



Energy-efficiency projects can not only reduce energy bills but also offer non-energy benefits (NEBs). Sometimes the energy savings alone can justify the project, but while NEBs may be hard to quantify, they could help **tip the scales** in getting the OK for an energy-efficiency project.

Even the roughest estimate of NEBs is bound to be more accurate than crediting them with no value at all. And remember, your calculations involve other estimated values as well, including future fuel costs, discount rates, and energy savings.

## NEBs can add weight to a cost analysis

### NEBs + energy cost savings

Improved indoor & outdoor environment; better business parameters

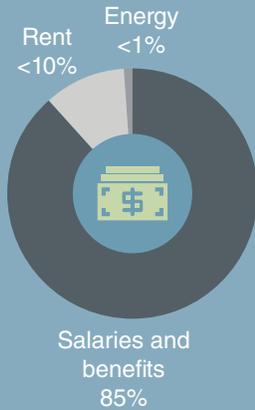
### Energy cost savings

Lower energy bills & lower demand charge



## Where does it all go?

### Workplace costs



Category	Percentage
Salaries and benefits	85%
Rent	<10%
Energy	<1%

In the typical office, it costs at least 85 times as much to pay the workers as it does to pay the energy bill. Boosting productivity by less than 1 percent can be worth as much as cutting the energy bill in half.

## Research shows ...

- Daylighting can reduce absenteeism, increase sales, and create a better learning environment. One study found that workers with more exposure to sunlight at the office had slept longer and had better sleep quality and overall health.<sup>1</sup>


- Tunable LEDs that vary color temperature can affect a person's mood, learning, productivity, and circadian rhythms. They've been shown to improve student performance.<sup>2,3</sup>


- LEDs emit little infrared, which can lead to longer shelf life of perishable foods.


- Deep energy retrofits produce many benefits. At the Universal Studios—Los Angeles Hilton hotel, LED lighting and controls, new HVAC fan motors in guest rooms, new chillers, and dynamic tinting glass led to increased net operating income and property value.<sup>4</sup>



## Possible NEBs

- ### Improved indoor & outdoor environment

-  more comfortable temperatures indoors
  -  quieter surroundings
  -  better lighting

-  improved air quality and health
  -  less air pollution
  -  less light pollution
- ### Improved business parameters

  -  increased productivity and sales
  -  better preservation of goods and materials
  -  reductions in construction costs and waste
- ### Improved property parameters

  -  reduced insurance costs
  -  increased rents and occupancy
  -  tenant retention

## Estimating NEB savings

- 1 Find other estimates or studies** with circumstances similar to yours.
- 2 Look at the cascading effects**—if higher morale may result from improved factory lighting, that might lead to lower turnover, less absenteeism, and faster learning. The benefit could then be quantified in terms of reduced costs for recruiting and training.
- 3 Work backward from a chosen financial parameter**, such as internal rate of return (IRR). Take the estimates for the tangible benefits and solve for the value of the NEBs required to yield the desired IRR. If it takes \$10,000 worth of intangibles for a project to achieve the desired IRR, and the benefit is higher morale, a decision-maker may conclude that an increase in morale will easily save \$10,000, or that it won't.

<sup>1</sup>Northwestern University, "Natural Light in the Office Boosts Health" (August 2014), [www.northwestern.edu/newscenter/stories/2014/08/natural-light-in-the-office-boosts-health.html](http://www.northwestern.edu/newscenter/stories/2014/08/natural-light-in-the-office-boosts-health.html).  
<sup>2</sup>Tim Whitaker, "Optimized Lighting Conditions Help Students Improve Performance" (June 2012), *LEDs Magazine*. [www.ledsmagazine.com/articles/2012/06/optimized-lighting-conditions-help-students-improve-performance.html](http://www.ledsmagazine.com/articles/2012/06/optimized-lighting-conditions-help-students-improve-performance.html).  
<sup>3</sup>"LEDs Help Students Concentrate More and Perform Better" *BizLED Magazine* (May 2015), <http://bizled.co.in/leds-help-students-concentrate-more-and-perform-better>.  
<sup>4</sup>Rocky Mountain Institute, "Report Release: An Investor's Guide to Calculating and Presenting Deep Retrofit Value" (April 2015), [http://blog.rmi.org/blog\\_2015\\_04\\_28\\_report\\_release\\_an\\_investors\\_guide\\_to\\_calculating\\_and\\_presenting\\_deep\\_retrofit\\_value](http://blog.rmi.org/blog_2015_04_28_report_release_an_investors_guide_to_calculating_and_presenting_deep_retrofit_value).