

Building Sustainability in Hard Times

Integrated EHS Platforms Support Cost Savings

The triple bottom line concept for sustainability, addressing economic, environmental, and social business effects, is becoming well established in corporate boardrooms. This is particularly the case for companies with sensitive environmental, safety, and social footprints, where related operating costs are substantial, and failure to perform can impede an otherwise expanding license to operate.

IT-based solutions play a major role in driving triple bottom line performance, and streamlining daily operations to keep a company's sustainability house in order. There is an inextricable link between driving actual sustainability, and having the data management systems in-place to measure and coordinate daily performance. A combination of corporate culture, technology, and management systems enable the right processes to occur. Yet in today's challenging economy, investments in the environmental, safety, and social domain are being carefully scrutinized, including those that are IT related.

The good news is that Sustainability IT projects have strong business cases, and that these can even be more compelling in a tough economy. This paper focuses on the IT systems supporting sustainability performance, addressing:

- How Corporate Responsibility Supports Business Objectives. Solid business reasons that Corporate Responsibility matters in today's economy, including real-life examples.
- Building Your Sustainability Systems. How to establish an enterprise foundation for triple bottom-line data, and build the house of sustainability one system at a time.
- Executing the Project. Keys to keeping risk low during system implementation.
- Creating the Business Case. Providing a practical, hands-on approach for justifying a sustainability IT investment.

An IHS White Paper by
David Cox, PE and
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"Clearly, companies must manage their EHS portfolios and EHS data carefully to avoid putting themselves at risk."

Dan Miklovic
"Turning EHS Challenges into Benefits"



How Corporate Responsibility Supports Business Objectives

As put forth by the Brundtland Commission convened by the United Nations, sustainability is comprised of the triple bottom-line of economic growth, environmental stewardship, and social progress. These interrelated components are shown in Figure 1 below.

In a tough economic environment, companies do not make investment decisions lightly, including those related to sustainability. Fortunately, as discussed in this section, there is a strong alignment between overall business objectives and a focus on the triple bottom line. Anecdotally, more than 78% of attendees surveyed at the 2008 Business for Social Responsibility (BSR) conference were optimistic that corporate responsibility would be embraced as part of core operations in the next five years, although 31% expected CR budgets to decrease, emphasizing the theme of doing more with less.ⁱ

As stated by Gartner, “Clearly, companies must manage their EHS portfolios and EHS data carefully to avoid putting themselves at risk.”ⁱⁱ Smart companies leverage their sustainability-related investments in environmental, health

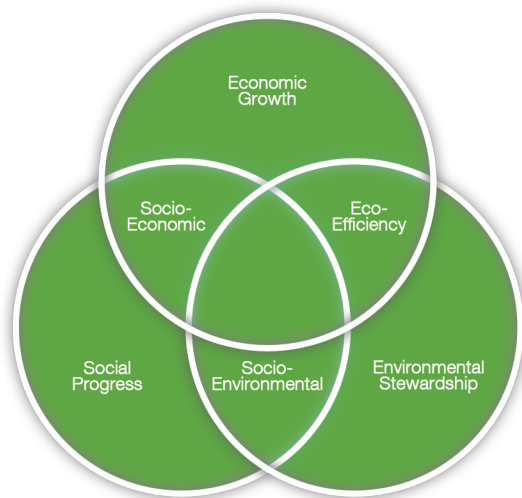


Figure 1: Brundtland Commission Paradigm for Sustainability

and safety compliance, as well as in community outreach, to meet multiple business objectives. This section reviews how sustainability objectives are closely tied to overall business goals, providing real-world examples with a focus on process-intensive industries.

That’s why a growing number of organizations are adopting new, holistic Environmental, Health, and Safety (EH&S) software platforms. These enterprise platforms enable executives and managers to effectively assess current conditions and develop forward looking business strategies that transform these business challenges into opportunities for a competitive advantage. In order to compete and prosper in this new business environment, organizations need to adopt a comprehensive GHG management strategy that enables efficient emissions monitoring and management. An integrated EH&S software platform is an essential component of that strategy.

A. Cost-Effective Daily Compliance

Responsible companies maintain daily environmental, health, and safety compliance in an efficient, routine manner. This proactive approach, often assisted by IT solutions, is far more cost-effective than allowing many non-compliance problems to occur and necessitate corrective actions. There are many examples of cost savings tied to a systematic sustainability governance approach.

- Alcoa operations at a Tennessee facility report facility-level savings of more than \$160,000 per year as a result of reducing third-party inspections and faster discovery of equipment reliability issues.ⁱⁱⁱ
- Campbell Soup at the Napoleon, Ohio facility reports having shortened EPA inspection times from days to less than one hour at the 65-acre food manufacturing site.^{iv}
- Volvo reduced water usage by 10 million gallons a year, along with air emissions and the associated costs.^v

- DAK Americas transformed their leak detection and repair (LDAR) program from a compliance cost center into a new profit center.^{vi}
- Cardinal Glass and Hunter Douglass each cut worker's compensation costs by over 50% with support from automated data management solutions.^{vii viii}

In these cases and others, IT solutions play an important role in weaving compliance into daily operations, helping to achieve cost savings as compared to manual or ad-hoc approaches.

B. Maintaining a License to Operate

From local communities to national governments, the jobs, tax revenue and innovation stemming from business activity is very desirable. For example, a 2004-2005 joint Oxfam and Unilever study in Indonesia found that new business activity resulted in 300,000 additional jobs created and \$130 million in additional taxes to the government.^{ix}

As business expands, so does government revenue, so maintaining the license to operate should be in everyone's interest. A record of strong and effective sustainability performance can earn flexibility with government regulators, which can make expanding or establishing new operations much faster and easier. On the other hand, poor corporate responsibility can cause a company to lose its license to operate, either in the immediate community near a large industrial facility, or in an entire country or region.

This is a major consideration for extractive industries such as mining, where companies rely on government mineral concessions over a long time frame. This industry has taken an aggressive positive direction in corporate responsibility through the CEO-led International Council on Mining and Metals (ICMM), establishing The Sustainable Development Framework (ICMM

Framework)^x. The ICMM Framework consists of 10 Principles, public reporting, and independent assurance. Rather than adopting a whole new reporting guideline, the ICMM smartly leverages the Global Reporting Initiative (GRI) guidelines plus an additional mining sector supplement.

Transparent, accurate reporting is an important part of maintaining the trust needed for the social license to operate. Sustainability IT solutions reduce the manual effort required for reporting, provide an audit trail to streamline verification, and centralize the storage and management of sustainability data, making the performance of third-party verification far easier and much less expensive than manual approaches, like the use of hundreds of insecure spreadsheets.

C. Executing a Climate Change Strategy

Regulatory programs governing greenhouse gas (GHG) and energy data will impact your bottom line. As summarized in an influential Harvard Business Review article, "Companies that persist in treating climate change solely as a corporate social responsibility (CSR) issue, rather than a business problem, will risk the greatest consequences."^{xi}

The first step in an organization's climate change positioning is to assess its emissions profile.^{xii} This step alone is a challenge for energy-intensive, multi-site businesses.

Following the assessment, additional business impacts need to be considered, like capital projects and M&A activities, as well as the management of emission allowance portfolios. For example, a recent McKinsey study finds that regional differences in power pricing can have a substantial impact on the EBITDA of primary aluminum companies.^{xiii} Climate change strategy directly influences earnings and operational flexibility.

A comprehensive software platform is essential for collecting, analyzing and reporting data, for managing compliance, and for assessing outcomes based on established benchmarks across the organization.^{xiv}

D. Strategic Decisions and a Competitive Advantage

Strategic decision-making requires data. Sustainability related information is an increasing component of such decisions whether it is in the context of climate change, fresh water availability for products and operations, or the market for new products and services.

For example, over two-thirds (68 percent) of the business leaders surveyed by IBM are focusing on CSR activities to create new revenue streams.^{xv} Companies are seeking ways to capitalize on global sustainability drivers, ranging from climate change to fresh water, to make more money while creating a positive corporate responsibility profile. For example, the GE ecomagination business generated approximately \$17 billion in 2007 revenues.^{xvi}

Sustainability IT systems can provide the baseline data against which improvement is measured and the information needed to assist with “what if” scenarios. Without a robust set of baseline data, and the IT solutions to manage, process and analyze this information, the enterprise can only make guesses about the impact of different sustainability issues on revenues.

E. Uncover and Manage Operational Risks

Active risk management helps uncover risks while they can still be proactively addressed. This contrasts with a purely reactive approach focused on fixing problems after the fact.

A disastrous example is the 2005 BP Texas City Refinery explosion that resulted in a substantial loss of life and revenue for the company.^{xvii} BP cites a combination of root causes, with company cultural issues being a primary contributor to the incident. In addition to the staggering loss of life, with 15 people killed and over 170 injured, the financial losses were tremendous. As a result of infrastructure downtime and repairs following the explosion, BP was fined more than \$21 million by OSHA and lost an opportunity to invest approximately \$1 billion of business capital into new programs and budget items.^{xviii}

Supply chain operational risks are another example where costs can be very high, and the options for reacting well to them are quite limited. For example, in a recent case a Western Australia gas plant explosion interrupted the sole natural gas energy supply to certain Alcoa and Oxiana Ltd mining locations, causing estimated losses of \$10 million US per week.^{xix} There are many other well-known examples involving the supply chain for toy companies, consumer product retailers, and grocers where lack of controls put business finances and reputation at risk.

The management systems and supporting Sustainability IT system addressing these risks are far less expensive than dealing with sudden and substantial negative impacts from risks that are unknown and unmanaged.

F. Responding to Shareholder Inquiries, Creating Stock Demand

Shareholders are increasingly concerned about sustainability issues, both in the form of resolutions and data queries. Increasing requirements from shareholders make it clear that sustainability performance can make a difference in stock selection.

The Securities and Exchange Commission is helping investors to make educated decisions by requiring all public companies to warn investors of any serious risks that global warming might pose to their businesses.

Other influential groups such as the Carbon Disclosure Project (CDP), an independent not-for-profit organization, which queries the world's largest corporations each year with an increasingly detailed annual survey.^{xx} Institutional investors use the CDP, representing many trillions of dollars of potential demand for stock, to help evaluate company climate change policy, strategy, and performance.

Another influential group is the Global Reporting Initiative (GRI), an organization which negotiates global sustainability reporting standards with input from businesses, civil society groups, and governmental organizations.^{xxi} Institutional investors are looking to the GRI G3 reporting framework and industry supplements to foster more of an “apples-to-apples” reporting approach for sustainability reporting.

A mature Sustainability IT system makes it possible to respond in a timely, auditable manner. IT systems allow 3rd-party verification of reported information, in accordance with standards such as the AA1000 Assurance Standard^{xxii} emphasizing Materiality, Completeness and Responsiveness.

- **Materiality.** Data management systems reduce the burden of pulling together the vast quantity of information involved in sustainability reporting. Without an automated system, assembling hundreds of thousands of data points per year covering dozens of indicators is a tremendous burden.
- **Completeness.** Robust information management helps ensure Completeness. For example,

consider a company where GHG emissions are Material. The GHG indicator that is ultimately reported is often the result of hundreds or thousands of sub-calculations, combining data from facility-level operational databases, published emission factors and analytical results. The accuracy of these individual parameters varies, impacting the accuracy of the final calculated result. Managing all of this information is nearly impossible without a good data management system.

- **Responsiveness.** With a robust Sustainability IT solution, stakeholder inquiries can be answered without having to launch a new internal inquiry. For example, if one stakeholder wants information summarized by product line and another by facility geography, who can actually get their answer? Flexible reporting from the information management system can provide all such answers without burdening corporate resources.

Building Your Sustainability Systems

As succinctly stated by Forrester Research, to be effective, green business must build on a strong governance (GRC) foundation: “Companies adopting green business policies will find it difficult to achieve success without centralized controls and measurement. Security and risk professionals have learned this lesson already; responding to new legislation, breaches, or perceived threats creates cumbersome silos of management. Likewise, successfully implementing green business strategies is best achieved through a centralized GRC structure.”^{xxiii}

Using the metaphor of building a house, this section discusses the elements of a well-constructed sustainability system.

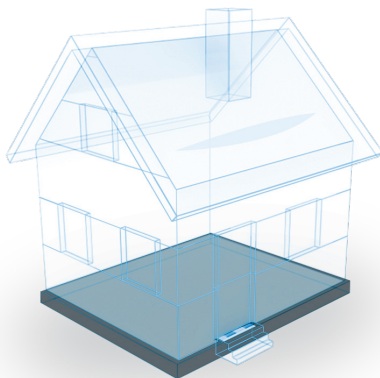
Laying the Foundation

What makes sustainability so complicated from a planning and operational level is that information management needs change as issues impacting business change. The really vexing part is that environmental compliance and social issues change

as quickly as the next regulation, scientific paper, global catastrophe or social issue reported on CNN. This means that the first critical step in your long term plan for sustainability is building on a foundation that is flexible to change with issues, business strategies, and your organization.

To ensure your ability to invest in sustainability you must document both direct cost savings along with indirect business benefits. The best way to detail these benefits is to be certain the sustainability foundation you invest in meets both short term tactical needs and long term strategic needs. To do this, your information foundation needs to support storing data for sustainability metrics management and, over the longer term, allow you to work back into the facility based processes. If managed correctly, these will enable you to drive improvements into operations.

Corporate roll up metrics are a useful first step to meeting corporate sustainability reporting objectives. However, without the ability to adjust what you are collecting to manage the processes that create the metrics, you may be stuck with an insufficient system that can measure results but not help find the cost reductions that are always found where the rubber meets the road in operations. So as you consider how to build your information foundation for sustainability the structural foundation or database architecture is critical to the long term delivery of business value. This database architecture



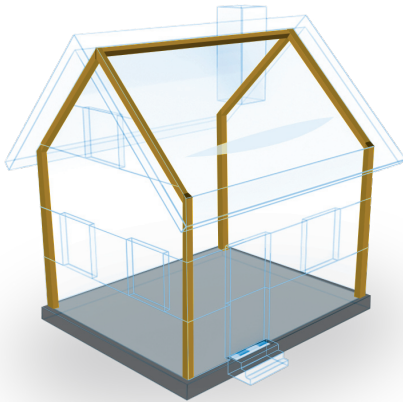
includes transactional data that is aggregated and transformed to meet both reporting and business intelligence needs. The following are characteristics of a solid, expandable foundation:

- Data Entry – Data entry in the Sustainability system must be fast. It is much easier to get employees to adopt and consistently use a system that works quickly.
- Transaction Transformation and Aggregation - Data aggregation is needed on transactional data that is going to be expressed in a summary form for purposes such as metrics reporting or analysis. The ability of your platform to transform transactional data into performance metrics is another important attribute to consider. As the frequency of data increases for more metrics and more facilities, transformation and aggregation flexibility becomes important. This ensures that you can report on equipment, facility, business unit, enterprise, geographic and governmental boundaries. Additionally, you can readily address new stakeholder queries.
- Performance and Scalability – The standard for performance data used to be as low as one value per facility per year. For example, total annual CO2 emissions. The frequency of data collection and the number of sustainability indicators reported are both rapidly increasing. Your system must be prepared to manage and display data across a global enterprise, and this requires performance and scalability to handle up to hundreds of facilities, tens of thousands of data points and millions of records.
- Reporting – Running existing reports and creating ad hoc reports must be simple and easy. Users must be given very straightforward methods for generating the results they need. To this end, the system should include a database configuration that is optimized for easy reporting. This means that the reporting database needs to be completely de-normalized, just the opposite of what is needed for high-speed transactions as mentioned above. Data entry and processing transactions should be accomplished in other parts of the system separate from the reporting area so that user traffic for reporting is not slowed down by transactional traffic.

- Business Intelligence – Efficient viewing and analyzing of KPI (Key Performance Indicator) results is also a must for the Sustainability IT system. The latest KPI information should be “teed up” for upper managers and corporate-level users to look at whenever needed. So, the system should include a configuration that provides KPI visualization and “drilldown” capabilities. To the IT person, this means that the system needs to have a data mart with KPI analysis cubes that can be displayed and analyzed using the organization’s standard business Intelligence tool(s).

Erecting the Frame

The frame of the building consists of technology elements that build on the foundation and support the Sustainability IT solution:



- Dashboards – Deliver configurable dashboards so each person can see and understand the metrics for the operations that they manage, and so performance information is quickly and efficiently communicated for each facility, region, division, business unit and other organizational levels across the enterprise.
- Data Security – Control the data available to various types of users based on their application security profile. Authenticate and authorize users to manage information that only they are responsible for with the capability to audit user actions as necessary.
- Language Support – For global deployment, data entry and reporting in local languages, as well as local date/time and number formats, is needed.

- Mobile Computing – Use handheld applications to collect field information that include capabilities like bar-code scanning and offline operation in locations where the internet is not available.

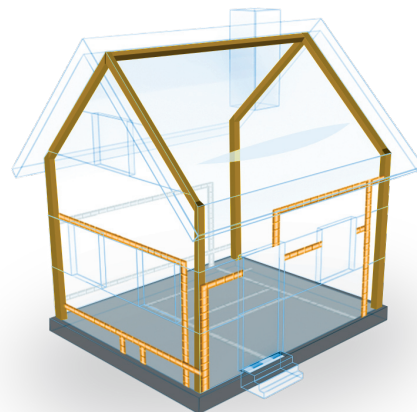
Within the IHS Essential Suite solution these technology enablers span different areas of sustainability information management.

Regardless of the topics addressed by any given implementation, these enablers and the underlying database configurations provide a solid foundation and frame.

Installing the Plumbing: Data Integration to Leverage Your Information Technology Investments

Intelligent companies are optimizing their investment in corporate responsibility and environmental, health, and safety (EHS) functions to meet multiple business objectives, particularly information management that supports reporting to stakeholders and internal governance and risk management processes.

Plant Data Systems, like process historians and continuous emissions monitoring (CEM) systems, collect and manage raw time series data needed to support certain key parts of the Sustainability IT solution. Examples of such data include fuel and energy usages, production throughputs, and pollutant emission rates. The Sustainability IT solution must be able to easily and efficiently utilize this information.



For example, companies using the ESS Gateway have a very efficient method for accessing data from their process historians to meet calculation, compliance-checking and reporting requirements. The Gateway Solution is flexible to allow the companies' subject matter experts to identify what data points to bring into the system. Data validation, data substitution, and the data approval process are all configurable by the subject matter expert in the Gateway to ensure the integrity and validity of the process data before it "hits" the Sustainability IT solution.

Enterprise Resource Planning (ERP) applications are the "system of record" for many Sustainability IT data elements. There are many opportunities to leverage IT investments in ERP for Sustainability IT initiatives.

For example, Oracle recently selected ESS to provide the detailed underpinnings of environmental compliance within their governance, risk management, and compliance (GRC) framework. KPI's can be rolled-up from operations to an enterprise level into Oracle Business Intelligence Enterprise Edition (OBIEE) for executive-level dashboarding. This effectively brings together environmental compliance and risk management with the financial information available in Oracle applications.

Room Additions: The Incremental, Modular Approach

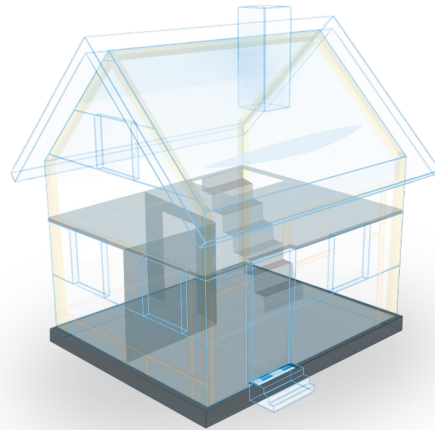
The Sustainability IT system should be modular, such that corporate priorities can be addressed in order. Priorities will range broadly across industrial sectors (e.g., upstream oil vs. mining companies), and different companies. For example, some initial priorities we have seen include implementing:

- A global Incident Management system, including Crisis notification to notify employees and their

families in cases where there are accidents or socio-political unrest.

- Global Reporting Initiative (GRI) information management and reporting, based on a combination of live data integration for some indicators such as fuel use for GHG calculations, and quarterly data submittals for others.
- Worldwide calendaring and obligation management system, starting with certain geographies (e.g., Canadian operations) and business units (e.g., upstream oil and gas), and continuing in order of priority to remaining areas.
- Employee safety management systems, including training, industrial hygiene, and workplace auditing.
- Multimedia environmental reporting including key performance indicators and compliance information for Air, Water, and Waste.

The House is Built: Do You Rent or Own?



Having both Software as a Service (SaaS) delivery and onsite, behind-the-firewall installation as options for the software platform provides flexibility for companies to choose the best option for today, and then switch between delivery models as needed in the future.

According to AMR Research, a SaaS model can provide the following EHS compliance benefits^{xxiv}:

- Shorter deployment time frames to meet an emerging compliance mandate or deadline and lower ongoing total cost of ownership (TCO).
- Application updates that do not require any coding changes at all, which is especially beneficial for organizations leveraging technology for complex emissions calculations, waste and consumption level tracking, and remediation management.
- Institutional knowledge retained despite employee turnover.
- Common processes provided for asset maintenance and inspection, reporting of best practices, and task replication, allowing higher productivity from inhouse EHS experts.

A behind-the-firewall implementation is desirable in many cases. Such cases include:

- Customers with substantial integration requirements.
- Meeting needs related to data security, where the customer has concerns about the sensitivity of EHS and sustainability-related data that make a SaaS model impractical.
- Circumstances where the customer has available internal IT infrastructure to leverage, and outsourcing hardware support isn't desirable.
- Customers who require complete internal control over other IT issues such as when application and database upgrades are applied.

Having access to both delivery models provides maximum flexibility.



Executing the Project: Keys to keeping risk low during system implementation

Implementing the Sustainability IT solution, which has many risk reduction benefits, should itself be a low risk process. To this end, it is important to follow best practices in order to ensure a successful and well-adopted system:

- **Follow a Stepwise Approach** – It is best to plan and schedule the project in a stepwise fashion, where the easiest “low-hanging fruit” goals of the project are completed early and often, and the organization is getting obvious benefits from the new IT solution every step of the way. In this manner, upper management sees tangible results that keep their enthusiasm and support for the project. Also, you avoid the very often unsuccessful “hockey stick” approach, where an implementation project plan and schedule is over-ambitiously laid out in the shape of a steep curve, and every aspect of the solution must be finished before the organization can see value from it. In “hockey stick” mode, proof of the IT solution’s worth is hard to come by, and the project is ever-increasingly at risk to lose the necessary sponsorship and budget.
- **Build Long-Term Acceptance** – One of the biggest challenges is getting end users to fully adopt the new IT solution. After all, they’re being asked to change from other systems and methods that they’re used to, and learning and understanding a new IT solution requires some extra effort and time. To overcome this challenge, it is important to fully document all the goals, steps and decisions of the project, and get a sufficient amount of representatives from all types of users to agree to and sign off on each project element. This end user involvement and sign off process should occur from the very beginning of the planning process all the way through project acceptance testing. In this way, when the system goes live, the end user community will much more quickly and readily buy-in to the new IT solution.
- **Properly Resource the Project** - Sustainability IT projects draw on both internal and external subject matter experts, with topics ranging from reporting guidelines to climate change strategy and

community relations. There are typically tie-ins with finance, HR, and operations data elements for triple bottom line reporting such as in the GRI G3 standard. Site and corporate health, safety, and environment personnel are needed to generate and interpret such data. The legal and corporate communications groups will shape how and what things must be communicated. Sustainability information management and reporting touches most functions in the company, and resources from these different areas will need to be part of the project, to varying degrees, to ensure project success.

Business Case: Providing a practical, hands-on model for justifying a Sustainability IT investment

According to a recent study, more than 80% of finance executives expect environmentally sustainable business practices to increase over the next five years.^{xv} With mounting external pressures on corporate governance, a winning business case can be made that combines greater efficiency (i.e., cost savings) with other tangible value.

The following model is useful for making the business case for an incrementally-implemented sustainability platform:

- Make the case at multiple business levels. Enterprise sustainability management can involve all levels of the business, from sites to divisions to the whole corporation. Find out what the value of the project is for individuals across all levels of the organization. For example, at the plant level, the concept of faster and more-accurate regulatory reporting provides numerous benefits. The division level benefits from automated plant data collection. Corporate personnel appreciate a dashboard view and trend analysis. Everyone involved has something to gain.
- Identify both cost savings and strategic value. Sustainability-related staffing, including EHS professional staff, is already very lean in most companies today. Your Sustainability IT project is unlikely to be justified purely on hard cost savings

such as staff reductions. Develop the business value in all of the areas mentioned within this paper, from maintaining your license to operate to increasing stock demand.

- Know and embrace your internal process. The chances are high that your company has a formalized internal process for realizing IT projects. The earlier you get to know and understand this process, the better. Use the specific business case templates provided by your company. Emphasize the project elements that align with company strategy. Be prepared to “sell” the project to internal project committee members.
- Focus on operationalizing each step. Sustainability information management is like shampooing your hair. If you work it into daily operations, things go smoothly, and nobody notices. If you only do it once per quarter, or worse, just once per year, you have a tangled mess on your hands. Annual sustainability reporting should happen naturally as a result of regular use of the IT system, rather than being a difficult, messy problem.
- Show incremental value. Realize benefits continuously throughout the project, avoiding the “big bang” approach, particularly in an economy where capital investments are scrutinized at the highest levels.

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About IHS

IHS has been in business for over 50 years, providing critical information and insight to governments and companies in a broad range of industries in 180 countries. IHS offers an integrated platform with powerful tools to help your business manage and communicate GHG data for products, supply chain and facilities from the plant floor to the boardroom. IHS software helps organizations to maintain total compliance with EPA regulations by accurately tracking refrigerant usage, leaks, and disposal. It enables organizations to support data collection and reporting for a verifiable carbon emissions inventory; enable strategy development with powerful business intelligence and analysis tools; and helps users execute carbon strategies with performance metrics, tasking and communications.

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