

Analyzing Sustainability Impacts

*Here's a practical tool
you can use to
determine the real costs
and benefits of
going green.*

**By Marc J. Epstein and
Kristi Yuthas**

Companies today are under constant pressure to “go green,” and sustainability has become a critical factor in corporate competitiveness for many. Customers, investors, employees, and other stakeholders want to know the environmental and social impacts of corporate activities. Managers would like to make more sustainable choices, but the relentless demand for financial performance can make them hesitant to do so. Some sustainability decisions are no-brainers—reducing materials use, becoming more energy efficient, recycling—but most choices are far more challenging and can pit financial results and social impacts directly against each other. When that happens in competitive markets, financial demands usually win out.

In many cases, the sustainable choice is the best choice financially but loses out to another alternative because of flaws inherent in the cost-benefit analysis. In traditional decision making, only direct financial costs and benefits are factored into decisions—the full monetary consequences that arise as a result of environmental and social impacts are overlooked. In part, this may be the result of “triple-bottom-line” thinking, which separates the financial impacts of organizational activity from sustainability

impacts by creating separate bottom lines for economic, environmental, and social impacts. Yet there's growing evidence that the economic bottom line is affected by these sustainability impacts as they influence the choices and actions of economic stakeholders. Companies need to develop the ability to anticipate these effects and incorporate them into cost-benefit analyses.

Those seeking to make rational financial decisions must learn to identify the social and environmental impacts of decision alternatives, anticipate stakeholder reactions to the impacts, and estimate the monetary results of the reactions. Failing to do so can lead to decisions based on grossly inaccurate perceptions of the payoffs of various decision-making alternatives.

Need for a New Decision-Making Tool

Financial managers are increasingly asked to weigh in on the financial consequences of decisions likely to have environmental or social outcomes. When this happens, they are likely to adapt familiar tools to attempt to incorporate these outcomes.

Most commonly, full- or activity-based costing models are adapted to include sustainability-related costs, such as

the costs of certification, compliance, or fines. Companies also frequently consider these costs in capital-budgeting decisions, as financial analysts factor in the likelihood of stricter financial regulations or more demanding customer requirements years down the road. Such approaches represent a big step beyond traditional decision-making models that treat costs of compliance, health and safety, and other environmental and social costs as if they were isolated from specific products, customers, or programs. Still, these methods aren't comprehensive enough to ensure that a full range of potential costs and benefits is included in decision making.

Sustainability experts have produced tools that provide a much more comprehensive approach to understanding sustainability outcomes. Most of these tools are grounded in the lifecycle analysis approach, which is increasingly well-known to operational and engineering managers in many companies. Lifecycle analysis has evolved over the past three decades from a tool focused on energy use to incorporate full environmental burden and, more recently, social impacts. Lifecycle sustainability analysis adds analysis of knowledge gaps and requirements to the assessment and helps analysts focus on disciplinary models to address specific decisions or challenges. These are excellent tools for the kind of thorough, scientific analysis required when making high-stakes product and process design decisions. But these tools are enormously complex and require sophisticated data-gathering analysis that renders them too costly for the majority of decision-making situations.

Financial managers need basic models that incorporate the most significant variables, are robust enough to accommodate a wide variety of decisions, and provide results that are simple to communicate. We attempt to help fill this gap by providing a simple and familiar cost-benefit approach that's enhanced and improved through the addition of sustainability outcomes.

We developed the cost-benefit tool presented here specifically with the needs of financial managers in mind. It allows them to simultaneously consider the financial and social outcomes of potential decisions without the need for advanced knowledge of sustainability models or methods. The tool is built on a decision-making model that highlights operational and sustainability outcomes. The underlying model is an adaptation of a corporate sustainability model presented in an article by Marc J. Epstein titled "Implementing Corporate Sustainability: Measuring and Managing Social and Environmental Impacts" (*Strategic Finance*, January 2008). We developed

the tool to highlight the financial impacts of sustainability outcomes and provide a straightforward approach for incorporating them into cost-benefit decisions.

The tool can be used for quick, ad hoc decisions made by individual managers, or it can be used as part of a comprehensive analysis of a strategic initiative. Here we provide an example of how the model can be applied to a common, everyday decision many organizations face: whether to alter factor inputs and production processes to reduce negative environmental impacts of the products or services offered.

Operational and Sustainability Outcomes

Analyzing the costs and benefits of programs that have environmental or social impacts requires a new way of thinking about decision outcomes. Here we rely on a model that assumes that these programs have both operational and sustainability performance outcomes. The model is built on the well-known approach used in causal linkage models and strategy maps (and in theory-of-change and logic models used by social enterprises and not-for-profits).

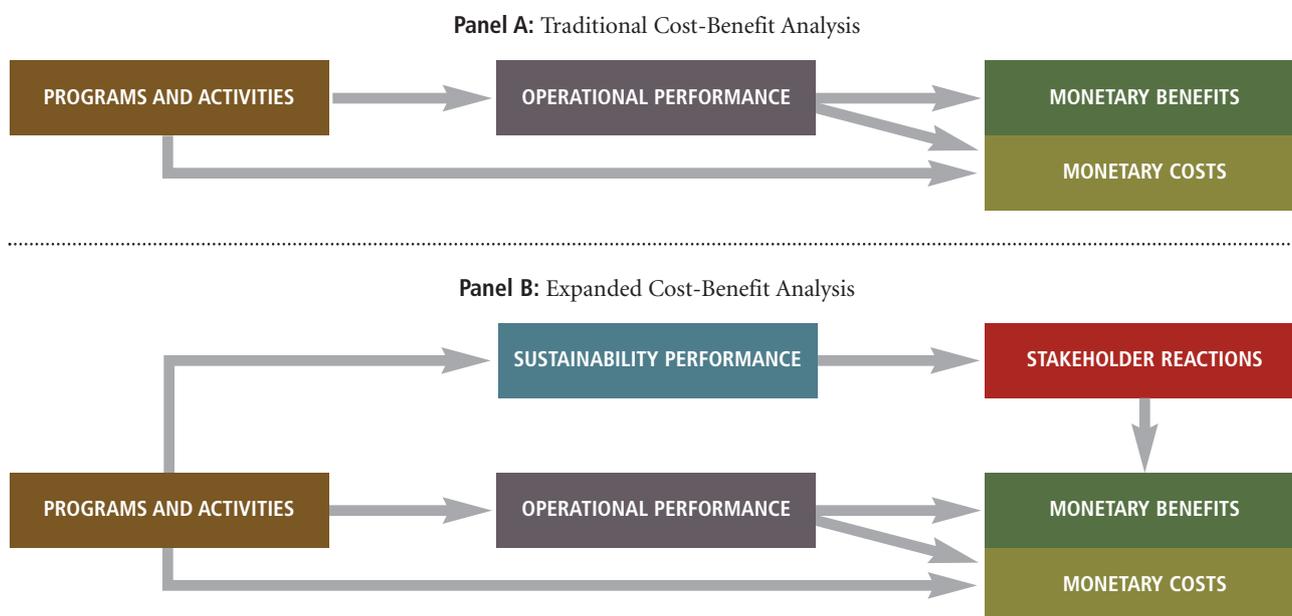
Panel A of Figure 1 depicts a traditional model for analyzing the costs and benefits of organizational programs or actions. The company engages in actions that require monetary expenditures. The actions also result in operational performance outputs, such as products or services, and these performance outputs result in monetary benefits and costs.

Panel B shows an enhanced model of the costs and benefits of organizational programs. This enhanced model can be used for any program, but it's particularly useful for initiatives that are expected to have impacts that extend beyond traditional business partners such as customers or suppliers. It also adds two key elements to the cost-benefit calculation: sustainability performance and stakeholder reactions. Let's look at the basic components of the model.

Sustainability Programs: Actions taken by the organization to initiate and operate sustainability initiatives. For example, if an accounting firm engages in an initiative encouraging employees to use public transportation for work-related travel, the initial requirements of developing and marketing the program to employees, as well as the ongoing actions required to provide and process discounted transit passes, would be program-related actions.

Operational Performance: Performance outcomes

Figure 1: Cost-Benefit Analysis with Sustainability Outcomes



that result from the sustainability program. For example, if a sustainability initiative involves simplified packaging, the reduction in material processing and shipping time would be considered part of operating performance. Sustainability outcomes that also are traditional outcomes are included here as well. For example, if materials used and waste produced are also affected, those changes would be reflected in operating performance.

Sustainability Performance: Performance outcomes relating to social or environmental impacts. For example, a company switching its sales-force fleet from gasoline-powered cars to hybrids would reduce its carbon emissions; a company instituting a diversity awareness training program might increase the number of minority hires or promotions.

Stakeholder Reactions: Stakeholders' reactions to sustainability performance outcomes. For example, obtaining Leadership in Energy and Environmental Design (LEED) certification on a building might result in media reports that increase brand awareness and attract new customers, a healthier workplace and more satisfied employees, or attention by regulators that contributes to legislation that benefits the company.

Monetary Costs and Benefits: Financial outcomes resulting from the initiative. These costs and benefits arise *directly* as traditional business outcomes related to operational performance, and they arise *indirectly* as stakeholder reactions translate into monetary impacts on

the company. For example, compensating workers for volunteer activities results in increased payroll costs. It may also result in process cost reductions ensuing from knowledge gained through volunteering activities.

But this initiative may have nonoperating benefits as well. Sustainability performance increases as the organization provides benefits to the community. Employees may react by forming a more favorable impression of the company and its role in the community, which might result in increased loyalty to the organization. This reaction might lead to monetary benefits as employee retention improves and costs of recruiting and training employees decline.

Costs and Benefits of Sustainability

Companies are adept at evaluating the financial costs and benefits associated with a broad range of initiatives and investments. Most are far less experienced at understanding the potential impact of these decisions on sustainability and considering whether and how these impacts will affect the bottom line. Businesses need guidance for moving beyond the familiar cost-benefit analysis or business-case approach in Panel A to the more inclusive approach in Panel B.

Conducting a cost-benefit analysis that incorporates sustainability outcomes requires managers to perform five basic activities:

1. Prepare the traditional cost-benefit analysis,

2. Determine sustainability outcomes,
3. Identify stakeholders,
4. Anticipate stakeholder reactions to sustainability outcomes, and
5. Estimate the monetary costs and benefits of these reactions.

Step 1: Traditional Cost-Benefit Analysis

The process begins with standard analysis of the costs and benefits of the proposed change. The initiative under consideration usually requires some expenditure, which will show up as monetary costs. The operational outcomes of the decision can take many forms and result in benefits such as increased revenues and savings on capital or operating costs or costs that include direct cost increases and loss of revenues and other benefits.

Step 2: Determine Sustainability

Performance Outcomes

Sustainability performance is affected by almost every significant corporate decision. Understanding these performance outcomes is challenging, and outcomes vary greatly across decisions. Fortunately, companies and organizations have struggled with measuring and reporting sustainability impacts for decades, so guidance is readily available. Table 1 is a generic list of environmental and social elements, both positive and negative, that are frequently affected by corporate activity. We adapted the list from the Global Reporting Initiative's list of key indicators that are most likely to be of interest to corporate stakeholders.

Companies new to systematic exploration of sustainability impacts can begin with a standardized list such as this and then add and remove key performance outcomes as they gain more experience using the model. Eventually, a checklist can be developed that can be applied to analyze the sustainability performance of each significant program or initiative.

Step 3: Identify Stakeholders

Most companies use some form of stakeholder analysis in their formal strategic planning process, and reactions of stakeholders are incorporated informally into all kinds of business decisions. But aside from customers, whose reactions directly affect sales, many other stakeholders are often overlooked in cost-benefit analysis. The process of identifying relevant stakeholders begins with consideration of a full range of stakeholders and then narrowing the list to those likely to be impacted by the sustainability performance outcomes identified in Step 2. Figure 2 pro-

vides an example of a stakeholder map that includes the stakeholders most likely to respond to corporate activities.

Step 4: Anticipate Stakeholder Reactions to Sustainability Outcomes

Once companies identify the performance outcomes and stakeholders, the process of anticipating reactions can begin. One or more stakeholder groups may react to each sustainability performance outcome. In this step, the objective is to anticipate which groups will react to each outcome and to determine whether these reactions are

Table 1: Categories of Environmental and Social Impact

Environment:

- Materials quantity and type
- Energy and water consumption
- Biodiversity
- Greenhouse gas emissions
- Waste amount and type
- Product impact and disposal

Labor Practices:

- Diversity and equal opportunity
- Fair pay
- Notice policies for contract changes
- Workplace safety
- Worker training
- Counseling and prevention services

Human Rights:

- Human rights concerns included in contracts
- Nondiscrimination policies and actions
- Child and forced labor
- Freedom of association

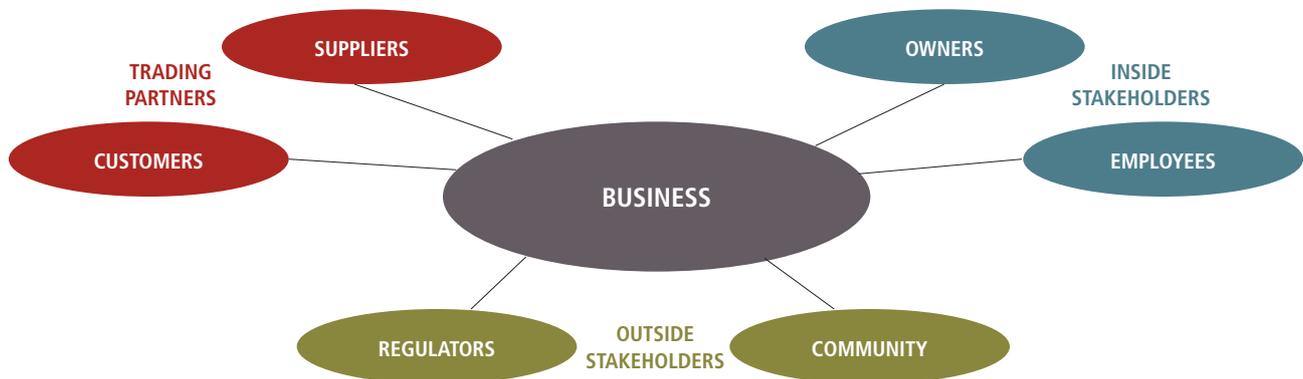
Society:

- Engagement with local community
- Community impacts
- Corruption policies and incidents
- Participation in public policy
- Fair competition practices
- Development of infrastructure

Product Responsibility:

- Customer health and safety
- Product and service labeling
- Marketing communications
- Customer privacy
- Compliance with regulations

Figure 2: Key Stakeholders



likely to be significant in magnitude. When significant changes are likely—for example, a story is picked up in the press or a supplier cancels a contract—the reaction is

included in the list of stakeholder reactions.

Table 2: Examples of Stakeholder Reactions

Customers:

- Increase spending or begin new relationship
- Decrease spending or terminate relationship
- Provide positive or negative referrals
- Adjust amount willing to pay

Suppliers:

- Strengthen or weaken relationship
- Change pricing or services offered

Owners:

- Invest in company or divest
- Adjust required rate of return

Employees:

- Increase interest in joining or staying with the company
- Reduce commitment or exit
- Increase or decrease productivity

Regulators:

- Enact or enforce regulations
- Employ tax or other incentives

Community:

- Collaborate or share information with the company
- Provide positive or negative media attention
- Spread positive or negative word-of-mouth
- Boycott or picket the company

Table 2 provides examples of ways each stakeholder group might react to corporate activities. In addition to customers, suppliers and more minor trading partners, such as service providers, can take actions that impact the company financially. Insiders, such as owners and employees, can react in ways that affect financial and operational aspects of the business. Outside stakeholders can take actions that impact the organization directly or that affect the decisions and reactions of other stakeholders. Thus the likely impact of decisions on regulatory agencies and community stakeholders such as nongovernmental organizations, advocacy groups, and the press should also be considered in the cost-benefit analysis.

Step 5: Estimate Monetary Costs and Benefits

In the final step, companies can estimate the monetary costs and benefits associated with the stakeholder reactions. Financial managers armed with a full analysis of stakeholder reactions are in the position to provide a much more comprehensive and useful estimate of the costs and benefits of a proposed initiative. Nonetheless, monetary benefits and costs can be quite difficult to estimate, particularly when valuing intangible assets, forecasting revenues, and dealing with other elements commonly included in a cost-benefit analysis.

To be sure, there can be a great deal of uncertainty in the process, but a well-informed best estimate is far superior to the \$0 value implied by leaving the item out of the cost-benefit analysis. And by making estimates transparent, they can be discussed and modified by knowledgeable decision makers. Over time, financial managers and general managers whose decisions they support gain expertise in estimating monetary impacts.

The Cost-Benefit Tool in Practice

The mechanics of using the sustainability cost-benefit tool are easy to master once you understand the model. The following example details the cost-benefit calculation of a company called CityClean, Inc., which is considering a switch to more environmentally friendly supplies.

Scenario: CityClean, Inc.

CityClean provides cleaning services for office buildings owned by the city and by private companies. The company has seen increases in customer inquiries relating to environmentally friendly cleaning methods, and the city has recently made it a priority to contract with “green” suppliers. CityClean’s CEO would like to convert cleaning solutions to more environmentally friendly nontoxic solutions. The director of purchasing estimates that the change will result in \$50,000 per year in additional costs. This cost is slightly offset by a \$20,000 reduction in labor costs. Because the nontoxic cleaners can be left on surfaces, employees save time that’s usually required to rinse surfaces with water after they have been cleaned.

A traditional cost-benefit analysis of this scenario (Figure 1, Panel A) likely would focus primarily on the operational performance and monetary outcomes of this decision. In that case, the \$50,000 cost of the planned program of switching to the new supplies would be included in the Programs and Activities category.

Any expected operating outcomes would be included in the Operational Performance category. For purposes of this decision, we’ll assume that the change is largely invisible to customers. The environmentally friendly supplies produce no significant change in the resulting level of cleanliness. Thus the only monetary impact of the change comes in the form of the \$50,000 annual increase in cleaning costs and the \$20,000 labor savings, resulting in a net cost of \$30,000.

Without a more complete exploration of potential impacts, the company is forced to conclude that there’s no business case to support the change. Unless the company could pass along those additional costs to customers willing to pay a premium for reduction in toxins, the initiative will fail.

By using the cost-benefit tool, the company can explore a full range of outcomes more completely and make a better informed decision about cleaning supplies. Figure 3 provides a very simple version of the cleaning-supply cost-benefit analysis. We’ve included a few of the most basic and direct sustainability performance outcomes and corresponding stakeholder reactions in this analysis.

The sustainability performance box adds three sustainability outcomes to the analysis. First, toxic materials have been replaced with nontoxics, which reduces the impact from the cleaning solutions being released into the environment. Because rinsing is no longer needed, the amount of water usage is reduced, as is the amount of dirty water emitted back into the environment. Finally, the cleaned offices are less toxic, producing a healthier work environment for employees and customers.

Each of the outcomes can result in stakeholder reactions that have a direct monetary impact for the company. Estimates of the revenues and cost savings associated with sustainable performance outcomes are shown in the sustainability performance and stakeholder reactions boxes and in the second, third, fourth, fifth, and sixth bullets of the monetary benefits box in Figure 3.

The use of nontoxic materials can be attractive to potential customers searching for a cleaning service that uses environmentally friendly supplies. Using nontoxic solutions is estimated to result in additional sales of \$30,000 annually.

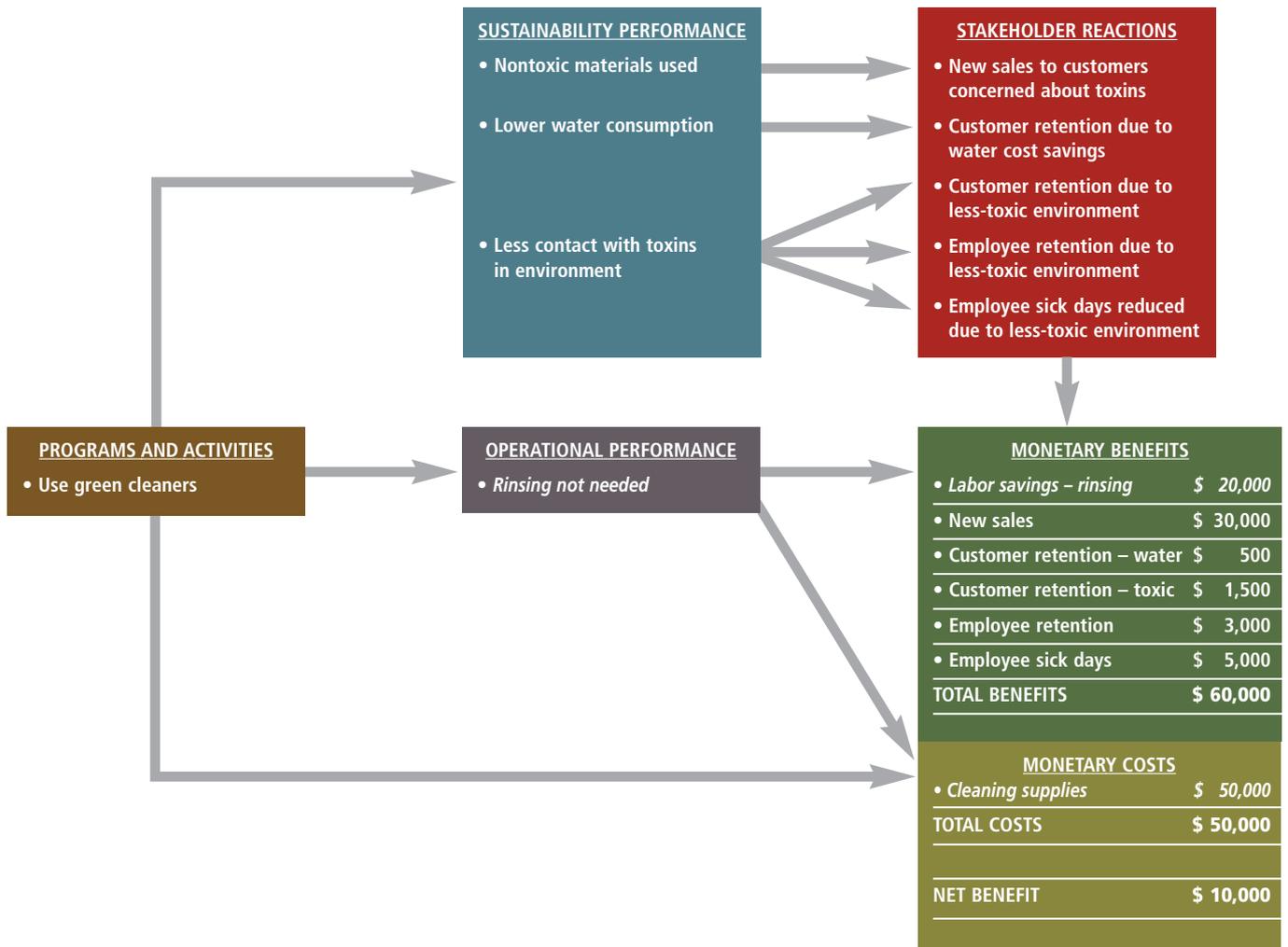
Reduced water requirements may provide benefits to existing customers, who pay for the water and who are ultimately responsible for emissions of dirty water into the environment. Their satisfaction may increase because of this, resulting in greater customer loyalty and reduced turnover, worth an estimated \$500.

Lower levels of toxins in the immediate working environment and in the customers’ workplace can have a number of benefits as well. Customers who are satisfied with the improved environmental safety are also expected to stay with CityClean longer, reducing acquisition and retention costs by \$1,500. Employees also might experience increased satisfaction, which can reduce employee turnover and associated recruiting and training costs of approximately \$3,000. Finally, because of reduced contact with toxic materials, customers may experience fewer health impacts from exposure, reducing the number of sick days and the costs associated with them, which is expected to save the company \$5,000.

The monetary benefits expected to accrue as a result of stakeholder reactions to changes in sustainability performance amount to \$40,000, bringing the total expected monetary benefits of solutions to \$60,000. These benefits exceed the increased cost of the eco-friendly solutions by \$10,000.

In this example, the company makes a better decision by using the tool. CityClean is able to gain a better pic-

Figure 3: Simple Cost-Benefit Example of CityClean, Inc.



ture of the broad range of monetary impacts resulting from this significant operational change.

The Tool Can Help

Companies are making suboptimal decisions every day because they lack the tools and knowledge needed to include sustainability performance outcomes in their decision-making models. The tool we presented here provides a straightforward method for addressing this problem. As decision makers gain experience with the tool, it will provide greater value to their organization. Initially, the simple act of uncovering assumptions about sustainability and making them concrete by including them in the model can have significant benefits. The process will provide managers with a basis for exploring and reconciling differences in their assumptions about performance outcomes, stakeholder reactions, and the financial impacts of these reactions.

As the tool is used as a basis for decisions, and real out-

comes are known, these assumptions will be tested and improved. Through this process, managers will gradually gain expertise in estimating sustainability impacts, and the decision-making tool will provide increasingly valuable information for a range of decision-making processes. This can lead to better integration of sustainability into operating and capital decisions and improved corporate sustainability and profitability. **SF**

Marc J. Epstein, Ph.D., is Distinguished Research Professor of Management at Jones Graduate School of Business at Rice University in Houston, Texas. He is also a member of IMA. You can reach Marc at (713) 348-6140 or epstein@rice.edu.

Kristi Yuthas, Ph.D., is an associate professor of accounting and the Swigert Professor in Information Systems at Portland State University in Portland, Ore. You can reach her at yuthask@pdx.edu.