



CORPORATE  
ECOFORUM RESEARCH SERIES



SHOW ME THE MONEY  
Demonstrating Green Business Value to Skeptics

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# EXECUTIVE SUMMARY

*“How could we justify a big green effort like that when we just froze salaries and laid off 200 people?”*

*“Sounds like a very worthy project, but we have others in the pipeline with stronger ROI that are still unfunded.”*

*“You’re talking about soft benefits. We need hard, bottom-line results.”*

In today’s challenging economy, executives face more pressure than ever to sharpen their business cases for eco-related initiatives. CFOs and others who control the purse strings want hard, dollars-and-cents justifications, whether for existing programs or proposed new spending.

For many “low-hanging fruit” energy-efficiency projects that promise fast payback and big ROI—such as certain types of lighting or HVAC retrofits—it’s relatively easy to crunch the numbers that will lead to a green light.<sup>1</sup> But what about cases where the bottom-line benefits are less obvious, and the skeptical CFO demands “proof”? How, for example, do you calculate the financial benefit of phasing out a chemical that governments may not ban for years to come—if ever? How do you put a number on the ROI of an employee eco-training effort that could create a more innovative culture? How do you estimate the worth of a brand-enhancing leadership play, such as being the first company in one’s industry to pledge carbon neutrality?

**This report arms you with the tools to help better show green business value to decision makers within your organization,** whether advocating for discrete projects, multi-project initiatives, capital investments, changes in process/product design or product mix, eco-friendly purchasing or green supply chain initiatives. It can also prepare you to argue for projects that aren’t branded internally as “green projects” but have strong eco-friendly attributes just the same.

This report is primarily intended to help advance

specific projects or proposals, but we hope its recommendations and tools will also help you with broader objectives—including raising the profile and priority level of green issues at the senior management and board level, integrating eco-costs and benefits into routine financial and management accounting practices, factoring green considerations into day-to-day management decisions, and enhancing external communications and reporting.

Our findings are based on a thorough review of secondary literature, discussions at the Corporate Eco Forum 2009 Annual Meeting, and interviews with business sustainability experts and executives at Global 500 companies. The report is organized into six sections:

## 1. Understanding Shortcomings in Traditional

**Accounting & Financial Analysis** summarizes the main reasons why eco-related factors are excluded from traditional finance and accounting techniques. This section reviews the main accounting innovations conceived to address these shortcomings, including activity-based costing, material flow cost accounting and environmental accounting. It also outlines key questions and terms to help you find what you need within specialized resources and communicate effectively with others.

## 2. Outlining the Logic and Assumptions Behind Your Case

describes how you can map out your hypotheses for how your proposal(s) will lead to business value, and it provides guidance for identifying specific ways your proposal will affect sales and cost factors. It urges you to consider the likely objections you will face from internal skeptics, then to identify the key assumptions that will need proof—whether through qualitative or quantitative means.

## 3. Identifying, Measuring & Monetizing Key Metrics

outlines basic steps that are helpful in almost any situation—including the identification of metrics that, if measured and monetized, will help you to produce

the most convincing analysis and business case. It then provides an annotated guide to recommended resources and tools for translating eco-factors into dollars and cents, which will help you develop a plan tailored to your particular needs.

- 4. Considering Non-Financial Ways to Quantify Costs & Benefits** outlines techniques for generating meaningful qualitative metrics that could support your case, recognizing that sometimes you won't have the time or resources to translate every cost and benefit into dollars and cents—or may not need to. It reviews weighted-criteria approaches to cost-benefit analyses and the use of performance indicators such as “return on resources” and “product to nonproduct ratio” to reinforce the potential value of eco-efficiency measures.
- 5. Pointing to Other Success Stories** recommends identifying case examples of how your company or others have already generated bottom-line benefits from doing what you propose. It includes several ROI success stories to get you started.
- 6. Finalizing Your Case** offers additional recommendations to consider when building your business case, including: testing and refining your assumptions; using creative techniques to bring your data and arguments to life; adding credible external voices to the mix; and trying a portfolio approach when proposing projects.

## YOUR FEEDBACK IS VALUED

The topic of “demonstrating business value” is fertile ground for continued experimentation and the exchange of best practices and lessons learned. After reading this report, we hope you will take a few minutes to respond to a [brief online survey](#) to share comments and provide feedback regarding how CEF can build on the research in 2010.

# 1. SHORTCOMINGS IN TRADITIONAL ACCOUNTING & FINANCIAL ANALYSIS

*“I’ve been looking over your ‘green’ proposal. It’s fine, just fine—I’m sure it’ll make people feel real good about the company... Should go over big with the tree huggers too... But see, the folks that I report to—they don’t eat granola. So let me ask you: Why would I sign this?”*

*—Skeptical executive in 2009 IBM TV commercial*

We’ve all been there. Eyes glaze over at the mere mention of environmental issues. Colleagues use words like “soft” and “fluffy” when asked about their views on “sustainability.” Financial executives think green efforts “cost too much.”

Why so much pervasive skepticism? In large measure, it’s because our traditional accounting and financial practices fail to include correct (if any) numbers for costs and benefits that environmental experts see so clearly. The result is that business decisions often get made on the basis of incomplete or distorted information.

Understanding the shortcomings of traditional accounting and financial analysis methods—and some of the innovations being developed to fix them—is a vital prerequisite to developing effective means for demonstrating green business value within your particular culture.

**A. Many eco-related costs are unintentionally hidden in overhead.** You can’t manage what you don’t measure—and you certainly can’t measure what you can’t see. Yet this is precisely what happens to many environmental costs that are routinely lumped into overhead. For example, a company might assign its total energy and waste bill to overhead, then allocate a portion of overhead to individual units based on their size or revenue—not how much energy they actually used or waste they created. This is about as fair as splitting a restaurant bill with a friend who ordered the filet mignon and Haut-Brion when you had a hamburger and soda. What’s more, the practice can distort the true

financial picture needed for smart decision-making. (See table below). And it also complicates the lives of anyone looking for eco-related cost information.

It’s hard work to track who’s responsible for what portion of environmental costs—so companies often, simply, don’t.

In response, some companies have turned to **Activity-Based Costing (ABC)**—a management accounting approach designed to improve business decisions. ABC identifies hidden costs from overhead and allocates them proportionately to the appropriate product, process, system, facility or unit based on their level of responsibility or use. When used to lift the veil on hidden eco-costs, ABC can help to eliminate unintentional but costly “cross-subsidization of dirty or environmentally damaging products, processes, sites and departments.”<sup>2</sup> Most important, it can generate more complete financial information to empower decision makers—senior execu-

## ALLOCATING ECO-COSTS TO OVERHEAD CAN DISTORT THE TRUE FINANCIAL PICTURE

	'Clean' Process A	'Dirty' Process B
Revenues	\$200	\$200
Production costs	\$100	\$100
Environmental costs	\$0	\$50
True Profit	\$100	\$50
If environmental costs are overhead	\$25	\$25
Then the book profit is	\$75	\$75
Which is incorrect by	-25%	+33%

**Process A (Clean)** does not cause any environment-driven costs for the company, whereas **Process B (Dirty)** causes \$50 of extra eco-costs. When the bill for eco-costs is charged to general overhead and allocated equally, both processes appear to create a profit of \$75. In reality, Process A had a \$100 profit while Process B only contributed a \$50 profit.

Source: “Example of Correct and Incorrect Cost Allocation,” Schaltegger, Müller, 1997, cited in UN Environmental Management and Accounting Procedures, p. 74.

tives, line managers, cost analysts, engineers, designers and others—to make smarter decisions about priorities, budgets, product or process design, pricing and investments.

**B. Traditional accounting practices obscure the real cost of materials.** A comprehensive, accurate assessment of a company’s environmental costs requires good data on the real costs of materials—which, in turn, relies on non-monetary data on the use, flows and final destination of energy, water, materials and wastes. As the International Federation of Accountants reports, such information is important because “(1) the use of energy, water and materials, as well as the generation of waste and emissions, are directly related to many of the environmental impacts of organizational operations and (2) materials purchase costs are a major cost driver in many organizations.”<sup>3</sup> With conventional accounting, however, such data is inconsistent, incomplete, scattered and imprecise.

In response, some companies have used **Material Flow Cost Accounting (MFCA)** techniques to track all physical inputs and outputs (including raw materials, energy and water), and determine their effect on costs.<sup>4</sup> MFCA provides data on “costs related to products and material losses (waste, recycled materials, emissions) in different parts of the production process including material, system, labor, energy and waste management costs.”<sup>5</sup> It helps management to “reassess production costs and percentage amounts added in the various phases of production.”<sup>6</sup>

The accounting for all energy, water, materials and wastes flowing into and out of an organization is called a **materials balance** (also referred to as input-output balance, mass balance or eco-balance)—the idea being that all physical inputs eventually become outputs, either as products or as waste and emissions, and inputs and outputs must balance.<sup>7</sup> Some companies calculate **energy balances** and **water balances** separately from

other materials balances. “The level of precision of a materials balance can vary, depending on the specific purposes of the information collection and the availability and quality of the data.”<sup>8</sup> Like activity-based costing and accounting, MFCA can help managers spot opportunities for greater savings in resources, waste and emissions. It can also be a vital part of producing the evidence you need to show the true costs and benefits of “green.” The methodology is currently being standardized through ISO and is expected to be published as ISO 14051 in 2011.<sup>9</sup>

### MATERIAL FLOW ACCOUNTING AT FUJITSU

Fujitsu depends on material flow accounting techniques to inform decisions about products, processes and facilities and in calculating its “**Cost Green Index**”—a performance indicator that combines productivity, cost performance and environmental performance for material inputs. Fujitsu calculates the Cost Green (CG) Index score for each material input as follows:

$$CG\ Index = \left( \frac{\text{amount of input}}{\text{production}} \right) \times \left( \frac{\text{input unit}}{\text{price}} \right) \times \left( \frac{\text{input per unit}}{\text{of environmental impact level}} \right)$$

**C. Traditional ROI and cost-benefit analyses fail to account for hard-to-quantify costs and benefits that are real and significant.** Activity-based and material flow cost accounting techniques can help produce more accurate results than traditional cost-accounting methods, but they will only quantify a subset of the eco-related costs and benefits on which your business case might hinge. As with traditional accounting techniques, ABC and MFCA do not account for intangible, less quantifiable and contingent factors—for instance, the cost of keeping a customer loyal, the benefit of improved stakeholder perceptions or the savings of avoiding a future chemical spill. (See “Categories of Eco-Costs and



Benefits” on page 7 for more examples). If tracked and measured for decision makers, such factors could lead to entirely different outcomes. But such less tangible items aren’t usually counted.

In response, practitioners have experimented with a range of **environmental accounting** methods to track and quantify costs and benefits more comprehensively. The umbrella term “environmental accounting” is used to cover a wide range of methods that rely on activity-based costing and material flow cost accounting but factor in an even broader set of internal and external factors.

With the innovations in environmental accounting, however, has come a flood of confusing terms that have stifled the exchange of best practices and lessons learned. People have used words like **full, total, true and life cycle** in discussing **cost accounting and assessment** “to emphasize that traditional approaches were incomplete in scope because they overlooked important environmental costs (and potential cost savings and revenues).”<sup>10</sup> But the level of precision and clarity in the literature and conversations varies widely, and

terminology can differ depending on a person’s professional background (e.g. a sustainable development expert versus an accountant), company or country.

“Eighty-four percent of companies do not formally integrate social and political risks in financial calculations and capital investment decisions. ...Often, only the payback period for [sustainability] investments is calculated, without consideration for the time value of money, the broad array of affected constituencies, or significant future benefits and costs associated with the proposed projects.”

—Marc J. Epstein, Distinguished Research Professor of Management, Rice University

To give just a few examples: Environmental management accounting (EMA) “has been variously called EA, EMA, environmental cost accounting (ECA), full cost accounting (FCA), total cost assessment (TCA), etc.”<sup>11</sup>

## WHY DO ECO-FACTORS GET LEFT OUT?

Boston Consulting Group points to three main challenges:

**TIME HORIZONS.** Eco-related costs and benefits can be enormous, but their effects often fall outside “the one-to-five-year time horizon typical of most investment frameworks. This is “further exacerbated by the short-term performance expectations of investors and analysts.”

**COMPLEXITY.** “Companies find it difficult enough to identify, measure and control all of the tangible facets of their business systems. So they often do not even attempt to model intangibles or externalities.”

**UNCERTAINTY.** Many environmental costs are contingent, based on the possibility of future conditions or events. “Factors contributing to uncertainty include potential changes in customer preferences and regulation. Strategic planning, as traditionally practiced, is deductive—companies draw on a series of standard gauges to predict where the market is heading and then design and execute strategies on the basis of those calculations. But sustainability drivers are anything but predictable.”

Source: Boston Consulting Group. *The Business of Sustainability*. Boston: Massachusetts Institute of Technology, 2009.

The same “TCA” abbreviation is used for both total cost assessment and for total cost accounting, which have different meanings. Environmental experts use “full cost accounting” usually to refer to frameworks that accommodate “external” (societal) costs and benefits, yet professional accountants use “full costing” to mean “the allocation of all direct and indirect costs to a product or product line for the purposes of inventory valuation, profitability analysis and pricing decisions.”<sup>12</sup>

Inevitably you will encounter muddled jargon and conflicting definitions as you dive deeper into specialized discussions and literature on this topic. The following three simple questions and chart on page 7 (“Categories of Eco-Costs and Benefits”) will help you navigate the

confusion, clarify your own terms and communicate effectively with others:

- 1) **What is the method supposed to be used for?** Regardless of what it’s called, what is the method designed to help with—cost accounting, capital budgeting, product/process design, project evaluation, cost-benefit analysis, external reporting or something else?
- 2) **What is the scope of internal (or “private”) costs and benefits covered?** Does it include only the relatively easy-to-quantify factors (e.g., direct costs that are frequently overlooked or eco-costs hidden in overhead) or the tough stuff (e.g., internal intangi-

## WHAT IS “ENVIRONMENTAL ACCOUNTING”?

Within the corporation, environmental accounting concerns the definition, assessment and allocation of environmental costs and expenditures for the purposes of cost and resource management, compliance reporting, and capital budgeting, planning, and operational decision making... One broad approach to calculating full environmental costs is to distinguish between **internal** costs (those borne by the organization) and **external** costs (those passed on to society)... Environmental accounting can be further delineated into two main areas: financial environmental accounting and managerial environmental accounting.

- 1) **FINANCIAL ENVIRONMENTAL ACCOUNTING** emphasizes the analysis and reporting component of internal costs and liabilities related to environmental matters. This is typically the domain of an accountant who prepares financial reports for lenders and investors. The assessment and reporting of environmental risks and liabilities, capitalization for environmentally related expenditures and the treatment of environmental debt, all fall into this stream of environmental accounting. In these matters accountants are guided by professional accounting standards such as the Generally Accepted Accounting Principles (GAAP).
- 2) **MANAGERIAL ENVIRONMENTAL ACCOUNTING [ALSO KNOWN AS “ENVIRONMENTAL MANAGEMENT ACCOUNTING” OR EMA]** has a different focus. It supports the internal management and decision-making process through various techniques of cost allocation, performance measurement and business analysis. This type of environmental accounting is interdisciplinary in scope. On the one hand, scientists, economists and policy advisors can identify internal and external environmental costs. On the other hand, the management accounting profession can use its expertise to allocate these costs within existing and emerging environmental and sustainability accounting frameworks.

*Excerpt from Gale, Robert J.P. and Peter K. Stokoe. “Environmental Cost Accounting and Business Strategy.” Handbook of Environmentally Conscious Manufacturing. Ed. Christian N. Madu. Norwell, MA: Kluwer Academic Publishers, 2001.*



bles, such as expenses to maintain corporate image, improved customer loyalty, or avoided costs)?

**3) Does the scope also include external (or “societal”) costs and benefits? Does it include costs or benefits**

to external stakeholders (e.g., damage to an ecosystem or creation of green collar jobs) that do not directly affect the firm’s bottom line?

**CATEGORIES OF ECO-COSTS AND BENEFITS  
A GUIDE TO COMMONLY USED TERMS**

EASIER TO QUANTIFY	HARDER TO QUANTIFY
<p><b>CASH:</b> Costs or benefits that directly affect bottom-line financial profit or loss (e.g., capital costs, labor, materials, transportation).</p> <p><b>INTERNAL/PRIVATE:</b> Costs or benefits that directly affect a firm's bottom line. Also can refer to costs for which a business can be held legally responsible. Can be direct or indirect (see below).</p> <p><b>CONVENTIONAL/USUAL:</b> Refers to costs associated with a capital or revenue project. Can be direct or indirect (see below).</p> <p><b>DIRECT:</b> Costs clearly and exclusively associated with a particular product or service (e.g., direct cost of capital investment, operations, labor, raw materials, site and waste disposal not allocated to overhead). May include recurring and non-recurring costs. Includes both capital and operations and maintenance (O&amp;M) costs.</p> <p><b>INDIRECT/HIDDEN/OVERHEAD:</b> Costs for activities or services that may benefit multiple projects/products/processes and are not easily allocated to specific projects. Can be fixed or variable, recurring or non-recurring, capital and O&amp;M, or outsourced. Examples include costs from rent, administrative staff, security, reporting, regulatory affairs, monitoring, energy use and waste disposal not tracked to individual products or processes.</p> <p><b>REGULATORY/COMPLIANCE:</b> Costs incurred to comply with federal, state or local laws (e.g., notification, monitoring, reporting, training, labeling, etc.). Could be direct or indirect. Often treated as overhead.</p> <p><b>VOLUNTARY:</b> Costs incurred for going beyond compliance. could be direct or Indirect. Often treated as overhead.</p>	<p><b>NON-CASH/NON-FINANCIAL/LESS TANGIBLE/INTANGIBLE:</b> Umbrella terms often used interchangeably to cover a range of internal and external costs or benefits that can directly or indirectly impact shareholder value (see examples below).</p> <p><b>INTERNAL INTANGIBLE:</b> Hard-to-measure but nonetheless real costs or benefits to the company. Examples include: costs to maintain customer acceptance and loyalty, worker morale and wellness, union relations, corporate image, community relations. Sometimes used to refer to avoided costs (e.g., fines, capital).</p> <p><b>IMAGE &amp; RELATIONSHIP:</b> A subset of "Internal Intangible." Costs or benefits from improved or impaired perception of stakeholders (e.g., costs associated with prolonged licensing process or tougher monitoring).</p> <p><b>FUTURE/PROSPECTIVE:</b> Costs certain to be incurred at some point, but exact timing is unknown (e.g., an asset retirement obligation (ARO) liability for future disposal of an asset or some other future clean-up obligation).</p> <p><b>CONTINGENT/CONTINGENT LIABILITY:</b> Costs that may be incurred in the future (e.g., fines and penalties, property damage costs, lawsuits, clean-up costs from an accident, personal injury claims, ecosystem restoration costs).</p> <p><b>EXTERNAL/SOCIETAL/EXTERNALITIES:</b> Costs or benefits to external stakeholders that do not directly affect the firm's bottom line and for which the firm is not (yet) financially responsible (e.g., damage to an ecosystem, long-term pollution effects). Business is not legally responsible today but could be in the future due to stricter environmental regulation, taxes or fees. Often divided into environmental or social costs or benefits, though "social" is sometimes used as an umbrella term to include environmental. May be expressed qualitatively or in physical terms (e.g., tons of releases) or in dollars and cents.</p>

*Adapted from material in: EPA. An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms, United States. EPA 742-R-95-001 (1995), pp. 34-37; and Table 1-2: "Costs typically included in Environmental Accounting" (AIChE 1999, USEPA 1995)*

## 2. OUTLINING THE LOGIC AND ASSUMPTIONS BEHIND YOUR CASE

The most important factor in developing a strong business case is the quality of your logic and assumptions. Be explicit early on in the process about how precisely you think your proposed effort(s) will generate business value. Doing so will generate a set of testable propositions that you can then set out to validate through a combination of quantitative and qualitative data.

**A. Outline the general hypothesis for how your proposal will advance core business objectives.** Outline a clear cause-and-effect rationale for how your proposed efforts will advance business priorities and shareholder value—directly or indirectly—whether through containing costs, recruiting talented people, bolstering brand reputation, heightening customer satisfaction, reducing risk, or improving productivity, profitability, time to market, market share, retention or other means.

To get started, consider the findings of William Blackburn, former vice president at Baxter International. In *The Sustainability Handbook*, Blackburn describes how a company's sustainability efforts can affect seven key sales and cost factors that drive profits, stock price and dividends (see his model on page 9):

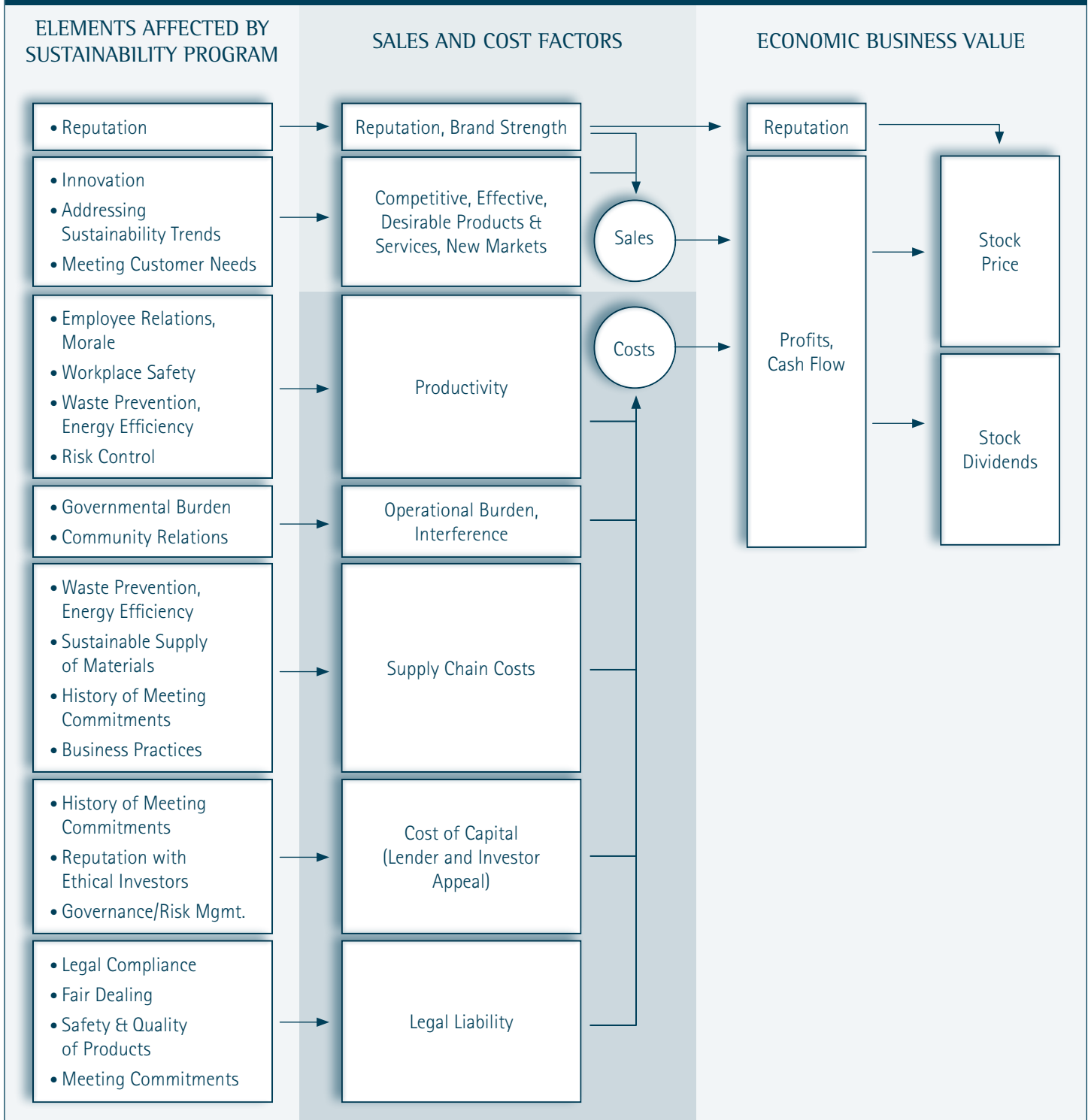
- 1) **Reputation and brand strength.** Up to one-third of a company's public reputation can be based on sustainability performance. Reputation can affect—sometimes dramatically—a company's stock price and its ability to generate sales, to charge premium prices, to close deals, to win partners, and to attract and retain talent.<sup>13</sup>
- 2) **Competitive, effective and desirable products and services—and access to new markets.** The sustainability mindset can drive the creation of innovative products and services that anticipate and better address customer needs, are more competitive, and help a company to tap into new markets—thereby increasing sales and profits.
- 3) **Productivity.** Sustainability efforts can lead to business efficiency improvements that grow the bottom

line. For instance, eco-efficiency measures can slash expenses by reducing material and energy intensity, improving recyclability, extending the life of products or equipment, eliminating toxics with high compliance costs, and preventing waste. Green building upgrades can raise employee productivity by creating a more pleasant and healthier work environment. And corporate sustainability efforts can boost employee productivity by inspiring people around a shared mission.

- 4) **Operational burden and interference.** Sustainability leadership can pay dividends in the form of fewer regulatory requirements, reduced operational burdens and costs, and greater ease in obtaining licenses to operate.
- 5) **Supply chain costs.** Sustainability efforts with suppliers and contractors can cut costs and ensure continued access to critical supplies and services.
- 6) **Cost of capital.** Investors and lenders are increasingly factoring companies' social and environmental performance into their decisions. Sustainability leaders pose fewer risks and may enjoy greater access to capital at a lower cost.
- 7) **Legal liability.** Sustainability leaders will likely avoid the kind of crippling legal liabilities (shareholder lawsuits, civil and criminal fines) that can topple giants.

**B. List all the specific ways you believe your proposal will affect sales and cost factors and create business benefits.** For instance, you may believe your proposal to eliminate a hazardous substance in the manufacturing process will generate cost savings by cutting legal expenses, eliminating the need for protective equipment for plant operations or reducing costs of hazmat training.<sup>14</sup> Or you might argue that your proposed new packaging design will lower expenses by enabling shipping to fit more units in a truck and make fewer trips, or by

## SUSTAINABILITY BENEFITS HELP DETERMINE BUSINESS VALUE: BLACKBURN'S THE SHOW-ME-THE-MONEY MODEL



Adapted with permission from William R. Blackburn. The Sustainability Handbook

cutting packaging take-back costs.

Consider all potential impacts, regardless of how difficult you think they might be to quantify. Be sure to consider the following:

- **All of potential internal and external costs** identified in the chart on page 7, “Categories of Eco-Costs and Benefits.”
- **Potential benefits across the entire life cycle of products, processes or projects.** Consider how your proposed effort could lower costs or produce benefits in the following phases: **(1) Initial or upfront phase** (prior to operating a process, product, system or facility) including costs relating to capital, siting, design, raw materials, installation, etc.; **(2) Operational or use phase**, defined as costs connected to operations and maintenance incurred during the operating lives of processes, products, systems or facilities—such as energy, water, cleaning and regulatory costs; **(3) Back-end, disposal or end-of-life phase**, which are costs that follow the useful life of products or processes—such as the disposing, recycling or reprocessing of materials, decommissioning a facility, or complying with future regulations.
- **Potential benefits across the value chain.** Consider the impact on costs and benefits in the following areas: **(1) inbound distribution or logistics**, **(2) manufacturing operations or production**, **(3) outbound distribution or logistics**, **(4) marketing and selling**, and **(5) after-sales service or maintenance**.

#### TIP

Search the Web for “Life Cycle Costing” + “[your area of analysis, e.g., green building]” to uncover specialized resources to help brainstorm all potential costs.

**C. Consider the likely objections you will face from internal skeptics, then identify the key assumptions that will need proof (whether through qualitative or quantitative data).** By fleshing out your cause-and-effect hypotheses, you will have produced a set of testable propositions—some of which may be easier to validate than others. If you seek hard numbers to validate certain conclusions, consult Section 3 (“Identifying, Measuring & Monetizing Key Metrics”). If you believe your case might be made just as powerfully through purely qualitative means (e.g., if your company has a “balanced scorecard” management system in which senior decision makers already believe that eco-factors drive value), skip ahead to Sections 4 and 5.

“We recognize that the ROI won’t always be measured in terms of dollars saved and quick payback periods. For some programs, the ROI must be viewed in the long term and the benefits—while certainly real—can’t always be neatly packaged in terms of direct financial benefits.”

—Charlene Lake, Senior Vice President for Public Affairs and Chief Sustainability Officer, AT&T

### 3. IDENTIFYING, MEASURING & MONETIZING KEY METRICS

Translating eco-related costs and benefits into dollars and cents isn't easy—and no simple, one-size-fits-all method can meet the diverse requirements of every executive reading this report. To get you started, this section outlines some basic steps that are helpful in almost any situation. It then provides an annotated guide to recommended resources and tools that will help you develop a plan tailored to your particular needs.

**A. Consider which metrics connected to your hypothesis, if measured and monetized, might help you produce the most convincing analysis and business case.**

If, for instance, you believe an employee engagement initiative will help retain talent, you might conclude that you need metrics such as the average cost of losing a good employee and the average cost of recruiting and onboarding a new hire, along with a credible way to estimate the percentage of your workforce that would stay with the company longer because of your proposed program.

**B. Be selective.** The process of getting financial numbers—especially hard-to-quantify ones—can be costly

and time-consuming. And you won't have the time or resources to gather data on everything. Moreover, your credibility could suffer if your approach is overly complex. Focus on quality of metrics, not quantity.

**“Wave riders do not ignore intangible benefits. They know that payoffs may come down the road or in a form that traditional accounting has a hard time capturing. Environmental costs and benefits are frequently diffuse or delayed, but no less real.”**

—Daniel C. Esty and Andrew S. Winston, authors, *Green to Gold*

**C. Consult the recommended resources table to develop and refine your game plan.** The following table outlines practical resources and tools that can help you identify and choose relevant metrics, obtain data, and translate data into dollars and cents for inclusion in ROI and other financial analyses.

#### RECOMMENDED RESOURCES TO HELP MONETIZE GREEN COSTS AND BENEFITS

##### A. GENERAL GUIDANCE ON ENVIRONMENTAL MANAGEMENT ACCOUNTING & TOTAL COST ASSESSMENT

RESOURCE OR TOOL	DETAILS
<p><b>EPA Environmental Accounting Project Publications</b></p> <p>Though over a decade old, these documents continue to provide valuable insights and practical tools with a rare combination of analytical depth and clarity.</p>	<p>The EPA's Environmental Accounting Project in the 1990s produced field-defining work in environmental accounting. Three publications are highly recommended:</p> <p><b><i>An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms (1995)</i></b>. A short, valuable overview of environmental accounting principles and definitions for financial and non-financial executives alike. PDF at: <a href="http://www.epa.gov/oppt/library/pubs/archive/acct-archive/pubs/busmgt.pdf">www.epa.gov/oppt/library/pubs/archive/acct-archive/pubs/busmgt.pdf</a></p> <p><b><i>Valuing Potential Environmental Liabilities for Managerial Decision-Making: A Review of Available Techniques (1996)</i></b>. Describes publicly available tools for estimating the monetary value of potential, preventable environmental liability costs. PDF at: <a href="http://www.epa.gov/oppt/library/pubs/archive/acct-archive/pubs/liabilities.pdf">http://www.epa.gov/oppt/library/pubs/archive/acct-archive/pubs/liabilities.pdf</a></p>

## A. GENERAL GUIDANCE ON ENVIRONMENTAL MANAGEMENT ACCOUNTING & TOTAL COST ASSESSMENT *(continued)*

RESOURCE OR TOOL	DETAILS
<p><b>EPA Environmental Accounting Project Publications</b> <i>(continued)</i></p>	<p><b><i>The Lean and Green Supply Chain: A Practical Guide for Material Managers and Supply Chain Managers to Reduce Costs and Improve Environmental Performance (2000)</i></b>. Provides introductory guidance on how to identify environmental costs and benefits in mainstream materials and supply chain management decision-making. PDF at: <a href="http://www.epa.gov/oppt/library/pubs/archive/acct-archive/pubs/lean.pdf">http://www.epa.gov/oppt/library/pubs/archive/acct-archive/pubs/lean.pdf</a></p> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>• Other EPA Accounting Project publications available at: <a href="http://www.epa.gov/oppt/library/pubs/archive/acct-archive/resources.htm">www.epa.gov/oppt/library/pubs/archive/acct-archive/resources.htm</a></li> </ul>
<p><b>IFAC's <i>International Guidance Document: Environmental Management Accounting (EMA)</i></b></p> <p>A 2005 guidance document for accountants and financial professionals.</p> <p>Surveys techniques to identify and quantify the full range of <b>internal and external</b> environmental and social costs.</p>	<p>The International Federation of Accountants (IFAC) commissioned this guidance document in 2005 to help "reduce some of the international confusion on this important topic by providing a general framework and set of definitions for EMA that is fairly comprehensive and as consistent as possible with other existing, widely used environmental accounting frameworks with which EMA must coexist." It was written as a guidance document for accountants rather than an implementation manual. It offers context, definitions and examples on the different EMA methodologies. Contents include:</p> <ul style="list-style-type: none"> <li>• An overview of concepts of <b>materials balances and material flow accounting</b>.</li> <li>• A set of cost categories that represents "international practice to the best extent possible" to help "provide a common language for future discussion." The categories include: <ol style="list-style-type: none"> <li>1. <i>Materials Costs of Product Outputs</i></li> <li>2. <i>Materials Costs of Non-Product Outputs</i></li> <li>3. <i>Waste and Emission Control Costs</i></li> <li>4. <i>Prevention and Other Environmental Management Costs</i></li> <li>5. <i>Research and Development Costs</i></li> <li>6. <i>Less Tangible Costs (including both internal and external costs related to less tangible issues such as "liability, future regulations, productivity, company image, stakeholder relations and externalities")</i></li> </ol> </li> <li>• A review of <b>environmental performance indicators that have a monetary component</b>, including eco-efficiency indicators.</li> <li>• <b>Real-world examples of EMA applications for internal management</b> at three different levels: (1) EMA for a site or organization as a whole; (2) EMA for a particular material or class of materials used or produced; (3) and EMA for a particular project. The examples cover a range of issues, including EMA approaches for supply chain management, logistics management, investment appraisal, and tracking annual environment-related costs.</li> </ul> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>• Free download available at: <a href="http://www.ifac.org/Store/Details.tmp?SID=1123595939318284">http://www.ifac.org/Store/Details.tmp?SID=1123595939318284</a></li> </ul>



## A. GENERAL GUIDANCE ON ENVIRONMENTAL MANAGEMENT ACCOUNTING & TOTAL COST ASSESSMENT *(continued)*

RESOURCE OR TOOL	DETAILS
<p><b>American Institute of Chemical Engineers' Total Cost Assessment (TCA) Methodology</b></p> <p>Method with manual, spreadsheets and software to identify and monetize a range of hard-to-quantify internal and external eco-related costs and benefits.</p>	<p>The American Institute of Chemical Engineers (AIChE) developed its TCA method in 2000 to help managers quantify all environmental and health costs associated with decisions about products, processes and manufacturing sites. The methodology was developed with Arthur D. Little and a team of chemical and pharmaceutical manufacturers, including Bristol-Myers Squibb, Dow Chemical, Eastman Chemical, Eastman Kodak, Georgia Pacific, GlaxoSmithKline, Merck, Monsanto, Owens Corning and Rohm &amp; Haas. Sylvatica, a consulting firm, developed the TCAce supporting software.</p> <p>The method is meant to complement, not replace, existing capital project and product development cost-estimating practices. It includes six steps that rely on a team approach:<sup>15</sup></p> <ol style="list-style-type: none"> <li><b>1. Define project goals and scope of analysis.</b> The team identifies the goals to which the analysis should be accountable (i.e., specific corporate, division or site goals relating to environmental, health or other social impacts). And it agrees upon what exactly will be assessed (e.g., assess two project proposals competing for investment dollars, or compare an old way of doing things with two proposed new approaches).</li> <li><b>2. Streamline the analysis.</b> The team places limits on the goals and scope (e.g., it may focus on a certain set of goals within the "gate-to-gate" subset of the life cycle instead of cradle to grave). It also places limits on the data collection process (e.g., it may use surrogate data when actual data is not available). The team strives to include in the TCA only the major impacts on the decision that have the potential to incur large costs.</li> <li><b>3. Identify potential risks.</b> The team assesses risk scenarios associated with each alternative under investigation. It then identifies all potential cost drivers for each scenario. Whenever possible, it assesses probability, frequency of occurrence and timing of occurrence.</li> <li><b>4 Conduct financial inventory.</b> The team assigns a value (or range of values) to each cost driver, using guidelines from the TCA methodology. Values for direct and overhead costs are derived from a company's internal cost accounting system or based on past experience with similar projects. Values for internal intangible, future, contingent and external costs are derived mainly through scenario analyses. The team documents all assumptions behind each assigned value.</li> <li><b>5. Conduct impact assessment.</b> The team enters data into spreadsheets or into the automated software program TCAce (or both) to calculate results. It conducts sensitivity analyses to test the robustness of results using different assumptions.</li> <li><b>6. Document results for feedback into company's decision loop.</b> The team documents the assumptions and results for each scenario and cost decision for consideration within the company's main decision-making process.</li> </ol> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>• Manual, spreadsheets and case studies available at: <a href="http://www.earthshift.com/About%20TCA.htm">http://www.earthshift.com/About%20TCA.htm</a></li> <li>• Information on the supporting TCAce software program at: <a href="http://www.earthshift.com/tcace.htm">http://www.earthshift.com/tcace.htm</a></li> </ul>

## A. GENERAL GUIDANCE ON ENVIRONMENTAL MANAGEMENT ACCOUNTING & TOTAL COST ASSESSMENT *(continued)*

RESOURCE OR TOOL	DETAILS
<p><b>SIGMA Sustainability and Environmental Accounting Guides</b></p> <p>Guidelines for updating P&amp;L statement and balance sheet to include <b>internal and external</b> environmental costs and benefits.</p> <p>Helpful review of methods for assigning value to external environmental costs.</p>	<p>The project on Sustainability Integrated Guidelines for Management (SIGMA) was a 1999–2006 partnership between the British Standards Institution (aka BSI Group, the United Kingdom’s leading standards organization) and two nonprofits, Forum for the Future and AccountAbility. In 2003, the project published a toolkit for financial professionals with recommended guidelines for sustainability accounting and environmental accounting.</p> <p>The <i>Sustainability Accounting Guide</i> provides recommendations and tools for incorporating sustainability-related costs and benefits into traditional financial statements as follows:</p> <ol style="list-style-type: none"> <li><b>1. How to restate the profit and loss (P&amp;L) statement to include internal sustainability-related costs and benefits</b> that directly impact the bottom line. Includes detailed discussion of the Environmental Financial Statement pioneered by Baxter in 1995, which summarizes total environmental expenditure over a given period and the resulting financial savings that have accrued.</li> <li><b>2. How to extend the P&amp;L statement to encompass external costs and benefits</b> to the environment, society and the economy that are traditionally excluded. Includes the example of Wessex Water, which publishes a set of <b>External Environmental Accounts</b> to quantify external costs and associated spending.</li> <li><b>3. How to extend the balance sheet to take a fuller account of a company’s sustainability-related assets and liabilities</b>—including intangible assets such as brands, human capital or reputation as related to sustainability and “shadow” liabilities relating to sustainability risks.</li> </ol> <p>The guide also lays out a useful summary of various ways to assign value to external environmental costs:</p> <ol style="list-style-type: none"> <li><b>1. Demand-side methods</b> based on estimating stakeholders’ “willingness to pay” (WTP) to obtain environmental benefits (e.g., improvement in local air quality) or “willingness to accept” (WTA) compensation to suffer an environmental loss (e.g., degradation in local air quality): <ol style="list-style-type: none"> <li>a. Hedonic Pricing: Uses information from a surrogate market to estimate the implicit value of an environmental good or service (e.g., differential housing prices used to estimate how much extra people are willing to pay for residential property in areas free from pollution).</li> <li>b. Travel Cost Method: Uses surveys and surrogate markets to estimate willingness to pay for environmental goods and services based on the time and expense involved in traveling to them. Used mainly to derive values for recreational sites.</li> <li>c. Contingent Valuation Method: Uses surveys, questionnaires or experimental techniques to obtain environmental preference information directly from individuals. Based on hypothetical behavior inferred from surveys or experiments rather than on actual observed behavior (and therefore the most unreliable of the three demand-side methods because it is subject to inherent bias).</li> </ol> </li> <li><b>2. Supply-side methods</b> based on the costs of supplying resources or services to prevent environmental damage, restore a place to its original state or replace something lost: <ol style="list-style-type: none"> <li>a. Preventive Expenditure (aka Avoidance Cost) Method: Based on actual expenditure incurred to prevent, eradicate or reduce adverse environmental effects.</li> <li>b. Replacement (aka Restoration Cost Method): Estimates costs once environmental damage has taken place (e.g., expenses needed to neutralize soil and water acidity from agricultural runoff).</li> <li>c. Productivity Approach: Based on costs to productivity and production due to environmental damage (e.g., costs of soil erosion connected to lost agricultural yields).</li> </ol> </li> </ol>

## A. GENERAL GUIDANCE ON ENVIRONMENTAL MANAGEMENT ACCOUNTING & TOTAL COST ASSESSMENT *(continued)*

### RESOURCE OR TOOL

### DETAILS

**SIGMA Sustainability and Environmental Accounting Guides** *(continued)*

Finally, the guide recommends specific data sources for determining environmental coefficients and values.

**For more information:**

- Download the free SIGMA *Sustainability Accounting Guide* at: [www.projectsigma.co.uk/Toolkit/SustainabilityAccountingGuide.asp](http://www.projectsigma.co.uk/Toolkit/SustainabilityAccountingGuide.asp)
- Download the free SIGMA *Environmental Accounting Guide* at: [www.projectsigma.co.uk/Toolkit/EnvironmentalAccounting.asp](http://www.projectsigma.co.uk/Toolkit/EnvironmentalAccounting.asp)

## B. MODELS FOR ROI ANALYSIS & PROJECT EVALUATION

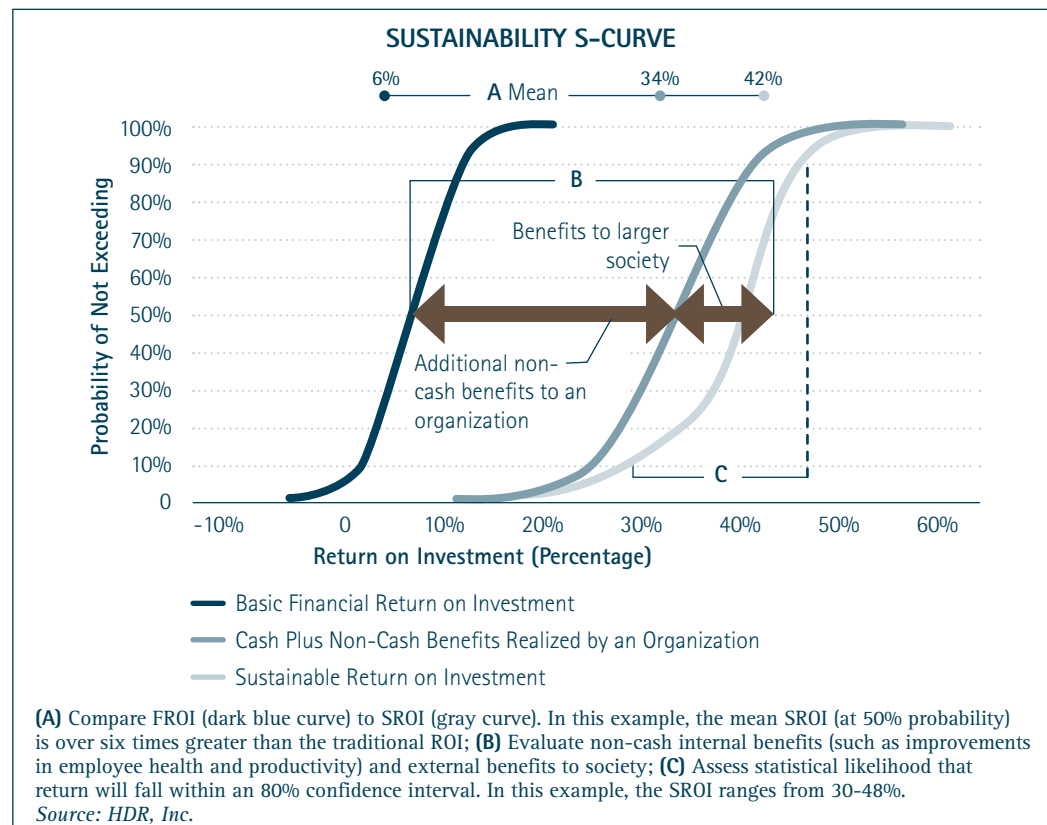
### RESOURCE OR TOOL

### DETAILS

**HDR, Inc.'s Sustainability ROI (SROI) Model**

Impressive methodology to monetize all potential **internal and external** sustainability-related costs and benefits for ROI analysis and project evaluation. HDR, Inc.'s Sustainability ROI (SROI) Model

HDR, Inc., a large international architectural, engineering and consulting organization, developed the SROI model to measure the financial value of social, environmental and economic impacts of projects or programs aimed at the sustainability triple bottom line. The SROI model helps both public and private sector decision makers evaluate projects competing for limited funding. Its approach draws heavily on stakeholder input, which lends credibility to the controversial process of assigning monetary values and assessing probability associated with key variables.



The example above shows how a standard financial ROI valuation would not reflect full impacts and benefits. The difference between the values shown for the financial ROI (the blue curve) and the sus-

## B. MODELS FOR ROI ANALYSIS & PROJECT EVALUATION *(continued)*

RESOURCE OR TOOL	DETAILS
<p><b>HDR, Inc.'s Sustainability ROI (SROI) Model</b> <i>(continued)</i></p>	<p>tainable ROI (the gray curve) is the value of "green."</p> <p>The SROI approach consists of the following steps:</p> <ol style="list-style-type: none"> <li><b>1. Identify all potential cash benefits</b> using life cycle costing, then calculate a financial return on investment (FROI).</li> <li><b>2. Identify all potential non-cash benefits to a company and external benefits to society,</b> using structure and logic maps to reveal all variables.</li> <li><b>3. Quantify inputs and assign a monetary value</b> to each, using the best-available third-party research, contingent valuation and other means.</li> <li><b>4. Assess statistical probability</b> of various outcomes and assign a probability distribution for each variable.</li> <li><b>5. Validate assumptions</b> with stakeholder groups and build consensus.</li> <li><b>6. Calculate the ROI</b> for a range of possible alternatives, using a Monte Carlo simulation to account for the various values and variables.</li> </ol> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>• See <a href="http://www.hdrinc.com">www.hdrinc.com</a></li> <li>• Contact John F. Williams, SVP, HDR, Inc., at <a href="mailto:john.williams@hdrinc.com">john.williams@hdrinc.com</a></li> </ul>
<p><b>Bob Willard Sustainability Advantage Worksheets</b></p> <p>Simple and practical recommendations and worksheets to help you monetize <b>internal</b> costs and benefits that could factor into ROI calculations of proposed sustainability efforts.</p>	<p>Bob Willard, a 35-year veteran of IBM, offers practical recommendations and tools for monetizing green costs and benefits in <i>The Sustainability Advantage: Seven Business Case Benefits of a Triple Bottom Line</i> (2002).</p> <p>Willard uses a hypothetical Fortune 500 computer company (a composite of IBM, Hewlett-Packard, Compaq, Dell and Xerox) to show how a company can monetize the benefits of eco-efforts, leading to:</p> <ul style="list-style-type: none"> <li>• Easier hiring of top talent</li> <li>• Greater retention of top talent</li> <li>• Increased employee productivity</li> <li>• Reduced manufacturing expenses</li> <li>• Lowered expenses at commercial sites</li> <li>• Increased revenues and market share</li> <li>• Reduced risk, easier financing</li> </ul> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>• Book and electronic spreadsheets available at: <a href="http://www.sustainabilityadvantage.com/products/index.html">http://www.sustainabilityadvantage.com/products/index.html</a></li> </ul>
<p><b>True Impact Web-based ROI Calculator and Other Software Tools</b></p> <p>Web-based software that helps companies measure and monetize social, financial and environmental impacts <b>(internal and external)</b> of current or prospective programs.</p>	<p>True Impact provides Web-based software and consulting services to help companies measure and monetize their social, financial and environmental impacts. The True Impact software guides users through the following process:</p> <ol style="list-style-type: none"> <li><b>1. Identify stakeholders and brainstorm impacts.</b> The software prompts users to consider all the "potential ripple effects" of the program being analyzed and how these ripples might affect the bottom line. It helps users to identify relevant internal and external stakeholders that will be affected. And it provides checklists of possible bottom-line impacts (e.g., will the proposal increase or decrease administration expenses for the external affairs department?).</li> <li><b>2. Review results.</b> The software provides a preliminary assessment of impacts regarding (1) business results including general operations, sales, productivity, recruiting, retention, risk, satisfaction, skills, and cost of capital; and (2) social results including arts and culture, community and economy, education, environment, health and well-being, and other social issues.</li> </ol>

B. MODELS FOR ROI ANALYSIS & PROJECT EVALUATION *(continued)*

RESOURCE OR TOOL	DETAILS										
<p><b>True Impact Web-based ROI Calculator and Other Software Tools</b> <i>(continued)</i></p>	<p><b>3. Rate and measure.</b> The program asks users to assign a relative weight to each factor. It also provides calculators to help measure the value of specific impacts, encouraging users to add notes about assumptions or create reminders for data still needed.</p> <p><b>4. View ROI scorecard.</b> The software uses algorithms to generate bottom-line results. Users can review assumptions, compare results to other analyses and export data to Excel.</p> <p>Details and an online demonstration available at: <a href="http://www.trueimpact.com">www.trueimpact.com</a></p>										
<p><b>ORC Worldwide's Return on Health, Safety and Environmental Investments (ROHSEI) Method</b></p> <p>A method and software to help identify and quantify (not always monetarily) relevant <b>internal</b> costs and benefits for ROI analysis and project evaluation.</p>	<p>ROHSEI—an analytical process with supporting software—was designed to help occupational health, safety and environmental professionals develop business cases, and make capital and expense investment decisions involving competing safety, health and environmental scenarios. Consultancy ORC Worldwide developed ROHSEI with input from representatives of several Global 500 companies.</p> <p>ROHSEI uses a four-step approach:</p> <ol style="list-style-type: none"> <li><b>1. Understand the opportunity or challenge.</b> Users document the specific definition of the investment opportunity—i.e., the problem that needs to be addressed (e.g., unacceptable level of risk) and the nature of the opportunity (e.g., potential for reducing risk, cutting costs or increasing revenue).</li> <li><b>2. Identify and explore alternative solutions.</b> Users identify, prioritize and document all reasonable alternatives that could help to address the “objectives, requirements and constraints of the opportunity.”</li> <li><b>3. Gather data and conduct analysis.</b> Users explore, identify and analyze the direct and hidden costs and benefits for each alternative. Direct impacts (those that are easily quantified and clearly observable, such as health and safety personnel time, production downtime, usage of raw materials, and health and safety capital) are monetized. Hidden impacts (those that are hard to observe and to quantify, such as impacts on worker productivity, product quality and customer satisfaction) are translated into “semi-quantitative” values.</li> <li><b>4. Make a recommendation.</b> Users form a recommendation in light of findings and any additional criteria.<sup>16</sup></li> </ol> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>ROHSEI software, training and consulting services are available from ORC Worldwide. Details and a demonstration available at: <a href="http://www.orc-dc.com/?q=node/821">http://www.orc-dc.com/?q=node/821</a></li> </ul>										
<p><b>BP's Sustainability Assessment Model</b></p> <p>An approach to evaluate external sustainability costs and benefits of individual projects.</p>	<p>BP and Jan Bebbington developed the Sustainability Assessment Model (SAM) to evaluate the external social and environmental costs and benefits of projects. SAM takes the following approach:</p> <ol style="list-style-type: none"> <li><b>1. Define the cost objective</b> or project under consideration.</li> <li><b>2. Specify the scope</b> of the analysis.</li> <li><b>3. Identify the impacts</b> (economic, resource use, environmental and social), focusing on the most significant impacts.</li> <li><b>4. Translate impacts into dollars and cents.</b></li> </ol> <div data-bbox="834 1419 1520 1900" data-label="Figure"> <p><b>SAM SIGNATURE FOR A TYPICAL OIL AND GAS FIELD DEVELOPMENT</b></p> <table border="1"> <caption>SAM Signature Data (Estimated)</caption> <thead> <tr> <th>Category</th> <th>Impact Components (from top to bottom)</th> </tr> </thead> <tbody> <tr> <td>Social</td> <td>Dark Blue, Light Blue, Brown, Grey</td> </tr> <tr> <td>Environmental</td> <td>Dark Blue, Brown, Grey</td> </tr> <tr> <td>Resource</td> <td>Light Blue, Brown, Grey</td> </tr> <tr> <td>Economic</td> <td>Dark Blue, Light Blue, Brown, Grey</td> </tr> </tbody> </table> </div>	Category	Impact Components (from top to bottom)	Social	Dark Blue, Light Blue, Brown, Grey	Environmental	Dark Blue, Brown, Grey	Resource	Light Blue, Brown, Grey	Economic	Dark Blue, Light Blue, Brown, Grey
Category	Impact Components (from top to bottom)										
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## B. MODELS FOR ROI ANALYSIS & PROJECT EVALUATION *(continued)*

RESOURCE OR TOOL	DETAILS
<p><b>BP's Sustainability Assessment Model</b> <i>(continued)</i></p>	<p><b>5. Plot the project's SAM Signature</b> (see graph on previous page).</p> <p>SAM was first applied on an oil and gas field development project, which tracked impacts over the project's full life-cycle, including: exploration drilling; design, construction, installation and commissioning of required apparatus; oil and gas production; platform decommissioning; oil and gas refining; manufacture of products from oil and gas; and eventual product use.</p> <p>In a SAM Signature graphic, the bars above the horizontal line represent a net benefit for a category, the bars below represent a net cost. The various colors within each bar represent one element (e.g., the social bar's green portion could represent the economic impact of jobs).</p> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>• See Bebbington's <i>Accounting for Sustainable Development Performance</i>.</li> <li>• For an abridged description, see "BP sustainability assessment could blaze a trail" at: <a href="http://www.cimaglobal.com/cps/rde/xchg/live/root.xsl/Insight051888_2578.htm">http://www.cimaglobal.com/cps/rde/xchg/live/root.xsl/Insight051888_2578.htm</a></li> </ul>

## C. MONETIZING RISK

RESOURCE OR TOOL	DETAILS
<p><b>Mark J. Epstein's Making Sustainability Work Method for Risk Measurement and Valuation</b></p> <p>Method and worksheets to factor eco-related risks into ROI calculations.</p>	<p>In <i>Making Sustainability Work</i> (2008), Mark J. Epstein outlines the following approach to measuring risks and including them in ROI calculations:</p> <ol style="list-style-type: none"> <li>1. For the option being analyzed (e.g., making a new product with cheap but potentially harmful chemicals), <b>calculate the expected financial benefits</b> (e.g., the cost savings from using the cheap chemical instead of a more expensive green alternative). Calculate the net present value (NPV) of the benefits.</li> <li>2. <b>Identify the risks</b> that the decision could cause (e.g., a consumer boycott that harms sales, lowers stock price and forces you to hire a PR firm). Epstein describes tools to help identify and evaluate risks, including scenario-based methods, risk mapping and Monte Carlo simulations.</li> <li>3. <b>Calculate the costs</b> associated with each risk.</li> <li>4. <b>Estimate the probability</b> (in percentages) of each risk.</li> <li>5. <b>Calculate the expected value of each risk</b> by multiplying the estimated cost of each risk by the percent probability. Determine the NPV for each risk's expected value.</li> <li>6. <b>Aggregate NPVs</b>, and factor the results into traditional ROI calculations.</li> </ol> <p>Epstein's framework includes a series of worksheets with illustrative risks, costs and benefits.</p> <p><b>For more information:</b></p> <ul style="list-style-type: none"> <li>• See pp. 156-162 and 183-190 of <i>Making Sustainability Work</i>.</li> <li>• For an abridged version, see Bekefi and Epstein's "Measuring and Managing Social and Political Risk."</li> </ul>



## D. MONETIZING VALUE OF ECO TO BRAND

RESOURCE OR TOOL	DETAILS
<p><b>Interbrand</b></p> <p><b>Harris Annual RQ</b></p> <p><b>Boston College-Reputation Institute CSR Index</b></p> <p><b>Newsweek Green Reputation Survey Score</b></p> <p>No particular resource was found to help measure and monetize impact of eco-efforts to brand. However, these recommended resources may help your company to develop its own methodology.</p>	<p>Traditional financial reporting reflects only one slice of a company's true market capitalization. Twenty percent of Coca-Cola's market cap, for instance, can be attributed to its book value or hard assets—but 80 percent of its value is attributed to intangibles not captured in a financial statement, such as brand, R&amp;D, risk management, ability to innovate and more.<sup>17</sup> The amount by which a company's market value exceeds the liquidation value of its assets is sometimes referred to as its <b>reputational capital</b>.<sup>18</sup> Some studies have found that up to one-third of a company's reputational capital is based on social and environmental performance.<sup>19</sup> BT, for instance, credits one-fourth of its reputation with customers to its socially responsible activities.<sup>20</sup></p> <p>CEF research has uncovered no practical tools, however, specifically geared toward helping companies measure and monetize the impact of environmental activities or performance on brand. What follows are resources that may be helpful if your company is interested in developing its own methodology:</p> <ul style="list-style-type: none"> <li>• <b>Interbrand</b> has a brand valuation methodology that calculates the future earnings value attributable to a company's brand overall. It draws on analysts' projections, company financial documents, and its own qualitative and quantitative analysis to arrive at a net present value of future earnings. Interbrand is developing a new methodology to analyze the link between a company's corporate social responsibility (CSR) performance and its brand value. <b>See</b> <a href="http://www.interbrand.com/paper.aspx?paperid=77&amp;langid=1000">www.interbrand.com/paper.aspx?paperid=77&amp;langid=1000</a>.</li> <li>• <b>Harris Interactive Annual RQ (Reputation Quotient)</b> captures perceptions from stakeholders surveyed in six categories: products and services; financial performance; workplace environment; social responsibility; vision and leadership; and emotional appeal. <b>See</b> <a href="http://www.harrisinteractive.com/services/rq.asp">http://www.harrisinteractive.com/services/rq.asp</a>.</li> <li>• <b>The Boston College-Reputation Institute's CSR Index (CSRI)</b> measures the public's perceptions of a company's citizenship, governance and workplace practices from a representative sample of at least 100 local respondents familiar with the company. <b>See</b> <a href="http://www.reputationinstitute.com">www.reputationinstitute.com</a>.</li> <li>• <b>Newsweek's Green Rankings "Reputation Survey Score"</b> is based on an opinion survey of corporate social responsibility (CSR) professionals, academics and other environmental experts who subscribe to CorporateRegister.com. CEOs or high-ranking officials in all companies on the Newsweek 500 list were also invited to participate. <b>See</b> <a href="http://greenrankings-origin.newsweek.com/companies/category/reputation-survey-score">http://greenrankings-origin.newsweek.com/companies/category/reputation-survey-score</a>.</li> </ul>

## 4. CONSIDERING NON-FINANCIAL WAYS TO QUANTIFY COSTS & BENEFITS

Sometimes you won't have the time or resources to translate every cost and benefit into dollars and cents. Or you may conclude that even if you did others would reject the number as not credible. The following are techniques to generate other kinds of meaningful metrics that could support your case.

**A. Try a “weighted-criteria” approach to cost-benefit analyses.** The weighted-criteria method is one of the simplest and most common methods used by companies to integrate hard-to-quantify or non-financial criteria into traditional cost-benefit analyses. The basic approach is as follows:

1. Identify the criteria that should influence the decision (e.g., cost, potential to enhance community image);
2. Assign a numerical weight (e.g., on a scale of 1-10) to each criterion based on its relative importance;
3. Score each project for its potential to meet each criterion (e.g., on a scale of 1-100);
4. Multiple the weight times the score to get a value;
5. Add up the values to get a total numerical score for each competing project.

Northrop Grumman's ECO Model is one example of a successful effort to build on weighted-criteria techniques (see sidebar, page 21).

Today, if two projects with similar projected ROI are competing for limited capital investment dollars, the one with more eco-points is likely to win. If proposed projects get zero eco-points, they are subjected to intense scrutiny and risk being denied.

The secret to success seems to lie in its participatory origins and approach. The model got traction quickly because of the credibility and diversity of the individuals that created it. Project evaluation scores, though based heavily on qualitative judgments, are trusted because they rely on the assessment of many experts within the

company—not just on one office's opinion.

**B. Use performance indicators to reinforce the potential value of eco-efficiency measures.** The following are two examples of performance measures that show how efficiently your company is using critical resource inputs, such as energy, water or raw materials. These measures can help to underscore the value behind what you propose.

- **Return on Resources (ROR)** is the ratio of *profit, revenue or intended result to critical resource inputs*, showing how much money your organization makes—or how much output you produce—per unit of critical resources used. Gil Friend, CEO of Natural Logic, suggests that companies explore many kinds of ratios—e.g., profit per ton of raw material or units of product per pound of hazardous waste—to see which disclose meaningful patterns that help drive better decisions. Friend suggests putting the intended result in the numerator: This way, “the resulting ratio has the same ‘up is good’ directionality of most financial indicators like revenue, profit and market share, rather than the ‘down is good’ vector of most environmental indicators.”<sup>21</sup>
- **Product to Non-Product Ratio (P2NP)** is the ratio of productive output (the intended result you want to produce) to “non-product output” or NPO (the unintended or unwanted waste you can't sell or reuse), which provides a window into how wasteful your company is. It is calculated as follows:<sup>22</sup>

$$\frac{\text{(Finished product)}}{\text{(Finished Product + NPO)}}$$

Gil Friend claims this single metric is “one of the most powerful change drivers” he has seen. The result, he says, is “always far worse than companies estimate” and helps managers see that “producing NPO makes no business sense at all.”<sup>23</sup>

## THE EVOLUTION OF NORTHROP GRUMMAN'S ECO MODEL

In 2005, Northrop Grumman Corporate Program Director David Hitchings and his team set out to build a new cost-benefit analytical model that could accommodate eco-criteria alongside traditional ROI calculations. The company had already adjusted its ROI model to include true cash benefits typical to eco-projects that are often excluded from calculations—third-party incentives, government grants, tax credits, etc. It had also developed a way to estimate potential project cost savings associated with CO<sup>2</sup> reductions. The goal now was to create an expanded, credible framework to evaluate and communicate additional non-financial benefits of proposed environmental projects and initiatives.

Hitchings, a 21-year Northrop veteran, knew his efforts would be facilitated in part by the company's "balanced scorecard" culture: senior executives were already accustomed to looking beyond pure financial measures when making decisions about budgets, projects and capital expenditures. And they understood how "soft" factors—like the ability to recruit and retain top talent—mattered to shareholder value. Still, Hitchings recognized that many of his defense and aerospace industry peers might be skeptical.

The most effective approach, Hitchings concluded, would be to involve peers in the analytical process—to enlist them in the work to evaluate how environmental issues could positively or negatively affect business value. He invited an influential group of cross-functional executives (from business development, marketing, human resources, supply chain and more) to weigh in. First, he shared a draft checklist of the various eco-costs and benefits that might be added to traditional ROI models and cost-benefit analyses. Then he asked the team to help refine the checklist and devise a weighted points system based on their judgments about what mattered most.

The resulting "ECO Model" offers a credible, standardized way for decision makers to compare different projects' potential to add value beyond traditional ROI numbers. A cross-functional team assigns scores to projects based on their ability to advance key business objectives, including: employee attraction and retention; business development; customer satisfaction; corporate image and reputation; and voluntary corporate social responsibility (CSR) commitments.

Today, if two projects with similar projected ROI are competing for limited capital investment dollars, the one with more eco-points is likely to win. If proposed projects get zero eco-points, they are subjected to intense scrutiny and risk being denied.

The secret to success seems to lie in its participatory origins and approach. The model got traction quickly because of the credibility and diversity of the individuals that created it. Project evaluation scores, though based heavily on qualitative judgments, are trusted because they rely on the assessment of many experts within the company—not just on one office's opinion.

## 5. POINTING TO OTHER SUCCESS STORIES

Identify case examples of how your company or others have already generated bottom-line benefits from doing what you propose. As you proceed, keep in mind the following cautionary words of John O’Keefe, former

managing director of Limehouse Studios: “Citing what competitors are doing can be seen as disloyal, unless you keep it positive—‘we can do better.’”<sup>24</sup> What follows is a list of examples to get you started.

### ROI SUCCESS STORIES

Management consultancy A.T. Kearney found that companies with strong sustainability performance were outperforming peers during the financial crisis in early 2009.<sup>25</sup>

**3M’S 3P** (Pollution Prevention Pays) program has saved the company nearly \$1.2 billion based on aggregated data from the first year of each 3P project alone. The 3P program leverages the creativity of thousands of employees to prevent pollution at the source—in products and manufacturing processes—rather than removing it after it has been created.<sup>26</sup>

**BAXTER INTERNATIONAL** over the past decade has received an average return of approximately \$3 for every \$1 invested in its environmental initiatives, which it has documented on its annual *Environmental Financial Statement* of environmental costs and benefits.<sup>27</sup>

**CLOROX** announced in early 2009 that its Green Works line of plant-based cleaning materials, launched in early 2008, captured 42 percent of the natural cleaning products in its first year.<sup>28</sup>

**DOW’S** 1995–2005 sustainability goals enabled the company to earn a return of \$5 billion on an investment of \$1 billion in processes and technologies.<sup>29</sup>

**GE** earned \$17 billion in revenue in 2008 from “Ecomagination,” a company-wide effort to sell products that help solve global sustainability challenges. GE expects to earn \$25 billion a year from Ecomagination products by 2010.<sup>30</sup>

**IBM’S** \$1 million investment in green upgrades at a Kansas data center running at 100 percent capacity increased the center’s capacity eight-fold, which eliminated the need for the company to build a \$50 million new facility.<sup>31</sup>

**MITSUBISHI** plans to achieve sales of about \$13.3 billion by 2016 from clean technologies such as solar systems, heat pumps and other energy efficient power devices.<sup>32</sup>

**NORTHROP GRUMMAN** saved \$2 million in energy costs at a single facility by installing reflective roofs and fluorescent lighting, replacing old equipment, and making minor temperature and humidity-level adjustments.<sup>33</sup>

**PROCTER & GAMBLE** plans at least \$50 billion in cumulative sales of “sustainable innovation products” by 2012.<sup>34</sup>

**SONOCO** conducted waste audits in 34 North American plants and found more than 70,000 tons of recyclable scrap, opening up a revenue stream of \$770,000 in 2008.<sup>35</sup>

## 6. FINALIZING YOUR CASE

**A. Test and refine your assumptions.** Numbers are only as good as the assumptions behind them. Make sure yours can be trusted so your reputation remains solid. Carefully assess the potential for downside risks (technical, cost, operational, market, circumstantial) and be prepared to explain their probability and how they can be mitigated or controlled. Run sensitivity analyses to assess the worst-case and best-case scenarios. If any of the worst-case scenarios gives too low of an internal rate of return, consider the probability for that risk and decide whether to proceed.<sup>36</sup>

**B. Bring your data and arguments to life.** One of the biggest mistakes made by communicators is to assume that the facts will be enough to win over audiences. The people you're trying to convince are not only busy executives barraged with requests for their time and resources—they're also human. Never underestimate the simple power of a good story, anecdote or visual in communications to drive your point home. Think back to presentations that made an impact on you: What, besides spreadsheets and words on a slide deck, made

them effective? Did the presenter show a short video clip that made the issues more real (see this [2-minute video, Hunt for CO<sub>2</sub>](#), on GE's "treasure hunts" for example)? Did he invoke a familiar adage or proverb that gave the argument personal meaning? Used sparingly, such techniques will not only help your ideas stand out; they will also help to change the lens of skeptics, forcing them to think and appreciate the risks and opportunities presented.

**C. Consider adding credible external voices to the mix.** Sometimes a fresh voice from the outside can make all the difference. Ask yourself which messengers from outside your company could help persuade your audience. Would a world-renowned scientist or subject matter expert help lend credibility to your arguments? Would it impress your colleagues if a senior executive from another respected company shared a case study on how they benefited from actions similar to what you propose? What if a top customer outlined its environmental priorities and expectations for your company and your competitors?

### HIGHLY-RECOMMENDED GUIDES TO MAKING YOUR BUSINESS CASE

Carbon Trust's *Making the Business Case for a Carbon Reduction Project: How to Win Over the Board and Influence People* (2009)

This excellent guide is designed to "help you ensure that your projects for cutting energy costs and reducing carbon emissions get a fair hearing and the best possible chance of implementation." The guide includes practical recommendations for anticipating what decision makers will be looking for, gathering data and evidence, building the case (including considerations of finance and risk), drafting and presenting the proposal, and keeping momentum.

The guide features a number of best-practice checklists and an annex that explains key financial evaluation techniques and concepts, including simple payback, discounted cash flow, net present value and internal rate of return.

**For free download and related tools:** [www.carbontrust.co.uk/default.ct](http://www.carbontrust.co.uk/default.ct)

Sustainability Purchasing Network's *Guide to the Business Case and Benefits of Sustainability Purchasing* (2007)

This 2007 guide outlines the financial, social and environmental costs and benefits of sustainability purchasing. It also reviews "important process considerations that impact the business case, such as the cost of designing and managing a sustainability purchasing program and the benefits of using 'total cost of ownership' or life-cycle assessment processes in purchasing."

**For free download and related tools:** [www.buysmartbc.com/spn-resources/tools.html](http://www.buysmartbc.com/spn-resources/tools.html)

**D. Try a portfolio approach.** If some of your proposed projects are likely to be rejected because they do not meet existing hurdle rates, consider “pairing” or “bundling” them with other high-ROI projects, proposing a portfolio of projects with an attractive overall return. GE, for instance, calculated one overall rate of return for a portfolio of 60 retrofit projects: Some sites wouldn’t have met GE’s two-year payback hurdle, but the portfolio approach enabled executives to justify the effort and meet their objective of division-wide change. As Esty and Winston put it in *Green to Gold*: “By breaking even overall, managers reap the intangible upside benefits—bragging rights with shareholders, enhanced brand and intangible value, and happier employees—at no extra cost.”<sup>37</sup>

**E. When appropriate, challenge others’ assumptions.** The numbers in financial forecasts and projections are only as good as the assumptions behind them. Don’t assume others’ numbers are any better than yours. Ask the same kinds of questions you would ask of yourself when conducting a sensitivity analysis. Strict adherence to hurdle rates can lead to shortsighted decisions. If your company refuses to make exceptions, consider pointing to the benefits accrued to other companies (particularly competitors) that have occasionally lowered hurdle rates for farsighted projects with long-term benefits. For instance, Unilever’s capital investment process “requires an environmental profile of an investment, which may trigger a lower hurdle rate.”<sup>38</sup> 3M has cut its standard 30 percent hurdle rate to 10 percent for its highly successful Pollution Prevention Pays projects.<sup>39</sup> As Esty and Winston note: “The business logic of these choices is sound. Indeed, it’s the traditional business tools that ignore key costs and benefits.”<sup>40</sup>

“In tough economic times, when every aspect of our business is under scrutiny, some might ask whether we can afford to focus on sustainability. To that I respond: Can we afford not to?”

–Jim Rogers, Chairman, President and CEO of Duke Energy

When opponents say, “We can’t afford to make this investment,” consider countering with the argument that “we can’t afford *not* to make the investment”—if you indeed believe that to be true. According to Harvard professor Clayton Christensen, “discounted cash flow and net present value, as commonly used, underestimate the real returns and benefits of proceeding with an investment.” The numbers behind projects against which yours is being judged often make faulty straight-line projections about future cash flows from current trends—assuming, for example, that present health of company will persist if the company doesn’t change direction or make the kind of investments you advocate. As Christensen writes, however: “In most situations ... competitors’ sustaining and disruptive investments over time result in price and margin pressure, technology changes, market share losses, sales volume decreases, and a declining stock price. [T]he most likely stream of cash for the company in the do-nothing scenario is not a continuation of the status quo. It is a nonlinear decline in performance.”<sup>41</sup>

#### DID YOU FIND THIS REPORT HELPFUL?

Do you know of additional resources and tools in this area? Ideas for how Corporate Eco Forum could build on these findings at the 2010 Annual Meeting?

Please help CEF advance this work by taking a [3- to 5-minute online survey](#).



## ENDNOTES

- <sup>1</sup> For a review of low-hanging fruit opportunities, see Winston.
- <sup>2</sup> Leahy.
- <sup>3</sup> International Federation of Accountants (IFAC), p. 30.
- <sup>4</sup> Ibid.
- <sup>5</sup> Motiva Oy.
- <sup>6</sup> United Nations Division for Sustainable Development. *Environmental Management Accounting, Procedures and Principles*, p. 14.
- <sup>7</sup> International Federation of Accountants (IFAC), pp. 30-31
- <sup>8</sup> Ibid, p. 31.
- <sup>9</sup> Motiva Oy.
- <sup>10</sup> EPA, *An Introduction to Environmental Accounting As a Business Management Tool: Key Concepts and Terms*, p. 7.
- <sup>11</sup> IFAC, p. 17
- <sup>12</sup> EPA, p. 31
- <sup>13</sup> Blackburn, pp. 36-109.
- <sup>14</sup> Hitchcock & Willard, p. 217.
- <sup>15</sup> AIChE pp. 3-9 ; Laurin, Lise, Norris, Trupia.
- <sup>16</sup> Linhard, p. 258.
- <sup>17</sup> Slater, p. 32.
- <sup>18</sup> Epstein, *Making Sustainability Work*, pp. 180-182.
- <sup>18</sup> Blackburn, p. 39, 42.
- <sup>20</sup> Ibid, p. 42.
- <sup>21</sup> Friend, "Key Sustainability KPIs: the simple, the sobering, the significant."
- <sup>22</sup> See an example at: <http://www.stepsforward.org.uk/rf/emissions.htm>
- <sup>23</sup> Friend, "Key Sustainability KPIs: the simple, the sobering, the significant."
- <sup>24</sup> Carbon Trust, p. 11.
- <sup>25</sup> Kearney.
- <sup>26</sup> 3M.
- <sup>27</sup> Baxter.
- <sup>28</sup> Sustainable Life Media.
- <sup>29</sup> Dow Chemical Company.
- <sup>30</sup> Immelt & Fludder.
- <sup>31</sup> GreenerComputing Staff.
- <sup>32</sup> Mitsubishi.
- <sup>33</sup> Northrop Grumman, p. 55.
- <sup>34</sup> Procter & Gamble.
- <sup>35</sup> GreenBiz Staff.
- <sup>36</sup> Carbon Trust, p. 23.
- <sup>37</sup> Esty & Winston, p. 214.
- <sup>38</sup> Ibid., p. 212.
- <sup>39</sup> Ibid.
- <sup>40</sup> Ibid., p. 213.
- <sup>41</sup> Christensen, Kaufman, & Shih.

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### **M.R. Rangaswami, Founder, Corporate Eco Forum**

M.R. Rangaswami is the founder of the Corporate Eco Forum. His objective is to be a catalyst for Global 500 corporate executives to aggressively challenge and advocate eco-strategies. M.R. intends to bring the same energy and enthusiasm in this emerging space as he has in his career as a 25-year veteran of the software and technology industry and cofounder of the Sand Hill Group. M.R. has been an active participant in the meteoric growth and success of the enterprise software business, including executive positions with Oracle and Baan. As host of the largest and most prestigious software executive conferences, M.R. tackled the industry's pressing issues and helped further the industry's vision. As publisher of the prestigious SandHill.com website, M.R. has brought a unique perspective to the trade media and established a reputation as both a critic and an enthusiast. Contact M.R. at [mr@sandhill.com](mailto:mr@sandhill.com).

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