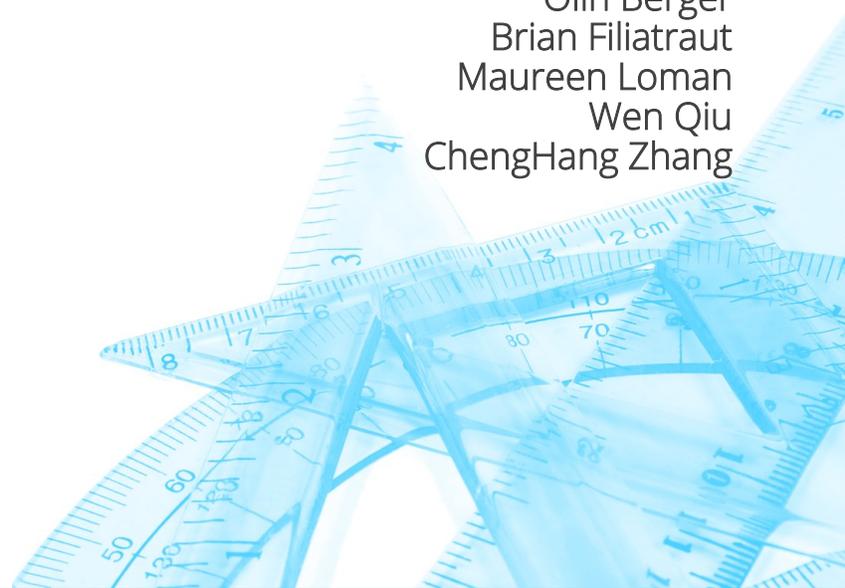


# The Growth of Sustainability Metrics

Sustainability Metrics White Paper Series: 1 of 3

May 2014

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RESEARCH PROGRAM ON

Sustainability Policy and Management

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The Earth Institute Research Program on Sustainability Policy and Management provides a rigorous analytic base to help inform sustainability decision-making. Our research addresses the fundamental issues facing professionals and policy makers implementing sustainability strategies. We seek to better understand the mechanisms behind sustainability management, in order to develop and promote more effective public policies and organizational practices. We analyze sustainability strategies and initiatives, examine methods of valuing sustainability practices, and study the impact of policies that stimulate sustainability innovations and trends. The goal of the program is to develop models to overcome barriers to institutionalizing sustainability in organizational operations. We aim to hasten the integration of sustainability principles in the management of organizations by providing the data necessary for decision-making.

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# The Growth of Sustainability Metrics

## Executive Summary

Over the past several years, many organizations have recognized the importance of sustainability and have developed their own sets of metrics, scorecards, ratings, and tools for measuring and tracking it. However, the term “sustainability” means different things depending on who you ask and what you want, and they all seem to have their own set of organization-specific indicators that vary widely in scope and scale. This lack of consistency leaves decision makers, as well as investors, consumers and the public, at a disadvantage.

Despite the lack of consensus over the term, the idea of sustainability has evolved from a vague concept to a set of precise definitions that attempt to present sustainability in quantitative terms and indicators. Among the broadest definitions, sustainability indicators measure things like water and materials use, waste diversion, and energy efficiency, but also include non-environmental issues like labor practices and corruption. While some people interpret sustainability as environmental inputs and impacts, sustainability as a holistic concept has moved beyond simply an environmental dimension to include various social, governance, and economic factors as well. As one might expect, with multitudes of sustainability definitions comes sustainability indicators that are equally varied and expansive.

The Earth Institute Research Program on Sustainability Policy and Management set out to landscape this field of metrics, conducting a thorough investigation of “environmental, social and governance” (ESG) metrics, and

found 557 distinct sustainability indicators. Some of these metrics are quantitative and easily measured, while others are difficult to conceptualize or are merely statements of policy. While the development of these indicators is critical and must be continued, it is time to begin the process of settling on organizational sustainability indicators that everyone can use and understand. We need standard indicators that are comparable, reliable and rigorous. We need a generally accepted set of definitions and indicators for measuring sustainability.

A common set of sustainability metrics will better enable organizations to utilize an understanding of sustainability to drive performance and competitiveness, rather than reacting to material environmental risks, stakeholder requests, or regulatory requirements. Deciding what indicators to track and to report is a critical step in engaging organizations, particularly in the private sector, in transitioning to a sustainable economy. Just as we have generally accepted accounting practices and clear definitions of financial indicators, we need to extend that process into physical measures of organizational performance: sustainability metrics. In the absence of a commonly accepted core group of metrics, it is difficult for policymakers to mandate disclosure of an open-ended range of indicators. While this need for universal indicators may be clear, the selection of specific indicators is not. This report represents the first stage in a long-term research project dedicated to developing that set of indicators.

## Introduction

What is sustainability? How do you measure it and how do you manage it? We define sustainability management as the economic production and consumption that minimizes environmental impact and maximizes resource conservation and reuse. Sustainability management is both a practical and long-term approach to organizational management. Concern about sustainability is an effort to correct modern management and move it away from the world of financial manipulation and back to the traditional and real world of physical resources and constraints. The principles of sustainability management are built on an understanding of our dependence on nature for human well-being, and that economic progress and development is built on a foundation of environmental sustainability. Through sustainability management, environmental protection and efficient use of resources is not a mere enhancement to a production process, but is *central* to that process. Sustainability leaders and managers must make efficient use of energy, water and other raw materials, and must pay attention to the content and full cost of the waste produced by their business processes.

We have made great advances in sustainability management. We now better understand the need to take the physical aspects of sustainability into account when making strategic choices and management decisions, when deciding where to invest time, money and people. However, in order to implement significant organizational change, decision makers at all levels need clear metrics that quantify and demonstrate the benefits of sustainable practices. In practice, both in the private sector and public sectors, the absence of generally accepted sustainability metrics creates significant challenges. Metrics or indicators are the variables that are used to describe characteristics or states of a given entity or system. We need metrics because you cannot manage something that you do not measure; you need to know if your actions are making something better or worse. Sustainability metrics quantify, measure, and benchmark environmental performance.



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In July 2013, the Earth Institute at Columbia University initiated the Research Program on Sustainability Policy and Management to provide an academic research base to the field of sustainability management. Tackling sustainability from an organizational perspective, we engage in research on the practical problems of sustainability management in the public and private sectors, with a focus on work that will inform how real organizations manage these issues. The Earth Institute Research Program on Sustainability Policy and Management gathers experts in policy and management to analyze sustainability strategies and initiatives, examining methods and value of sustainability practices, studying the impact of policies to stimulate sustainability innovation trends, and developing models to overcome barriers to institutionalizing sustainability in organizational operations. The scientific rigor and academic leadership for which the University and the Earth Institute is known are drawn upon to create an interdisciplinary community dedicated to cutting-edge research to help develop solutions to the challenges of sustainability. The interdisciplinary expertise generally required for constructing, measuring and tracking sustainability metrics has hindered the emergence of widely adopted frameworks and indices. This project brings together experts from a variety of disciplines, including management, economics, environmental policy, political science and public administration. It also draws upon the wealth of expertise from across the Earth Institute in the related disciplines of environmental sciences, health sciences, engineering, social sciences and law.

This study on sustainability metrics and reporting was motivated by exploratory conversations with over a dozen sustainability officers at major multinational corporations. A few key themes emerged from these conversations, but the most common, and the most critical, was the absence of universally accepted sustainability metrics and the challenges associated with this gap. Many organizations now recognize the salience of sustainability considerations to the success of core operations. However, to achieve consensus in order to implement significant organizational change, decision makers need clear metrics that quantify and demonstrate the benefits of sustainable practices. Currently, activities and reporting efforts in this field vary considerably by company, by industry, by sector, by location and over time. Sustainability reporting as a management tool is still a new field; and reliable, consistently applied metrics for sustainability have yet to emerge.

The lack of consistency implies that there exist several competing methods to measure even relatively simple concepts such as energy efficiency. Therefore, we found it was imperative to assess the landscape of sustainability metrics, to develop a thorough compilation of the diversity of metrics in use, and to formulate the questions that must be answered when working towards standardization and parsimony in this field. Specifically, we need a theoretically-grounded process to analyze and

ultimately select among the variety of environmental sustainability indicators tentatively proposed by governments, corporations and other organizations with the objective of arriving at a specific, valid, robust and parsimonious set of measures which eliminate redundancy and facilitate decision-making when the inevitable trade-offs across multiple objectives are encountered.

There are a variety of different methods for measuring sustainability and for reporting those efforts. Each company we interviewed had different measures to operationalize the broad concept of sustainability and employed divergent methods of computation, units of measurement and scaling that were not always comparable or consistent over time. We surveyed the landscape of sustainability metrics, frameworks and indices and compiled a database of 557 indicators, gleaned from reviewing sustainability reports issued by corporations, municipalities and non-profit organizations.

This white paper presents the growth of sustainability management, describes the current landscape of sustainability metrics, and introduces the challenges presented by the lack of standardization in sustainability measurement and reporting. We conclude by outlining the next stages of research, and how our work fits into the broader community of scholars working to advance towards a sustainable global economy.

## The Growth of Sustainability Management

After decades at the periphery of political and business agendas, sustainability and environmental protection have emerged at the center of our economic and political dialogue. As consumption and population rises, the planet's resources are showing signs of strain, and energy, water and waste management have become major cost items in the budgets of public and private organizations. Unlike environmentalists, sustainability managers do not care about preserving the environment because they love nature, but because it is essential for

continued value creation. Increasingly, an organization's ability to achieve sustainability is seen as an indicator of a well-run organization. A well-run organization will measure and report on natural as well as financial, manufactured, intellectual, human, and social capital.

Sustainability management is economic production and consumption that minimizes environmental impact and maximizes resource conservation and reuse. The depletion and degradation of our natural

resources has changed the cost structure of production in all organizations. Leaders and managers must now redouble efforts to make efficient use of energy, water and other raw materials, and must pay attention to the content and full cost of the waste produced by their business processes. Sustainability management requires that organizations learn how to think about the long-term instead of focusing on weekly, quarterly or daily reports. The issue of sustainability is no longer a luxury item or an add-on to those factors routinely addressed by management; it has moved to the apex of management concerns.

This new field of study combines organizational management with the field of environmental policy. In some respects, a concern about sustainability is an effort to correct modern management and move it away from theory back into the real world of physical resources and constraints. The principles of sustainability management are built on an understanding of our dependence on nature for human well-being. Nature is not protected for its own sake, but for ours. In sustainability management, environmental protection and efficient use of resources is not added to a production process but is central to that process. The best run organizations try to minimize their use of non-renewable resources and reduce their environmental foot-print. Companies like Walmart do not do this because they love nature, but because they see it as a way to make money. It becomes yet another cost advantage a company uses to beat the competition.

The economic theory of externalities predicts that private actors will generally ignore the external costs borne by the environment and that governments are the likely stewards of natural capital. However, the growth of mega-corporations implies that the largest global corporations are larger than most governments. For example, measuring companies by their total revenue and countries by GDP, Walmart with sales of \$476 billion is larger than Austria, Thailand and South Africa, which are the 27<sup>th</sup>, 28<sup>th</sup>, and 29<sup>th</sup> largest countries by GDP, according to the United Nations, respectively. The

same logic applies to cities and sub-national governments. California is the 8<sup>th</sup> largest economy in the world and Mexico City is the 16<sup>th</sup> largest (California Poised 2013, Florida 2011, Walmart 2014, Trivett 2011). The expanding scale of multinationals and sub-national governments have made them aware of the ecological limits upon which their operations depend.

We believe that sustainability is simply the latest step in the past century's evolution of the field of organizational management. The development of the modern field of management began in the early 20th century with the invention of the techniques of mass production and the assembly line -- followed by the start of modern human resource management. Later, we saw the development of Generally Accepted Accounting Practices (GAAP) and the evolution of the Chief Financial Officer. In the 1960's-1990's, computing and communications technology advances resulted in the growth of non-financial performance indicators. Well-run organizations established Chief Information Officers to manage the exponential increase in information pouring in and out of the organization. By the end of the 20th century the growth of the global economy required that many organizations develop more capacity to operate internationally. The modern CEO must now understand all of it: production, finance and financial management, human resource management, information management, and international trade and commerce.

A decade into the 21st century, organizational management needs another dimension: **a physical one**. Traditionally, water, energy and waste were minor factors in an organization's cost equation. Those days are gone. On an increasingly crowded planet, the scale of production of everything has grown and with it we see an increased draw on the earth's finite resources. The costs of water, raw materials and energy are an increasingly important part of the cost calculus for the modern organization. Waste disposal is no longer cheap or free and the organization that figures out a way to reduce and re-use waste has a significant cost advantage over organizations that do not.

## ...the definition of effective management will include sustainability management.

Our view is that within a decade the definition of effective management will include sustainability management. The field of sustainability management can help us manage our global economy, ensure long-term growth, and secure a sustainable material future, but we need public policies and private management innovation to

accelerate the transition to such a sustainable economy. Following the lead of both private sector corporations and public sector policymakers, the field of sustainability management is focused on analysis of strategies and implementation of the most effective technologies and policies.

### The Sustainability Perspective

The term “sustainability” has numerous definitions. Consensus on the interpretation of sustainability remains elusive, despite decades of scholarly work on the topics (Bithas and Christofakis 2006; Fischer et al. 2007; Tanguay et al. 2010). In fact, while many point out that the vague and varied definitions of the term sustainability and sustainable development have made advances in the field somewhat difficult, Dietz and Neumayer (2007) claim that the concept has in fact won such widespread appeal because it resists a single interpretation.

Despite the challenges to define sustainability, there are a number of core features that most interpretations incorporate. “Firstly, the idea of sustainable development is a pragmatic and anthropocentric one. It primarily focuses on people and their wellbeing. At the base of sustainability are our needs... Secondly, human life should be ‘healthy, productive and in harmony with nature.’ This principle implies a quest for balance among the three sustainable development pillars... Thirdly, another essential feature of sustainability is [its] dynamic and long-term nature” (Moldan et. al 2012). Sustainability is an effort to sustain production today without impairing our ability to produce in the future. Our goal is not conservation of resources, but the continued productive use of them. We do not conserve resources for posterity, but we manage

resources for their continued use. If a resource can only be used once, we try to learn how to re-use it, or we try to avoid using it. Our goal is to base our consumption on resources that can be grown or renewed. The most effective managers will adhere to sustainability principles because they lead to long-term profitability. A sustainability perspective would lead a CEO to question an entire production process and to see if there was some way to manufacture the same good or service without generating pollution and waste in the first place.

The sustainability perspective is an effort to use design, engineering and public policy to make economic production and consumption efficient and effective. Pollution and poisoning people or the planet may provide some short-term benefits, but our experience with environmental remediation and restoration tells us that these short-term benefits are consumed quite rapidly, and are soon replaced by longer-term costs. Clean-up costs may seem optional, but if the alternative is to allow a key resource to be destroyed, the cost must be paid. Since 1980 and for the foreseeable future, America's military, industries and citizens will be paying hundreds of billions of dollars to clean up the toxic wastes dumped throughout the 20th century. Developing countries will soon be facing similar clean-up bills.

# Sustainability Metrics and Indicators

Despite the lack of consensus over the term, over the course of the last few decades, the idea of sustainability evolved from a vague concept to precise definitions that attempt to present sustainability in quantitative terms and indicators (Moldan et. al 2012). However, broad definitions of sustainability lead to sustainability indicators that are equally varied and expansive. Indicators are the variables that are used to describe characteristics or states of a given entity or system.

While some interpret sustainability to mean environmental inputs and impacts, sustainability as a concept has moved beyond the environmental dimension and come to include various social, governance, and economic factors as well. This expansion of the definition is demonstrated by the common phrase “environmental, social, and

governance” (ESG) metrics, a term often used synonymously with “sustainability indicators,” most typically on the corporate side. The term can also be used to describe the “triple bottom line” or sustainability in environmental, social, and economic factors, most typically used to describe governmental sustainability or sustainable development (at the national or city level). Within the broadest definitions of sustainability they include measures of water and energy efficiency but also issues like labor practices and corruption.

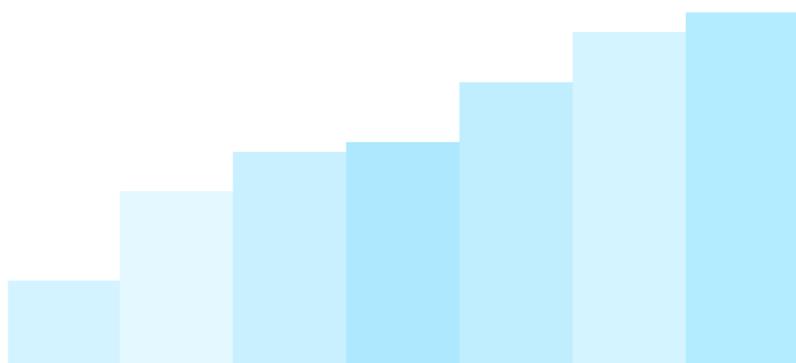
Our review of sustainability metrics uncovered close to 200 distinct indicators in each of three categories—environmental, social, and governance—resulting in 557 total indicators. The following represents key observations and findings during this collection process.

## Environmental Metrics

Environmental indicators are what we call the physical dimensions of sustainability—the traditional environmental sustainability metrics—including those such as greenhouse gas emissions per dollar of revenue or per product produced, amount of wastewater produced, amount of freshwater utilized, percent of materials recycled, etc. After exhausting our preliminary data sources, we categorized the environmental indicators by type, as follows (with number of metrics in parentheses):

- Energy (37)
- Emissions (35)
- Disclosure (30)
- Water (24)
- Materials (23)
- Effluents and Waste (19)
- Biodiversity (10)

From this categorization process, we observed that “Energy” was the clear leader in sheer number of metrics. This category generates considerable attention from reporting organizations. It is widely considered one of the primary measurements for organizations engaging in efforts of environmental responsibility. However, there is still considerable variation in the specific indicators utilized to measure energy use. For example, units of measurement included joules, kilowatt hours, air separation units, gigawatt hours, and tons of oil equivalent. Indicators in this category also measured indicators like energy efficiency or renewable energy initiatives and energy mix.



The category with the second largest number of metrics was “Emissions.” This is partially due to the fact that there were a variety of different indicators to measure carbon dioxide emissions, but utilized different metrics to do so. Carbon dioxide emissions are arguably the most well understood metrics from the vantage point of the general public, as terms like “carbon footprint” have become part of everyday language. But within this category, we found different indicators measuring emissions of each of the main greenhouse gases, aggregate greenhouse gas emissions, carbon emissions by use (facilities, travel, etc.) and a variety of carbon intensity

measures. This variety in simply one sub-category of environmental impact (greenhouse gas emissions) reflects the sheer range of these indicators. Can these be reduced to optimize collection and reporting?

The third largest group of metrics was “Water,” which, like “Energy,” generates considerable attention from reporting organizations. Water is a visible environmental resource that we all use every day. Metrics in this category included overall water use as well as sources of water such as amount of ground water, surface water, and municipal water.

## Social Metrics

Our collection of social metrics resulted in roughly the same number of total indicators as we collected for environmental criteria. Even though there are nearly 200 social metrics available, in practice less than 20 are usually used in a single report. The total number of social metrics we found was 183, of which 60 are used by private sector, and 123 by government. Again, we categorized the metrics by similar characteristics (with number of metrics in parentheses):

### Private Sector

- Human Rights & Resources (40)
- Performance in Products, Production & Supply Chain (20)

### Public Sector

- Safety & Health (84)
- Population (12)
- Infrastructure (11)
- Budget & Expenditure (9)
- Education (7)



*Definitions of the social dimension of sustainability are less clear-cut than the environmental dimensions.*

Social metrics track organizations’ performance on equality, justice and other social impacts, but the metric and category boundaries are vague compared to environmental metrics. Definitions of the social dimension of sustainability are less clear-cut than the environmental dimensions (Martin 2001). “Understandably, the diversity of economic, social and cultural conditions in individual countries makes development of a uniform definition of social sustainability very difficult” (Moldan et. al 2012). The lack of precise categorization is one of the difficulties in analyzing social metrics. Some non-financial metrics that are not clearly categorized are also viewed as social metrics, which contribute to the large inventory of these types of indicators. Not only can these metrics be ambiguous, the definitions of social sustainability are often simply statements of the general social policy goals rather than serious attempts to define the social dimension of sustainability (Colantonio 2007; Moldan et. al 2012).

Some social metrics do offer quantitative measurement. For example, while measuring impacts on human rights, measurement may include counts of activities and spending per unit of revenue. However, most of these types of indicators are reported using simple “Yes or No” responses (i.e. whether a company has a human rights policy.) In practice, social impacts are more difficult to observe and quantify than environmental impacts. Environmental performance involves more material impact in both input and output, and thus can be measured more accurately by both input and output. For measures of social performance, quantitative methods more often are applied to measuring input, i.e. input in employee trainings, number of activities involving community etc.

## Governance Metrics

Our research uncovered a total of 196 governance metrics. Governance indicators track how responsive a company is to its investors, the structure and function of the company's board, the rights of shareholders, the disparity between CEOs' salary and the average employee's salary, the transparency and organizational structure of a company, and prevalence of corruption. Our review of governance metrics found that many descriptions of governance indicators were either very limited or nonexistent, and even those with descriptions did not provide enough information to determine the type and quality of measurement. Some are just yes or no questions, seeking whether a company has a policy or not. Many governance indicators are simply a part of the company's mission statement or company profile. Except in the case of a handful of quantitative indicators, neither the database provider nor the computing entity has an effective method of measuring transparency and organizational structure.

Social benefits are also usually value-laden, as well as place- and time-dependent (Eccles, Serafeim, Krzus 2011). “The environmental dimension of sustainability can be based on objective scientific evidence. However the economic and social dimensions relate to human society and cannot be divorced from some reference to its ultimate purpose.... these terms may be defined in particular cultures, societies or spiritual traditions.... Since values are difficult to define and measure, with few widely accepted or standardized methodologies (Hitlin and Piliavin 2004), they have often remained beyond the realm of scientific enquiry and indicator development” (Dahl 2012).

Based on the governance indicators that we found, we were created four categories based on similarities the indicator's description (with number of metrics in parentheses):

Transparency (121)

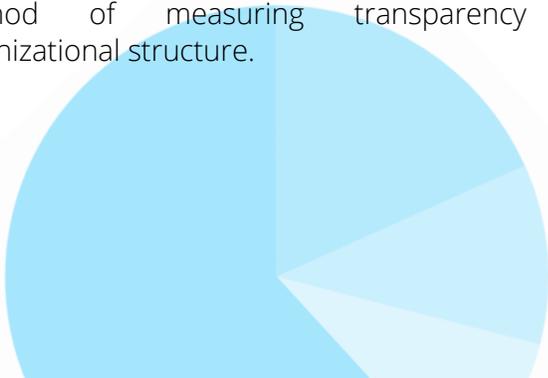
Equality & Fairness (36)

Efficiency (21)

Corruption (18)

Transparency was the largest category, consisting of 121 indicators. Many of the common indicators center on board metrics, e.g. meeting attendance, composition of board, independence among members, and compensation of members. They also focus on the executive power of the board, i.e. the number of CEOs, executive-level positions, non-executive members. These indicators are the most quantitative among the governance indicators.

We found a total of 18 corruption-oriented indicators, and of those, roughly half are quantitative providing information that is easier to compare among companies and governmental entities. Other governance indicators provide a small inside-look



into the diversity and equality found with private firms. Some of these metrics indicate whether or not a company has a given policy or is a part of compact or coalition. They are fairly nondescript and do not provide much insight into how a private company operates or incorporates ESG into its business practices.

Ultimately, the manner in which a corporation operates speaks to the nation-state within which it resides. Therefore, the governance metrics that are collected and reported vary considerably across

countries. Governance is a critical aspect to any business or government. It illustrates the level of transparency and connectivity that it has with its shareholders, citizens, or other stakeholders. Yet, the metrics that we uncovered do not, after initial analysis, seem to be “key” indicators, but rather a box to check off to generate the impression that a business is institutionally “sustainable.” There are some metrics in this category that are useful in determining elements of a company’s or a government’s level of sustainability, but for the most part, they seem like an afterthought.

## Sustainability Metrics Frameworks & Composite Indices

The ability to accurately measure sustainability is crucial to achieving sustainable development goals at every level, and the need to quantify concepts of sustainability into metrics or indicators has been well documented in the academic literature. (See Tanzil and Beloff 2006; Szekely and Knirsch 2005; and Azapagic and Perdan 2000 as examples.) Sustainability indicators are able to summarize a vast amount of information about our complex and complicated environment into concise, policy-applicable and manageable information (Godfrey and Todd 2001; Warhurst 2002; Singh et. al 2012).

Sustainability indicators are either presented in a structured framework that can be used to isolate and report on relevant indicators (Lundin and Morrison 2002), or aggregated towards a composite index or score/rating. Not surprisingly, the criteria for these types of indices are as diverse as the

concept of sustainability itself (Mayer 2008). In general, sustainability frameworks provide qualitative presentation and grouping of large number of indicators and can be more revealing and accurate than aggregated indices, while indices tend to be easy to use and more easily understood by the general public. Frameworks, in contrast to indices, do not involve quantitative aggregation of data. They provide qualitative ways of presenting large numbers of indicators (Olalla-Tárraga, 2006). According to Anand and Sen (1994), frameworks may be preferable to indices because all the information is presented, and not hidden behind aggregated data.

Analysis of this large universe of frameworks and indices will be covered in a white paper to be published in summer 2014.

The ability to accurately measure sustainability is crucial to achieving sustainable development goals at every level.

## Implementation of Sustainability Indicators

A variety of organizations (private corporations, government agencies, consulting firms, non-profits, etc.) have developed scorecards, indices, ratings, tools, and programs to help organizations measure, track and report sustainability. In addition, significant work has been done to measure and track progress on sustainable development at the national level, with a wide variety of indices that rank and score countries' performance. Based on various frameworks and aggregation methodologies outlined in the academic literature, a number of organizations have attempted to select relevant indicators and develop all-encompassing indices or frameworks to measure sustainability. Just a few of those are discussed here:

Since 1999, the Global Reporting Initiative (GRI) has been working towards establishing a credible set of sustainability indicators using four key areas of performance and impact: economic, environmental, social and governance. GRI's sustainability guidelines have become among the most commonly used for sustainability reporting, and it aims to become the universal standard – regardless of an organization's size, sector or location. GRI provides general indicator guidelines as well as sector-specific guidance, both of which are refined and updated over time.

The Sustainability Accounting Standards Board (SASB) is a non-profit engaged in the creation and dissemination of sustainability accounting standards for use by publicly-listed corporations in disclosing material sustainability issues for the benefit of investors and the public. SASB is developing sector-specific standards that it hopes will allow all stakeholders to understand ESG metrics and ensure reliable comparison. By focusing on industry-specific standards, they expect to be able to compare "apples to apples." In 2010, Harvard University's David Wood, with Steve Lydenberg of Domini Social Investments and Jean Rogers of Arup, developed a methodology for determining industry-specific

material issues and their associated, industry-tailored performance indicators. They applied their methodology to six industries, using indicators already in use, to describe those particular issues. The team focused on developing a process for determining key performance indicators, but stopped short of defining those specific metrics. They argue that materiality of these indicators varies by industry and ought to be accounted for in any type of mandatory sustainability reporting (Lydenberg, Rogers, Wood, 2010). This methodology became the basis for SASB, which is currently developing standards in ten sectors.

The Sustainability Consortium, led by the University of Arkansas and Arizona State University, is an organization working to build a scientific foundation to drive innovation to improve consumer product sustainability. It develops transparent methodologies, tools, and strategies to drive a new generation of products and supply chains that address environmental, social, and economic issues.

Dow Jones, MSCI and FTSE, among other stock exchanges and financial firms, have developed methodologies to track and score sustainability indicators for their own sustainability indices. A variety of sustainability consulting firms have also developed tools for clients to assess the environmental data that is most material to their firm and industry.

The list could continue indefinitely. However, while some of these platforms are rigorous and seek to provide comprehensive information about sustainability and ESG issues, ultimately, they lack universal comparability, assurance of reliability and rigor, and materiality. Indeed, many of these efforts were not intended to achieve consistency, or to facilitate intra- or inter-industry comparability. Some groups, like GRI and SASB, are synergizing efforts, but there is still a long way to go before a universally accepted standard exists that replicates the

applicability and universality of traditional financial indicators and generally accepted accounting principles.

While the decentralized approach to the development of sustainability indicators has led to a multiplicity of actors and a robust process of debate,

the lack of regulatory action has stymied efforts at consensus. At the same time, the lack of consensus among the multiple constituencies in this field ensures that regulatory action is not imminent. It is this vicious circle of inaction that we hope to short-circuit by catalyzing the development of a parsimonious set of metrics.

## Future Stages of Research

In our next stages of research, we will attempt to identify a core group of metrics that have the potential to become generally accepted sustainability indicators with the universal legitimacy of generally accepted accounting standards. We plan to analyze whether social and governance indicators are inherently culturally, politically, and geographically relative. If so, only the physical dimensions of environmental sustainability are likely to emerge as core sustainability indicators. In work towards universal metrics, we will explore how managers, policymakers, investors, and other stakeholders utilize sustainability information in decision-making.

This project is among the foundational steps in the path towards that long-term goal. We aim to: 1) generate new data on the current landscape of sustainability metrics, including information revealing the most common among these measures, and new data on the aggregation and weighting of

these indicators; and 2) provide new understanding of the role of sustainability in management decision-making by improving our knowledge of the methods and measures of sustainability initiatives and issues. This work can advance the decision-making tools and models available to a variety of stakeholders who are eager to incorporate the physical dimensions of sustainability into their management practices.

Like the decades-long process that resulted in generally accepted accounting principles (GAAP), we believe the process to settle on a set of **mandated** generally accepted sustainability metrics, including standard methods of collection, reporting, and verification, will take years, if not decades. This white paper represents the very early work in the first stage of what we believe is a three-stage process towards developing generally accepted sustainability metrics.

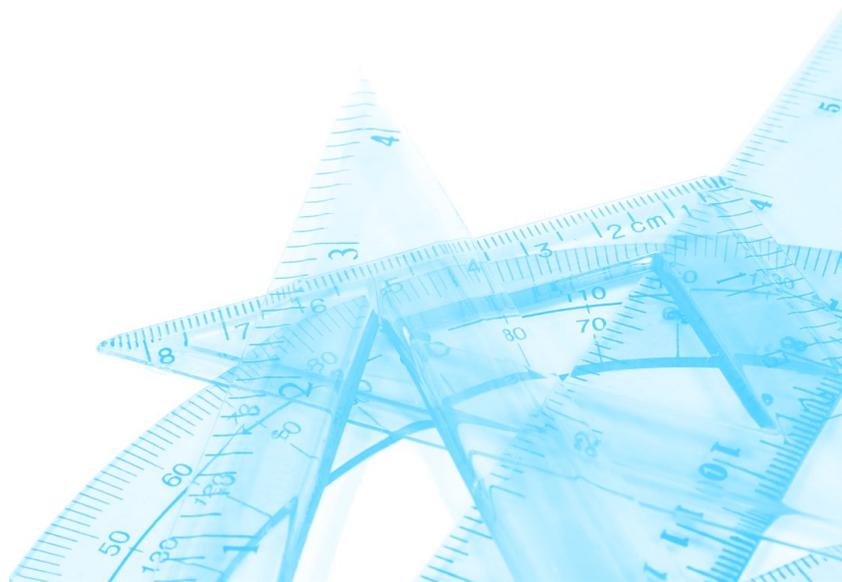
- 1** Research to develop a recommended set of core sustainability metrics
- 2** Consensus building toward agreed-to metrics (via a *Sustainability Metrics Consortium* or similar body)
- 3** Federal action to develop policy tools and regulations needed for compliance, monitoring, and enforcement of mandatory sustainability reporting (via a *National Commission on Sustainability Metrics* or similar body)

## Conclusions

We've seen that there is a very large universe of indicators to measure the sustainability performance of an entity, but critical questions of which and how many indicators remain. While the development of these indicators is critical and must be continued, it is time to begin the process of settling on organizational sustainability indicators that everyone can use and understand. We need a generally accepted set of definitions and indicators for measuring sustainability.

The loose boundaries of the definition of sustainability leave decision makers at a disadvantage as they try to understand how and what to manage to improve their sustainability performance. To facilitate the shift towards a more sustainable economy, an improved system of measurement and management tools are needed. The long-term goal of our work is to develop, for the physical dimensions of environmental sustainability, a set of generally accepted metrics that replicates the applicability and universality of generally accepted accounting principles (GAAP).

Convergence on a set of generally accepted sustainability metrics will drive momentum toward a pivot in organizational focus from reporting, disclosure and transparency towards uncovering real opportunity, competitive advantage and financial and non-financial benefits of sustainability. As sustainability becomes clearer and more accessible to a greater number of users, its uptake will expand. It will better enable organizations to utilize sustainability to drive performance and competitiveness, rather than reacting to material environmental risks, stakeholder requests, or regulatory requirements. Deciding what indicators to track and to report is a critical step in engaging organizations, particularly in the private sector, in transitioning to a sustainable economy. A focus on core, critical and material sustainability metrics, measured by performance rather than disclosure, can drive the transition to adopting concepts of sustainability into traditional organizational management structures and processes.



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