

# FINANCIAL STRATEGIES



*Lighting upgrade projects are unique from most other business investments in that they provide an immediate and predictable positive cash flow resulting from lower energy bills. This capability allows them to be financed with both familiar and unconventional financing products.*

This document discusses these payment and financing options, and suggests evaluation criteria to help you select the option that is right for your organization. While the right financing option will depend upon your debt capacity, in-house expertise, and risk tolerance, there are viable options for virtually any type of organization.

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## PAYMENT & FINANCING OPTIONS

The payment and financing options discussed below include the following:

- Purchasing equipment & services
  - Cash
  - Loan
  - Utility Incentives
  - State Assistance
- Leasing
  - Capital Lease
  - Operating Lease
- Performance Contracting

Generally, relatively inexpensive, simple efficiency measures that are likely to pay for themselves in about a year are purchased with cash. Large complex projects are often funded differently.

## Purchasing Equipment and Services

### Cash

A cash purchase is the simplest method for financing lighting improvements. A cash purchase makes sense if your organization has cash reserves and a strong balance sheet. The advantage of a cash purchase is that all cost savings realized from the upgrade are immediately available to your organization. Additionally, the depreciation of the equipment becomes a tax deduction. The disadvantage of a cash purchase is the loss of opportunities associated with not having that capital available for other investments.

<b>Cash Purchase</b>	
Balance sheet:	on balance sheet
Initial payment:	100%
Payments:	none
Ownership:	building owner
Tax deductions:	depreciation
Performance risk:	owner

### Loan

Lenders may require up to a 40 percent down payment on loans for energy projects. Generally, a high risk loan will have less leverage (ratio of debt to equity for the project), a higher interest rate, and a shorter term of debt. As a borrower, you may put up business or personal assets as security for the loan. Your borrowing ability will depend on your organization's current debt load and credit worthiness. Loan payments can be structured to be slightly lower than projected energy savings. In this financing situation, you bear all the risks of the project and receive all the benefits.

<b>Loan</b>	
Balance sheet:	on balance sheet
Initial payment:	down payment
Payments:	fixed
Ownership:	building owner
Tax deductions:	depreciation
Performance risk:	owner

**Utility Incentives**

Electric utility deregulation, or restructuring, is proceeding state-by-state at different rates across the country. As a result, the number of available utility incentive, or demand-side-management, programs are decreasing. However, some electric utilities still offer rebates and other incentives to their customers that reduce the initial cost of lighting upgrades. By encouraging their customers to reduce their peak demand for electricity through energy savings, utilities can meet new customer demands at a lower cost than building new power plants.

Before you begin your lighting upgrades, contact your local utility and obtain specific incentive program information. Pay particular attention to customer eligibility criteria and qualifying technologies. Also, verify the *deadline* for the rebate application or upgrade completion to qualify for the financial incentives.

Utility incentives can take several forms.

- ◆ rebates
- ◆ direct utility assistance
- ◆ low interest loans

**Rebates**

- The utility company reimburses the building owner for part of the cost of carrying out lighting efficiency improvements.
- Rebates may be based on load reduction (\$ per kW), or based on a fixed rebate for each energy-efficient product purchased (\$ per item).
- A given technology may qualify under one or more programs offered by the utility. Typically, you can only submit one incentive program application per building. Check with your utility representative for details.
- Rebates have been the most common form of utility incentives during the last several years.

**Direct Utility Assistance**

- The utility pays some or all of the lighting improvement cost directly to an installing contractor *selected by the customer*.
- Alternately, the utility provides lighting upgrade products or services to the customer *through utility personnel or contractors selected by the utility*.

**Low Interest Loans**

- Some utilities offer low-interest financing for energy conservation projects. Loan payments may be added to your utility bills.

**State Assistance**

Some states offer financial assistance to nonprofit or small businesses for operating improvement upgrades. Contact your state energy office to find opportunities. Funding may be available through the State Energy Programs, energy conservation programs supported by the U.S. Department of Energy.

**Leasing**

You may procure your lighting upgrade through leasing to spread out the term of payments. Lease payments are usually lower than loan payments. Laws and regulations for equipment leasing are complex and change frequently so be sure to consult your financial executive, attorney, or auditor before entering into a lease agreement.

**Capital Lease**

Capital leases are installment purchases of equipment. Little or no initial capital outlay is required up front. With a capital lease, you own the equipment and may take deductions for depreciation and for the interest portion of payments. A capital asset and associated liability will be recorded on your organization's balance sheet.

<b>Capital Lease</b>	
Balance sheet:	on balance sheet
Initial payment:	none
Payments:	fixed
Ownership:	building owner
Tax deductions:	depreciation
Performance risk:	owner

## EXHIBIT 1 Summary of Options

Evaluation Factor	Cash Purchase	Loan	Capital Lease	Operating Lease	Performance Contract
Balance sheet	on	on	on	off	off
Initial payment	100%	down payment	none	none	none
Payments	none	fixed	fixed	fixed	variable or fixed
Ownership	building owner	building owner	building owner	lessor	contractor
Tax deductions	depreciation	depreciation, interest	depreciation	lessor	contractor
Performance risk	building owner	building owner	building owner	lessor	contractor

Based on the criteria defined by the Financial Accounting Standards Board (FASB) Statement No. 13, a lease meeting one or more of the following criteria qualifies as a *capital lease*:

- The lease transfers ownership of property to customer at end of lease term
- The lease contains a bargain purchase option
- The lease term covers 75 percent or more of the estimated economic life of the equipment
- The value of the lease equals or exceeds 90 percent of the fair market value of the equipment at the beginning of the lease.

If you work for a governmental organization, you may be eligible for a tax-exempt capital (or municipal) lease. Because the lessor does not pay taxes on the interest from these leases, the rates are lower than typical market rates. For municipal organizations that can undertake new debt, tax-exempt capital leases can be very attractive.

### **Operating Lease**

Under an operating lease the lessor owns the equipment. It is, in effect, "rented" (leased) to your organization for a fixed monthly fee during the contract period. The lessor claims any tax benefits associated with the depreciation of the equipment. At the end of the contract term, you can purchase the equipment at fair market value (or at a predetermined amount); renegotiate the lease; or have the equipment removed.

To meet the FASB definition of an *operating lease*, the lease term must be less than 75 percent of the equipment's economic life and the total value of the lease payments must be less than 90 percent of the fair market value of the equipment at the start of the lease.

### **Operating Lease**

Balance sheet:	off balance sheet
Initial payment:	none
Payments:	fixed
Ownership:	lessor
Tax deductions:	lessor
Performance risk:	lessor

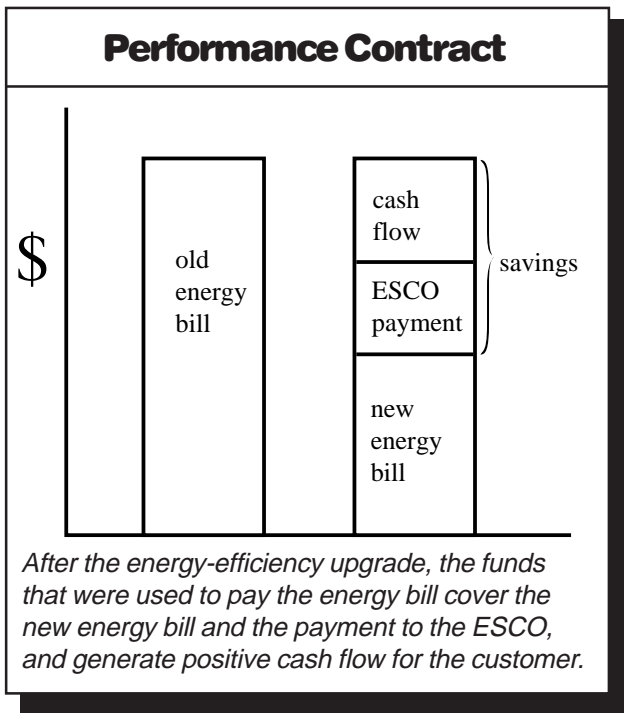
If the equipment has residual value as used equipment, it may be eligible for an operating lease.

Discuss the project's qualifications with a financial decisionmaker before entering into an operating lease for energy-efficiency equipment.

### **Performance Contracting**

As you research financing options for your project, you will certainly hear about performance contracting. A performance contract may be the preferred financing option if your organization wants to keep the upgrade project off its balance sheet. This type of contracting can be complex, but is becoming increasingly common.

A performance contract is one in which payment for a project is contingent upon its successful operation. For an energy-efficiency upgrade, services are rendered in exchange for a share of the future benefits of the project.



In a performance contract, an outside party, usually an ESCO, provides a services package. This package can range from a simple audit, installation, and monitoring to full operation of a facility's energy systems. The ESCO typically conducts an energy audit, designs the cost-effective projects, obtains bids, manages the construction, guarantees energy savings, obtains financing, and maintains the energy-saving capital improvements. You use resulting energy savings to pay for the improvements.

Performance contracts are sometimes referred to as "shared savings" or "paid from savings" contracts. These terms refer to the manner in which payment is made for the upgrade.

With shared savings, the dollar value of the measured savings is divided between you and the ESCO. The percentage distribution of the savings between the ESCO and the customer are agreed upon in advance and documented in the performance contract. At the end of the contract, ownership transfers to the building owner as specified in the contract. You may either purchase the equipment at fair market value or simply assume ownership of the equipment paid for during the contract term.

A performance contract can be undertaken with no upfront cost to the building owner and is paid for out of energy savings. The service provider, usually an energy services company (ESCO), obtains financing and assumes the performance risks associated with the project. The financing organization owns the upgraded equipment during the term of the contract, and the equipment asset and debt do not appear on your balance sheet. Financing for performance contracts relies little on the financial strength of the building owner, but is based on the cost savings potential of the project.

Through performance contracting, any of the financing options discussed above can be negotiated to guarantee that, as the customer, you receive the estimated cost savings from the energy-efficiency upgrade. Performance contracting can be applied to purchases or leases.

Almost all energy-efficiency projects are paid for from the savings created by reduced energy usage. Thus, the term "paid from savings" can be used for several different types of energy contracts. Here it is being used to refer to another performance contract payment whereby you pay the ESCO a predetermined amount each month (e.g., an amount equal to 80 percent of the expected energy bill before the upgrade). The ESCO pays the energy bill and retains the difference between your payment and the actual bill (e.g., the actual bill may be only 60 percent of the expected bill). In this case, if there is an increase in energy usage, the ESCO must make up the difference between your payment and the actual bill.

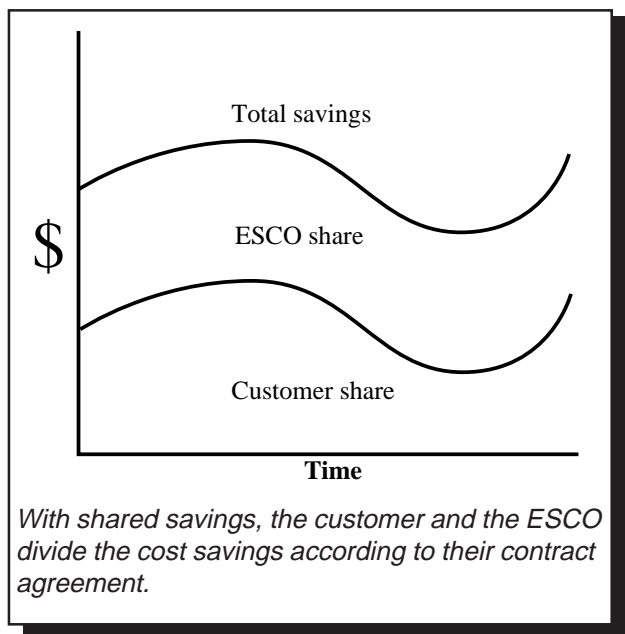
Exhibits 2A and 2B illustrate the distribution of the cost savings under two scenarios. The specific payment arrangements between you and the ESCO are specified in your contract.

For an ESCO and financier to make a commitment to an energy-efficiency project, the potential for savings must be substantial. Performance contracts are usually arranged for facilities with annual energy costs over \$150,000. However, smaller lighting projects may be good candidates depending on the project specifics.

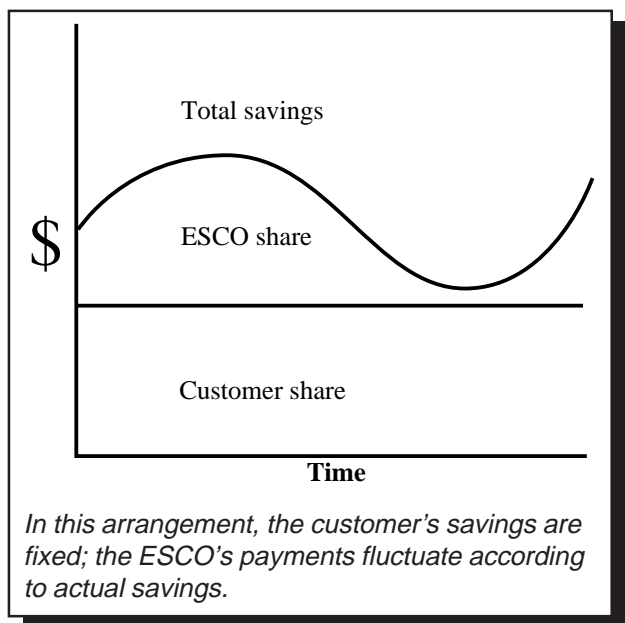
Entering into a performance contract is like forming a partnership with an ESCO. You are arranging a complex, long-term relationship through a contractual agreement. It is important for you to remain in close communication with the ESCO during contract negotiations and project implementation. Build contingencies into the contract for any potential issues you can anticipate. For example, an operations change such as

<b>Performance Contracting</b>	
Balance sheet:	off balance sheet
Initial payment:	none
Payments:	variable or fixed
Ownership:	contractor
Tax deductions:	contractor
Performance risk:	contractor

## EXHIBIT 2A Shared Savings



## EXHIBIT 2B Paid From Savings



changing operating hours can have a significant impact on energy use. By incorporating responses to likely changes up front, you can avert major operational or contractual problems down the road.

A performance contract is a major commitment for you and the ESCO. As a financing tool, it offers the benefits of low-risk capital improvements off the balance

sheet. Although there are not initial payments to the contractor, you should expect to spend time and resources providing data the ESCO will need to perform the audit and establish a baseline from which to estimate energy savings. If you wish to select an ESCO through a competitive procurement, you will have to prepare requests for qualifications or proposals and evaluate the submittals. Defining all the terms and conditions of the contract can be a lengthy process and may require hiring independent engineers or other professionals to review the contract on your behalf. The business of performance contracting is growing, so there is an expanding pool of competent and capable service providers available to you. Although the contracting process is complex, it creates an opportunity for organizations with limited debt capacity or capital resources to undertake profitable energy-efficiency projects that would otherwise not be implemented.

## EVALUATION CRITERIA

Finding the right financing vehicle for your project requires a thorough evaluation of your options. The following factors will help define your organization's business profile. This will enable you to select the financing option that best meets your organization's objectives.

- Balance sheet
- Initial payment
- Payments
- Ownership
- Tax deductions
- Performance risk

A brief description of each follows.

### Balance Sheet

If your organization is near the level of debt permitted by your lenders, you may not be able to undertake additional debt on your books without violating certain covenants. There are, however, methods that enable a company that cannot assume more debt to proceed with an upgrade and take advantage of the financial benefits.

### Initial Payment

A large initial capital outlay may be an obstacle for some organizations planning energy-efficiency upgrades. If you have large capital reserves or are planning a small project, it makes sense to pay for the project with cash. Then all the cost savings from the project will be immediately available to you to offset the original investment. There are financing options that can move a project forward with no initial capital outlay

from you, the customer. If capital resources are tight, you may want to consider a performance contract.

## Payments

Your goal is to obtain financing at a minimum cost to your organization. However, benefits such as off-balance-sheet financing may justify paying more for your borrowed money. The general advantage of energy-efficiency investments is that even with performance contracts, which tend to be more costly because of the amount of monitoring and verification involved, you are guaranteed to receive financial benefits immediately upon completion of the project. At the end of the contract term, those savings are fully available to you.

## Ownership

If you are the owner of your energy-efficiency upgrade equipment, you are entitled to the benefits of ownership, such as tax deductions for depreciation or interest payments. You are also liable for any performance risk associated with the equipment.

## Tax Deductions

As an equipment owner, your business is entitled to any tax benefits such as depreciation and deductions for loan interest. If you finance your upgrade off the balance sheet, you will not be eligible for tax benefits.

## Performance Risk

There is risk associated with any investment. Energy-efficiency upgrades are generally low-risk investments because they apply proven technologies with long records of performance. However, the financing option you choose will affect who bears the risk of performance failure.

Performance risk of energy-efficiency upgrades depends on the accuracy of the assumptions such as maintenance, cost of energy, and occupancy. Lighting upgrades are typically considered a lower risk due to more certainty in managing these assumptions than HVAC investments.

## SUMMARY OF OPTIONS

Whether your energy-efficiency project involves small improvements or a complete system upgrade, there is a suitable financing option for you. A simple cash purchase yields immediate benefits to the customer and is a straightforward transaction. It is well suited for small or low-risk upgrades. Performance contracting is the most complex type of arrangement but offers the customer the benefit of risk protection. It is also the most

costly financing option because of the amount of monitoring and verification required. However, even this more expensive alternative yields a positive cash flow for the customer immediately upon installation. Regardless of your organizational requirements or constraints, there is a financing option available to help you realize the profitability of energy-efficiency projects. How to financially compare upgrade options is discussed in the next section.

## FINANCIAL ANALYSIS

Financial profitability is vital to your success. Many methods exist to measure the profitability of a lighting upgrade. This section addresses three: simple payback, internal rate of return (IRR), and net present value (NPV). This discussion also includes a brief overview of cash flow analysis, which is part of calculating both IRR and NPV.

A simple example will be the basis of this discussion. Suppose you have two upgrade options for a building. Each option is assumed to provide financial benefits for over 10 years, after which the Partner plans to vacate the building and abandon future savings. Cash flows and profitability measures are presented below in Exhibit 3. A three percent inflation factor is assumed. If you were to choose between these two options based on simple payback or IRR, Option A would win easily. If you look instead at NPV, Option B seems the superior choice. What's going on? Which measure leads you to the best decision?

As the rest of this section will explain, NPV is the best measure to use when comparing or prioritizing upgrade options. IRR is a valid tool as well, but only for assessing whether an *individual* option is profitable (yes or no), not for comparing two options. Simple payback is not as useful as IRR or NPV, for reasons that will be explained below.

## Simple Payback

Simple payback calculations reveal the number of years it takes a savings-generating project to recoup the initial investment. To calculate simple payback, divide the initial project cost by its annual net savings.

$$\text{Simple Payback} = \frac{\text{Initial Project Cost}}{\text{Annual Net Savings}}$$

Using the information in Exhibit 3, you can calculate simple payback for each option. Based on simple payback alone, Option A would be the preferred upgrade, since it has a shorter payback.

### EXHIBIT 3

## Comparing Two Lighting Upgrade Options Using Different Profitability Measures

Year	Upgrade Option A		Upgrade Option B	
	Initial Cost	Savings Generated	Initial Cost	Savings Generated
0	\$100,000	0	\$400,000	0
1		\$40,000		\$110,000
2		\$41,200		\$113,300
3		\$42,436		\$116,699
4		\$43,709		\$120,200
5		\$45,020		\$123,806
6		\$46,371		\$127,520
7		\$47,762		\$131,346
8		\$49,195		\$135,286
9		\$50,671		\$139,345
10		\$52,191		\$143,525
Cumulative Savings Over Ten Years		\$400,000		\$1,000,000
Simple Payback		2.5 years		3.6 years
IRR		41%		27%
NPV		\$84,224		\$106,615

#### Upgrade Option A Payback

★  $\$100,000/\$40,000 = 2.5$  years

#### Upgrade Option B Payback

★  $\$400,000/\$110,000 = 3.6$  years

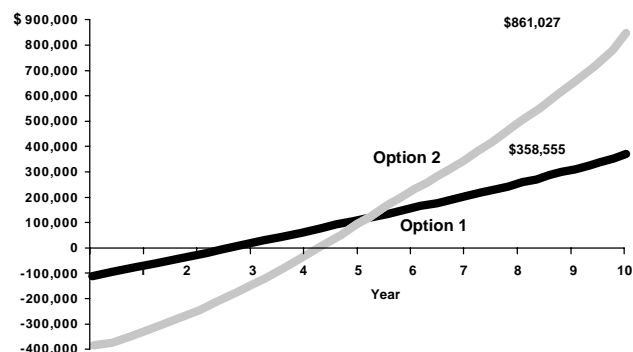
Simple payback is widely used in the energy management industry. It is easy to understand, and does not require detailed calculations or cash flow projections. Additionally, it is an inherently conservative way to evaluate energy upgrades.

#### Drawbacks of Simple Payback Method

Simple payback has two serious drawbacks that limit its usefulness. First, **it does not consider savings that occur after the payback point**, and thus provides only a limited view of a project's lifetime profitability. Looking at the example, Option B generates more profit over its lifetime than Option A, despite Option A's shorter payback. Exhibit 4 makes this difference even clearer. *Payback does not completely describe project profitability.*

Simple payback's second drawback is that **it does not take into account the time value of money**. In a world of interest rates, people universally value money received today more highly than the same money received ten years from now. Properly comparing and choosing between long-lived upgrade options requires a decision-making tool that incorporates the time value of money. *Discounted payback* measures have been developed to address this drawback. While preferable to simple payback, they still suffer from the first drawback described above.

### EXHIBIT 4 Why Payback Isn't Enough



## Cash Flow Analysis

Two profitability measures avoid the flaws associated with simple payback: IRR and NPV. Before discussing these, a brief overview of cash flow analysis follows. This analysis is the basis for calculating IRR and NPV.

No matter which profitability measure you choose to assess lighting upgrade projects, a year-by-year cash flow analysis should be part of your assessment. Although it requires more time and effort than a simple payback approach, cash flow analysis provides financial insights into proposed upgrades that you cannot afford to miss. When supplemented with IRR or NPV, this analysis shows you the whole picture concerning profitability.

To perform a cash flow analysis, construct a table or spreadsheet, similar to Exhibit 3. EPA recommends a twenty-year analysis period for lighting upgrade projects. Fill the table with your best estimates for each type of cash flow, for each year of a project's lifetime.

Remember to include labor and materials in the maintenance cash flows; and consider including inflation factors where appropriate. If you have not done a cash flow analysis before, do not make precise estimates at this stage. Concentrate on identifying each type of cash flow affected by the upgrade, and entering quick best-estimates for each category. You can refine the analysis later.

For simplicity, one cash flow element not shown here is tax effects. Lighting upgrades generally affect your organization's income tax bill in several ways: by increasing depreciation, by decreasing energy and maintenance expenses, and if debt financing is used, by increasing the interest deduction. If you are not familiar with these tax effects, you can omit them from your cash flow analysis as long as you keep in mind that the results will be expressed in pre-tax terms.

This series of yearly net cash flows will reveal much about the project's financial attractiveness without further analysis. However, to obtain a single profitability measure or to compare two projects easily, you will need to calculate IRR or NPV.

## Internal Rate of Return

IRR is a profitability measure, expressed in percentage terms, that is analogous to an average annual rate of return from an investment. Technically, IRR represents the discount rate that causes the project's NPV to equal \$0. In simpler terms, IRR shows the annual rate of return a project generates. Keep in mind that IRR is not quite the same as a simple ROI (return on investment) measure.

IRR calculations avoid the two primary drawbacks of the simple payback method: blindness to savings occurring after the payback point and not taking account of the time value of money. Since IRR is based on net cash flows calculated over the full lifetime of the upgrade, it provides a complete picture of the upgrade's profits. IRR also discounts future cash flows, incorporating the time value of money and avoiding overvaluing cash flows.

IRR is the measure EPA has chosen as the basis for the Green Lights profitability test. It is simple to calculate with a financial calculator or spreadsheet program. The *Green Lights ProjectCalc* software also calculates IRR. If a project's IRR is greater than the firm's cost of capital for lighting upgrades, then the project is worth doing. For Green Lights projects, EPA recommends using an IRR of 20% as the cost of capital, because of the low-risk nature of lighting upgrade projects.

To calculate IRR using one of these tools, you need yearly estimated cash flow changes generated by the upgrade over its lifetime (Exhibit 3). As described above, IRR is superior to payback measures. Additionally, it is familiar to the business community and is independent of project size (unlike NPV).

## Net Present Value

Though less familiar to many in the lighting industry than simple payback, *NPV is the most powerful tool for assessing profitability*. NPV represents the total net cash flows a project generates over its lifetime (including first costs), with discounting applied to cash flows that occur in the future. NPV represents the financial equivalent (in cash payable today) of the cash flows generated by an investment over its lifetime, including the initial investment. If the NPV is less than \$0, the project is not profitable; if the NPV is greater than \$0, the project is profitable (it "pays" to proceed with the project). The project that yields the highest NPV is the most profitable (or represents the highest financial value).

To calculate NPV, you need yearly estimated net cash flows for the upgrade (Exhibit 3) and the appropriate discount rate to be applied to future cash flows. Most firms use their average cost of capital as the discount rate. For Green Lights upgrades, using 20 percent as the discount rate will keep your results consistent with the IRR-based Green Lights profitability criterion. **If a project's cash flow yields an NPV greater than zero (and a discount rate of 20 percent is used), then the project meets the Green Lights profitability criterion.**

Once you have estimated year-by-year net cash flows and have selected the discount rate, you can use a financial calculator or a PC-based spreadsheet program to easily calculate NPV. With either approach, the mechanics of calculating NPV are simple.

## NOTES:

**NOTES:**

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## **GREEN LIGHTS®**

### ***A Bright Investment in the Environment***


Green Lights, one of several ENERGY STAR programs, is sponsored by the US Environmental Protection Agency (EPA) and encourages major US corporations and other organizations to install energy-efficient lighting technologies.

Organizations that make the commitment to Green Lights will profit by lowering their electricity bills, improving lighting quality, and increasing worker productivity. They will also reduce the air pollution caused by electricity generation.

For more information, contact the Green Lights program office.

Green Lights Program  
US EPA  
401 M Street, SW (6202J)  
Washington, DC 20460

#### ***ENERGY STAR Hotline***

 1-888-STAR-YES (1-888-782-7937)  
Fax: (202) 775-6680

#### ***Green Lights Homepage***

[www.epa.gov/greenlights/](http://www.epa.gov/greenlights/)

#### ***ENERGY STAR Homepage***

[www.epa.gov/energystar/](http://www.epa.gov/energystar/)

*Financial Strategies* is one of a series of documents known collectively as the *Lighting Upgrade Manual*. Other documents in the Manual are Listed below.

### **LIGHTING UPGRADE MANUAL**

#### ***Planning***


- *Green Lights Program*
- *Implementation Planning Guidebook*
- *Financial Strategies*
- *Lighting Waste Disposal*
- *Progress Reporting*
- *Communicating Green Lights Success*

#### ***Technical***

- *Lighting Fundamentals*
- *Lighting Upgrade Technologies*
- *Lighting Maintenance*
- *Lighting Evaluations*
- *The Lighting Survey*

#### ***Appendices***

- *Upgrading Tenant Spaces*
- *Green Lights for Federal Participants*
- *Requesting Proposals*

 To order other documents or appendices in this series, contact the ENERGY STAR Hotline at 1-888-STAR-YES. Look in the ENERGY STAR *Update* newsletter for announcements of new publications.

