The Role of Metrics in Sustainable Development: A Progress Report

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Companies that have embarked on sustainable development initiatives recognize that measuring progress is critical to success. Companies such as British Petroleum, IKEA, Interface, and Royal Dutch/Shell are exploring not only why and how to reach sustainable development goals, but also how to calibrate how well they are doing. The challenge is that, for many facets of sustainable development, there is no agreed-upon context or consensus for measurement. When a company sets its sights on increasing profits 28 percent in the coming year, everyone involved knows what that metric means and why it's important. But how does a company measure its progress in supporting the well-being of a local community in a developing country? What environmental, economic, and social metrics should a company draw on to develop a state-of-the-art manufacturing plant in a new region, or to change how it transports goods both internally and externally? Will old measures suffice? Can a few simple measures capture the three dimensions of sustainable development – economic success, environmental quality, and social equity – and provide management with valuable decision-making tools?

Answers to these questions don't come readily. And measuring is further complicated by the need to address the concerns of many stakeholders with different needs and priorities. Fortunately, however, some leading companies have undertaken, on their own or in industry partnerships, to develop and test indicators and metrics for all three dimensions of sustainable development. At the same time, organizations such as the United Nations Environmental Program (UNEP), the World Business Council for Sustainable Development (WBCSD), the International Organization for Standardization (ISO), and the Coalition for Responsible Economies (CERES) are providing valuable assistance.

These first steps help define how companies can tackle sustainable development measurement. The ideal metrics will be those that consolidate progress across all three dimensions of sustainable development. Those involved are still working toward measures that fully stand up to scrutiny and comparison in the environmental and social dimensions. In this article, we offer a framework, based on the efforts of leading companies, for breaking down the measurement challenge into manageable components. We review progress so far on metrics in the two newer dimensions. And we provide guidance on the next steps companies can take in this important area.

New Territory, New Approach

We define three components of sustainable development measurement systems as sensing, measuring, and signaling. These three components align with the pathway to sustainable development introduced on page 7 of this issue of *Prism* (Exhibit 1).

Sensing. A company can define a sense of direction by understanding the context of sustainable development: what it means for the company vis-a-vis its strategy, its stakeholders and competitors, and its current performance and objectives. For example, as Royal Dutch/Shell set out to rethink its principles and practices in the areas of social equity and environmental quality, the company gauged public opinion through stakeholder dialogue with employees, governments, host communities, and nongovernmental organizations (NGOs), among others. This „sensing" exercise provided Shell with a reading of its stakeholders' expectations, later addressed in „The Shell Report 1998: Profits and Principles – Does There Have to Be a Choice?" The exercise helped Shell determine its context and path to sustainable development.

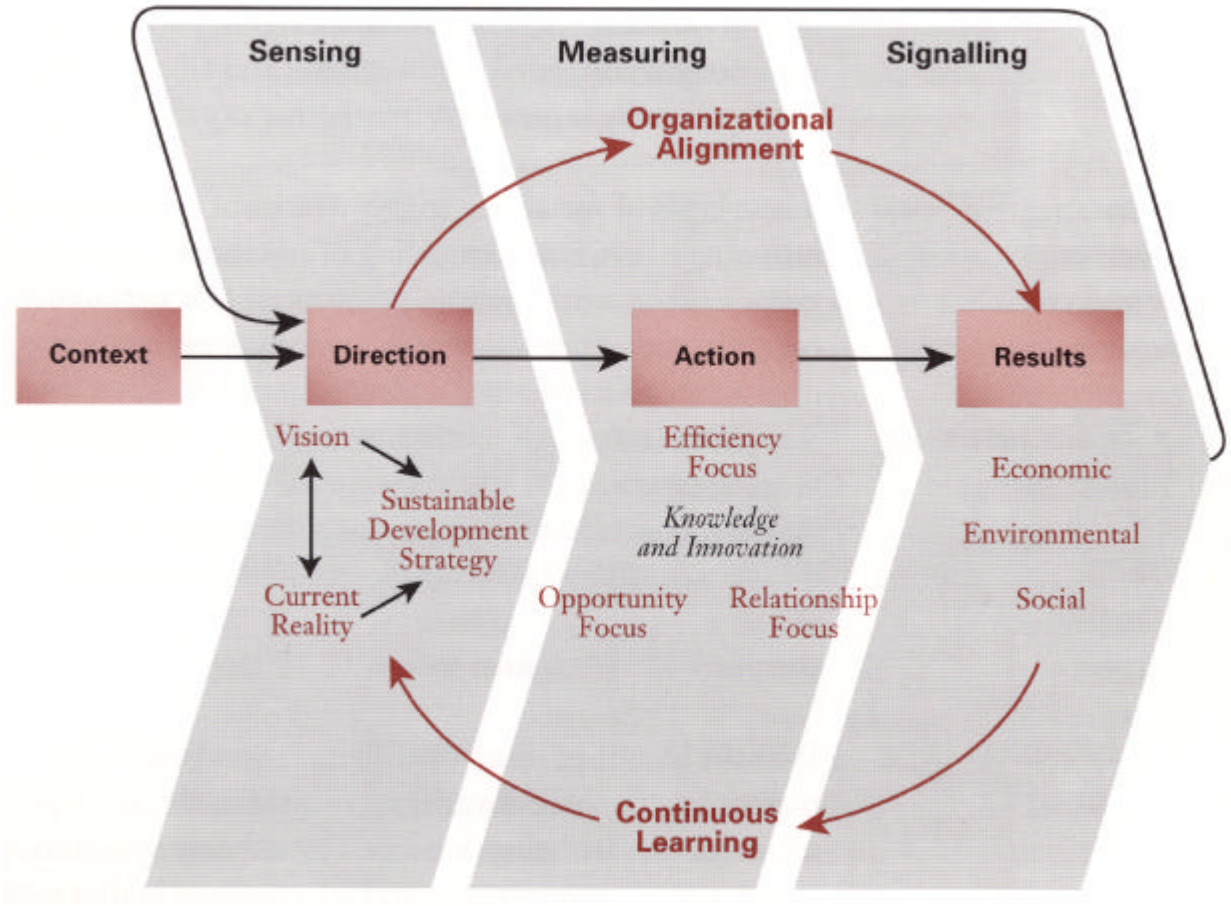
Similarly, as Unilever set out to establish a companywide vision of sustainable development, it sought to learn more about the impact of its organization. Unilever began to explore broad questions such as: What is our place in the global economy? What is our impact on the global environment? As a first step, the company conducted a comprehensive global environmental footprint exercise, from which it developed a set of imperatives for managing its use and conservation of fisheries resources.

Both of these companies were exploring new territory opened up by sustainable development thinking. By using sensing tools such as activity mapping, impact assessment, stakeholder dialogue and consultation mechanisms, and assessment of staff and organizational alignment, a company can define its current position relative to where it wants to be and link it to its core purpose.

Measuring. Once context and direction are understood, the next step is to clearly define goals and choose specific measurements of progress. The latter include both new tools and familiar ones in new applications such as ecoefficiency metrics, total cost assessment, life cycle assessment, and value assessment. Much progress has been made very recently on specific metrics, which we examine in detail in the next section of this article.

Exhibit 1

Metrics and the Sustainable Developmen Pathway



Signaling. A company sends signals to customers, stockholders, employees, and other stakeholders, such as community leaders and financiers, to obtain feedback about business, environmental, and social progress and to maintain its license to operate, innovate, and grow. Signaling often takes the form of extemal reporting about performance indicators and metrics. Traditional annual financial reports and accounts have been followed in recent years by increasingly sophisticated environmental reports. Now social reports are emerging. Other signaling tools include speeches by company leaders, dialogue tools such as those used in „sensing," benchmarking methods, partnering with nongovernmental organizations, and alliances with (or occasionally separations from) other organizations.

These kinds of signals can trigger a range of consequences, including a better understanding of stakeholder expectations, a stronger competitive position, or new partnering opportunities. They also enable a company to significantly improve its awareness and understanding of business risks. A continuous cycle of sensing, measuring, and signaling helps an organization set the course for sustainable development, understand progress along the way, and work side by side with stakeholders for a profitable passage.

Current Metrics and What They Do

We have identified more than 70 initiatives to develop metrics for the three dimensions of sustainable development. Metrics are being developed by industry associations, communities, governments, and international bodies such as the Organization for Economic Cooperation and Development (OECD). Within industry associations, specialized metrics are being developed for different sectors such as electronics and agriculture. Arthur D. Little has been working with the American Institute of Chemical Engineers' Center for Waste Reduction Technologies Focus Group on Sustainability Metrics. This group of 15 multinational organizations is evaluating a range of metrics to understand their suitability for helping corporations change their behavior to ensure sustainable industrial operations. In this connection, ADL has reviewed work from nongovernmental organizations such as the World Resources Institute and the Environmental Defense Fund, supranational organizations such as the

OECD and UN. agencies, and business organizations such as the WBCSD, as well as private companies. The WBCSD, in particular, has offered some useful thoughts on what makes a good metric (Exhibit 2). These efforts focus primarily on two areas: eco-efficiency metrics and social metrics (where the most work remains to be done).

Exhibit 2

What Makes a Good Metric?

The WBCSD has proposed that metrics should:

• Be relevant and meaningful with respect to protecting the environment and human health and/or improving the quality of life

Inform decision-making to improve the performance of the organization Recognize the inherent diversity of business Be conducive to benchmarking and monitoring over time Be clearly defined, measurable, transparent, and verifiable Be understandable and meaningful to identified stakeholders Be based on an overall (holistic) evaluation of the organization, with a minimum baseline in those areas of direct management control; issues related to upstream (e.g., suppliers) and downstream aspects (e.g., use) of operations or products should also be considered

Other resources on the elements of sound metrics include the following web documents:

• „Evaluating the Environmental Impact of Products and Production Processes“: *http://greenmfg.me.berkeley.edu/green/papers/96papers/methocls.html*

• International Institute for Sustainable Development (IISD): *http://iisdl.iised.ca/contents.htinl*

• Sustainable Development Indicator Inventory: *http://vww.hq.nasa.gov/iwgsdi/Can SDI List.html*

• United Nations Department for Policy Coordination and Sustainable Development: *http://www.un.arg/dpcsd/dsd/*

Eco-Efficiency Metrics

Intense effort has been devoted in recent years to developing workable eco-efficiency metrics, which provide a way to measure across the economic and environmental dimensions of the sustainable development framework. hi general, most of the organizations developing metrics for sustainability include metrics on energy (often in association with global warming) and material intensity, waste, and air pollution. Surprisingly few metrics deal with pollutant discharges to the water or land. Efforts to capture recyclability, service intensity of products, product durability, or end-of-life options (such as product takeback and reuse) are concentrated among companies in the vehicle and consumer goods sectors. Almost all the metrics are for industrial organizations; only one addresses services.

Progress Toward Standardization. Four organizations, in particular, are working to standardize reporting categories, indicators, and metrics: ISO, with ISO 14031; CERES, with the Global Reporting Initiative for environmental measurement in sustainability reporting; the WBCSD, with cross-cutting metrics; and the Canadian National Roundtable on the Economy and Environment (NRTEE), with a set of nine metrics in the categories of mass, energy, and toxic dispersion. The WBCSD Working Group on Eco-Efficiency Metrics is working to achieve a level of harmonization among these four groups while monitoring advances in others. The aim is to have a standardized set of metrics for pilot testing by members in the second quarter of 1999.

In this period of rapid development, the best approach for most companies is to carefully map, between now and mid-1999, how their activities bear upon the seven-point agenda of eco-efficiency, then shop around among the metrics being proposed to see which best suit their situations. An essential ingredient in selection is consultation with each firm's stakeholders, especially major stakeholder blocks (such as pension funds), lenders, insurers, stock analysts in your sector, and relevant NGOs. The choice is a serious one; once you start to measure something and report it externally, it can be hard to stop.

Social Equity Metrics

As they develop, social equity metrics could potentially address many issues. The declaration from the 1992 Earth Summit in Rio de Janeiro defined the social goal as „eradicating poverty and reducing disparities in living standards.“ Respect for human rights, the creation and maintenance of labor standards, and attention to quality of life for employees and host communities in both the developed and developing worlds are among the concerns addressed under the aegis of social responsibility. Exhibit 3 compares elements of several existing approaches.

Some companies have created philanthropic endeavors to address certain aspects of these global social issues, but the leading companies have moved well beyond philanthropy alone. Now, they see the social impact of their operations as a key area of business performance where competitive advantage can be won or lost, and risks managed or mismanaged. They have recognized that stakeholders demand accountability for social behavior, and that alleged corporate irresponsibility will be penalized in the marketplace, as Shell's Nigeria experience showed. Shell, BP, and Rio Tinto have introduced explicit recognition of human rights as a business concern in their codes of operation, while in the United Kingdom, BT, the telecommunications firm, attracted much attention by announcing its intention to produce a social audit.

A common feature of several initiatives in corporate social equity is a focus on developing-country suppliers to multinationals, typically in the toy, sporting goods, and apparel industries. The experience of Nike and Reebok is well known, and retailers such as C&A and IKEA have also felt the heat of criticism. These companies have valuable brands to protect. Marketing departments and corporate communications consultants have well-established methods for understanding and measuring what people think of a company and a brand, and for probing how they form these perceptions. Metrics such as these can help focus management on the importance of social issues and point to action that can help protect and enhance the company's reputation. Examples include the withdrawal of Carlsberg, Heineken, Pepsi Cola, and others from Myanmar (Burma), in response to its repressive regime.

Exhibit 3

Sample Frameworks for Social Equity Measures

Global/Government Focus		Industry/Service Focus	
World Summit for Social Development[2]	The President's Council on Sustainable Development (U.S.)	The Council on Economic Priorities' Social Accountability Standards	The World Resources Institute
• Providing primary health care globally	• Economic prosperity	• Child labor	• Employment
• Eliminating severe malnutrition	• Equity (income trends, environmental equity, social equity)	• Forced labor	• Community relations
• Ensuring family planning services for all willing couples	• Sustainable communities (economic vitality, safety, open space, etc.)	• Health and safety	• Ethical sourcing
• Providing safe drinking water and sanitation globally	• Population (growth, status of women, unintended pregnancies)	• Freedom of association and the right to collective bargaining	• Social impact of products
• Making credit available for all	• International responsibilities	• Discrimination	
	• Education (access, standards, community participation)	• Disciplinary practice	
		• Working hours	
		• Compensation	
		• Management systems (including outside communications)	

Other groups weighing in on defining corporate social performance categories, indicators, and metrics: The Fairtrade Foundation, the U.S. Government (Model Business Principles), and the European Caux Round Table (Business Principles). The WBCSD has a working group on Corporate Social Responsibility that is exploring what it means in practice through a series of stakeholder dialogues.

There is much to be done before an international (or even national) consensus emerges on social equity metrics. Whatever consensus emerges, social metrics will likely never become as standardized as economic or environmental metrics. It is likely that there will be a core set of social metrics with additional metrics to capture cultural and geographic influences.

Lessons from the Field

At this point, no company has a measurement system that covers all aspects of sustainable development. For examples that help illuminate the way forward, it is currently most useful to look at eco-efficiency, which brings together two of sustainable development's three elements.

Severn Trent is one company that has chosen to think beyond traditional compliance measurement, building on ideas of product stewardship and environmental leadership. With annual revenues of £1.3 billion, Severn Trent is a supplier of water, sewage treatment, and solid waste management services in the United Kingdom and elsewhere. *As* an organization born out of the massive privatization of services, Severn Trent realized that innovative thinking would be critical to its success. Seeing potential in the sustainable development agenda, Severn Trent identified aspects of its operations that map to that agenda. The most important measures in use at present are: group electricity consumption in gigawatts by business unit; non-fossil fuel electricity generation in megawatts; group use of vehicle fuel by fuel type and business unit in kilotons; distance traveled by vehicles by business unit; group net methane emissions in kilotons; and group carbon dioxide emissions in kilotons.

Severn Trent found that management had grown used to and accepted costs of electricity and transport. When the data were presented as specific numbers, however, they were shocked at how big they were – and were certain they could be reduced. For example, employees were driving 71 million miles per year while at work. Each mile not driven is about $1.50 saved and reduces emissions of CO2, NOx, hydrocarbons, and particulates to the atmosphere. The link to the bottom line was clear, and managers enlisted to support reductions in employee miles. The rest of the staff became enthusiastic about reducing the company's impact on the environment. At Severn Trent's extensive sewage works, staff used to drive around the sites. Now they often bicycle. Beyond the plant gate, management is defining financial incentives to reduce non-essential mileage. The company is studying staff commuting needs and examining roles it could play in reducing commuting travel.

Severn Trent has also seen significant reduction in electricity use. A measurement effort led to companywide management of electricity consumption and the ability to effectively prioritize reduction efforts. Electricity consumption is now being managed companywide and the data collected are showing where to focus the reduction efforts. Benchmarking the programs of other companies with comparable energy needs or uses helps to show what techniques can be used.

One secret of Severn Trent's success has been to keep the measures simple. Jim Oatridge, Director of Environmental and Corporate Controls, notes that, „The metrics are a great help in enabling us to focus on the key contributors and drop other issues which have low significance. Equally important, while the corporate center plays a role in initiation and showing a clear line on top-level objectives, the action has to happen at the operating level."

The ABB Group, a global engineering company with annual revenues of $35 billion and 213,000 employees, has structured its sustainable development efforts around three areas: developing and supplying eco-efficient products and systems, transferring state-of-the-art technology to developing countries, and continuously improving its environmental performance. ABB'S basis for measurement is the Draft Standard ISO 14031 for Environmental Performance Measurement. „Seventy-five countries support ISO," says Jan Strömblad, Senior Vice President, Environmental Affairs. „It is the only practical way forward, if we are to have comparative measures among companies and sectors." ISO 14031 specifies three types of measurement: management performance indicators, which measure management effectiveness in influencing an organization's environmental performance; operational performance indicators, which measure an organization's environmental performance; and environmental condition indicators, which provide information on the state of the environment to help an organization understand the impacts of its activities. ABB is using indicators from all three categories. In the area of operational performance, for example, the company tracks energy consumption in gigawatt hours broken down by global region and in megawatt hours per employee. For each metric, the company sets an annual target, which individual sites, and their heads, are responsible for meeting. Jan Strömblad sees several benefits from the approach. First, these metrics work well at the facility level by measuring an unambiguous characteristic. „Aggregated, high-level indexes mixing in different things are completely misleading. The value is in providing a management tool at the manufacturing site." Moreover, the corporate center can make comparisons between different sites doing the same things and offer guidance for cross-business learning and adoption. Finally, Strömblad sees both environmental impacts and costs being driven down simultaneously. ABB anticipates that total savings from the program in the five-year period from 1996 to 2000 will total 15 million Swedish Krona (almost $2 million US dollars).

ABB is also looking beyond its manufacturing activities to understand environmental impacts during the working life of its machines – the source, in fact, of the majority of their impacts. The company is using life cycle assessments to better understand this issue and setting targets for designers to reduce impact during product use. It's likely that, in doing so, the company will be creating benefits and savings for its customers as well through more efficient products.

Sulzer, an engineering manufacturer based in Switzerland, uses eco-efficiency measurement as a management tool at site level and for communicating information now being requested by the financial community. Sulzer standardizes all data on a per-employee basis, as well as per „value added." The per-employee data is used as the management tool to drive down use of energy and water, as well as solid waste generation. „The goal is to manage for stable or declining values on a corporate and plant level," says Peter Gebhardt, head of Corporate Quality and Environment. „This goal is very ambitious, as it means that environmental gains will at least meet gains in productivity achieved."

Sulzer sees several advantages in measuring progress on a per-employee basis. For example, measuring units for energy, water, and waste are clear and constant, as the number of people working on site are tracked and already reported. The data are also highly transparent because they aren't affected by factors such as changing exchange rates, inflation, and intercompany transfer prices. Moreover, the system responds to changes such as the outsourcing of manufacturing, hi contrast, standardization by sales volume would lead to decreasing, but false, values. Finally, the approach can be used to indicate progress over time and compare sites conducting similar activities while keeping data collection and analysis costs to a minimum.

Like ABB, Severn Trent, and Sulzer, Fiat Auto, the global automobile manufacturer based in Italy, has chosen to address a manageable portion of the total sustainable development area in its measurement and change efforts. All of these companies realize that to build credibility and support internally and externally for the new approach, they need to show steady progress along recognizable fronts. Fiat Auto is taking a two-pronged approach to measurement and change, addressing manufacturing issues with one set of metrics and product life cycle impacts with another. On the manufacturing side, Fiat's indices include:

• Specific energy consumption in equivalent tons of oil per billion lire of manufacturing cost

• Water recirculation index (the ratio of total recirculated water used in the manufacturing process to the total water requirements x 100 expressed as a percentage)

• Specific water consumption: the total water metered at the intake in meters^3 per million lire of manufacturing cost

• Specific waste generation: tons of waste (nonrecycled) per billion lire of manufacturing costs

• Solid waste recycling index, the ratio of recycled waste in tons to the total quantity of waste generated during manufacturing x 100 (expressed as a percentage)

Fiat Auto uses these data to make comparisons among countries, operating sectors, and types of process, to communicate and spread best practices, identify where R&D effort is needed to discover new and more efficient methods, and report progress both internally and externally.

The highest environmental impact of most products occurs when they are in use. To address in-use impact, Fiat Auto has devised a plan for new product development that will explore weight reduction, improved aerodynamics, lower roll resistance, higher efficiency engines/transmissions, direct injection for both gasoline and diesel, and alternative propulsion systems. The overriding goal of this effort is to reduce the products' use of fossil fuel in order to reduce CO2 emissions. Steady reductions in other emissions will also be achieved.

Other companies, such as Electrolux, Electrowatt, General Motors, Novo Nordisk, Roche, and Tepco, are all working with their own eco-efficiency metrics to improve customer service and investor return. In our talks with companies in the vanguard of this effort, we have identified several useful lessons about implementing metrics:

• The real benefits come from putting tools in the hands of people at the factory/plant level to optimize their operations

• The tools (the units of measurement, the metrics) must be simple – exhibiting clear meaning, straightforward to collect, and with an obvious link to behavior

• The corporate center can use the results for cross-business learning and cross-business management

• The data themselves change the way management views the issues.

How to Begin

It's clear that arriving at a manageable set of sustainable development metrics is a tough task. At Arthur D. Little, we advise companies to follow a simple sequence and to build on progress in each of the three dimensions.

Start by making your own values and aspirations clear and confirming top management commitment to them. Leadership from the top is essential if social and environmental goals are to be taken seriously. Once such goals are in place, measurement of performance against them can drive real change.

Identify your key internal and external stakeholders and listen to them through genuine two-way dialogue. Many companies now ask their stakeholders for their opinions on selected topical issues. A few companies invite stakeholders to suggest which issues should come under the spotlight. A handful have let stakeholders influence how the company will track performance against aspiration – in other words, the selection of metrics.

Taking stakeholder views into account, focus on the issues that are really key – those that touch on core aspects of business operation or that really excite and engage the attention of key stakeholders. If some of the issues are contentious – the health impacts of a product, for example, or an investment in a repressive country – face up to them: ignoring such issues and keeping to „safe" topics could compromise the credibility of your effort.

Choose metrics that are as objective and simple as possible, that focus directly on these key issues, and that are practicable, using existing sources of information and measurement processes. For example, one of the areas of concern to multinationals is respect for human rights in emerging and developing countries. Nongovernmental organizations point to the behavior of security personnel as a top issue. A good metric, in this context, would be one that relates directly to this behavior and links it to an objective standard, such as the percentage of company or contractor security staff who have been trained in accordance with the relevant United Nations guidelines. Ensure that the overall set of metrics is small and balanced, with input, output, and impact indicators, and quantitative and qualitative indicators. In addition, try to balance some „threshold" indicators (those that are not going to 'wow' stakeholders but are objective and auditable enough to confer credibility on the report) with „excitement" indicators (those that may be less readily quantifiable, but that go to the heart of stakeholder concerns – such as the level of access to education or health care in a country where a multinational has large operations, or the company's success in promoting freedom of speech in a country known for human rights violations).

Consider getting an independent view. Many companies find it valuable to open their measurement systems and data to external verification. In the social and environmental arenas, as in the financial, this can add significantly to the impact and credibility of a public report. Taking the security staff example, a verifier might examine training records of security staff and instructional materials, or interview a sample of security officers to see how many demonstrate a knowledge of the required standard of conduct.

In addition to gathering internal metrics, a company should pursue metrics that allow it to be compared with other companies – the equivalent, perhaps, of the detailed columns of the *Financial Times* or the *Wall Street Journal* for financial information. This is becoming more common in the environmental and eco-efficiency fields with the likes of the Storebrand-Scudder Environmental Value Fund. The social area is not well developed, but ethical-investment experts have selected firms that qualify on ethical screening criteria and looked at their stock market performance.

The Domini Social Index from Kinder, Lydenberg, Domini in the United States is an established example, and the Social Index recently introduced by NPI in the United Kingdom is to be followed by other indices from ethical investment researchers EIRIS. Such indices suggest that, as a whole, socially responsible companies tend to outperform the market – though there is obviously a lot of variation among firms. There is also evidence from US. research that companies that explicitly acknowledge ethical responsibility in their published reports outperform those that do not.

In short, current applications of admittedly crude metrics is suggesting that sustainable development pays: good business is good for business.

1 „The Usefulness of Standardized Environmental Data Evaluation for Benchmarking," a presentation by Dr. Markus Lehni of the WBCSD to the Third International Conference of the UNEP Insurance Initiative, Cologne, June 9, 1998.

[2] T. Gladwin, et. al., „Beyond Eco-Efficiency: Towards Socially Sustainable Business," Sustainable Development, 3, 1995", pp. 35-43.

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