customer value

Conclusion

- **Tool provides...**
 - Links to reference data
 - Compares systems for...
 - Energy
 - Maintenance
 - Relative lighting performance



Another reason why HALO is the...
#1 Brand Leader