



## Q&A Session for Cold Storage, Cool Lights & Cold Hard Cash

**Q: Was the case study/Maines project a one-for-one replacement?**

A: Yes.

**Q: What was the cost of the installation for the Maines project?**

A: That information was not disclosed. But with the lighting energy savings of 87% and an attractive project incentive, the project had a payback of less than one year, including the installation costs.

**Q: How is TCO different to TCR?**

A: They are two different ways of looking at the same thing. TCO – total cost of ownership – looks at all of the costs associated with a given project over a given period of time. TCR – total cash remaining – takes the exercise a step further and deducts the annual TCO amount each successive year and shows your declining bank balance. A better TCO project will have a better ‘total cash remaining’ picture at the end of the given period of time.

**Q: Zero maintenance costs imply that over the 6 year life of the lamps, there will not be any cleaning of the lamps - how do you account for dirt depreciation?**

A: Good question. Cleaning was not one of the maintenance expenses factored in any of the alternatives. Re-lamping and ballast replacements were the costs. Cleaning would be separate and – presumably equal – across the options.

**Q: There was a very large difference in the energy costs in the HID vs LED comparison, could you briefly explain the workings of that?**

A: Absolutely. The differences in energy costs between HID and Intelligent LEDs are driven by the following factors – power and occupancy. Regarding power, the HID draws 465 Watts of power vs. the Intelligent LEDs, which draw 160 Watts at full brightness. Regarding occupancy, the HIDs are left on all the time and the Intelligent LEDs are only on as needed (when an operator is in the area). Given how quickly operators move and how closely tuned the sensors are to movement, the Intelligent LEDs are only on a fraction of the time that the HIDs are. So, the Intelligent LEDs run at about 1/3 the power and are only on for a fraction of the time so the resulting energy costs are drastically different. The slide on page 39 of the presentation, “Sensor Delay & Energy Cost” addresses this issue, as well, but with respect to HIFs. HID is directly analogous, but with an even greater delta on the power required.

**Q: Is this TCR analysis for cold storage applications, or for ambient?**

A: The TCR analysis was a cold storage facility, although it did not take into account any refrigeration savings. The analysis would be similar for ambient.

**Q: Many HID or HIF fixtures have covers in freezer/cooler applications. Are these required with the LED fixture?**

A. The Digital Lumens Intelligent Light Engines do not have any glass in them and do not require covers in freezer/cooler applications.

**Q: I came in a little late, but I am wondering about the economics of replacing a current fluorescent system. How long would it take to recoup the cost of a changeover for a 10,000 square foot facility?**

A. The payback period will definitely be longer than if you were going straight from HID to Intelligent LEDs, but the timeframe varies according to the following variables – what types of HIF, whether they're on dimmers and/or sensors, the number of shifts in the facility you're your kWh rate. The Lighting Energy Savings calculator on our site can take that information from you and chart the answer.

**Q: is there any freeware for computing the energy savings according to a certain input?**

A. There is a Lighting Energy Savings calculator on the Digital Lumens web site at [www.digitallumens.com/savings-calculator](http://www.digitallumens.com/savings-calculator) that will allow you to provide your data and get an estimate of the savings.

**Q: Are there any ongoing costs after the fact?**

A. No. The costs of the system are up front and with 50,000 hours of ontime and a 5-year system warranty, there are no maintenance or re-lamping expenses to manage. Per the question above, cleaning (if necessary) is not factored into the economics presented.

**Q: Can you recommend a software for LED light design?**

A. If you are asking about software for lighting layout, our team uses Visual.

**Q: When most incentive programs are based on ROI, how does a contractor appeal to the annual (and beyond) savings when qualifying a client for incentives?**

A. In our experience, most utility incentive programs are based on kWh reduction and removing load from the grid. What's important there is to ensure that the projected savings are measurable and verifiable. Also important when pursuing incentives is make sure to engage with the utility program manager at the front end of the product and understand their requirements. Many programs now require that products eligible for incentives be listed on the Design Lights Consortium's Qualified Products List, which can be found on their site at [www.designlights.org](http://www.designlights.org).

**Q: What are the warranties again?**

A. 5 years.

**Q: Is this presentation and the cost calculator on your website?**

A. The recorded version of the presentation will be on the web site. The questions and slides are made available to the Webex attendees.

**Q: What is the clear height of the warehouse and and at what height off the finished floor are you obtaining 20 foot candles light level?**

A. This facility has 40-foot ceiling heights. The 20fc reading was taken at hip height.

**Q: On your TCR calculations, did you use vendor costs, or installed costs ( vendor, profits, etc. )**

A. Installed costs.

**Q: On the 465W HID case you discussed, was the Digital Lumens product a 1-for-1 replacement?**

A. Yes. That is very typical in retrofits. We also have installations where the Digital Lumens product is slightly better than 1-for-1.

**Q: Where are the lights & parts made?**

A. The Digital Lumens system is designed in the United States and assembled in Asia.

**Q: You have talked about light life of about 50,000 hrs is that the LED bulb or the driver life?**

A. That is the luminaire's rated lifetime before significant lumen depreciation begins, including LED packages and driver.

**Q: You used \$0.10 per kwh. Our cost is as low as \$0.03. How can you make the TCR better based on this rate?**

A. \$0.03 kWh rate is unusually low and you may not be motivated to modify your lighting based on kWh rate alone. However, other factors such as maintenance, light quality and/or corporate sustainability objectives might be higher priorities. Also, utility rates are subject to increases down the road, so future-proofing your energy bill is certainly a consideration.

**Q: Is the LED life expectancy as good in ambient temp as it is in cold?**

A. 50,000-hours is the time before significant lumen depreciation, not lifetime expectancy. That measurement is done at ambient temperature, and it will be longer in cold environments.

**Q: How much does the fixed set up cost (per facility) matter? In other words, how big should the facility be to be economically worthwhile?**

A. The savings are simply percentage reduction over your previous lighting costs. So, if your potential savings are 80-90% over your current lighting, your savings are 80-90%. In general, the factors driving the project costs are size of facility, desired light levels, number of shifts per day, number of days per week the facility operates, and occupancy patterns.

If your facility is currently running multiple shifts and has HID lights, chances are that there are savings available and that they're scaled to facility size.

**Q: Do the fixtures have a lens that could shatter? Fixtures used over exposed food product must be shatter-proof or have a cover.**

A. The lenses are plastic and are shatterproof.

**Q: The early example of \$611 annual energy cost HID vs \$ 52 annual energy cost LED = \$559 annual savings. < 1yr payback stated. Implies installed cost less than \$559?**

A. This was from the Maines case study, a project which included an incentive from NYSERDA.

**Q: What is your oldest installation?**

A. Our initial installations were deployed early in the development and testing process and continue to operate at full efficacy almost two years later (so far).

**Q: Is there an on going cost for the use of the (LightRules) controls software? Or is that included in the price of the fixtures? -**

A. LightRules is currently included in the price of the Intelligent Lighting System.

**Q: More information on training for sensors programming?**

A. Our Application Engineering team provides a full suite of training materials for our value-added resellers and customers.

**Q: Lighting cost you have presented -- is it for the lighting or for the total upgrade of the system? I'm sure the entire light system will have to be rewired for a new power source.**

A. The costs outlined are total project costs. In a retrofit situation, the Digital Lumens Intelligent Light Engines (luminaires) typically go in as a one-for-one retrofit using the existing wiring.

**Q: Does the EPCRA 2005 tax credit figure prominently in many of the Digital Lumens installations to date?**

A. The installations we highlighted in the webcast included utility-based incentives. EPCRA credits were not factored in those business cases. Worth noting: there are consulting teams that work with our customers to ensure that they receive the maximum tax benefit for their energy-efficiency installations.

**Q: Are there any existing standards & are they going to push to use LED?**

A. The most relevant standard is the Design Lights Consortium's Qualified Products List (QPL), which lists products that meet the group's stringent criteria for highbay and other industrial lighting. The DesignLights Consortium ([www.designlights.org](http://www.designlights.org)) is a group of 20+ utilities that has a lighting working group that picks up where the Energy Star program leaves off and designates products that meet exacting criteria for quality and performance. Listing on the QPL is often a requirement for receiving project incentives or rebates.

**Q: In the beginning of your presentation I thought I saw a 1-year pay back then later it was 2.19-year pay back?**

A. Good question. The Maines case study featured a payback of less than 1 year, and had a rebate provided by NYSERDA. The later TCR example had a 2.19-year payback **without** any utility rebate/incentive.

**Q: How significant are the savings due to the low operating temperature of LED?**

A. They can be very significant. The back-of-the-envelope calculations are that the thermal load reductions typically amount to 30% of the lighting energy savings. In an existing facility, this is a significant reduction in chiller burden. In a new-build situation, it can mean reducing the system requirements for the new facility. Note that this chiller load reduction is not factored into any of the paybacks cited in this presentation. They would improve these payback calculations.

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