



THE BUSINESS OF SUSTAINABILITY

INFORMATION TECHNOLOGY AS A CATALYST
FOR SHORT- AND LONG-TERM PROFITABILITY

Sustainability is based on the understanding that economies and companies do not operate in a vacuum, but are tightly embedded into societies and the environment.



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EXECUTIVE SUMMARY

SUSTAINABILITY – CHALLENGES AND OPPORTUNITIES

Global, macroeconomic trends such as tightened government regulations in many countries, energy prices that are expected to stay extremely volatile, the globalization of employees, and sensitized customers are preparing the ground for businesses to focus on sustainability. C-level agendas are filling up with the challenges associated with managing risks and exploiting operational and business opportunities regarding social, environmental, and economic sustainability.

Sustainability is based on the understanding that economies and companies do not operate in a vacuum, but are tightly embedded into societies and the environment. The business implications of this evolved perspective are significant: In order to make sustainability tangible for the business, organizations must go beyond “being green” or philanthropic. They must focus on driving profitability, compliance, and their reputation through more sustainable and responsible behavior.

Yet, as simple as that sounds, the actual implementation of this idea comes with considerable challenges. On the one hand, there is the human side. Businesses need senior management to define and approve a core set of key sustainability performance indicators, raise internal awareness for sustainability across the company, and identify the right stakeholders and role models, all while coping with changing global standards and worker globalization. On the other hand, businesses need to be able to analyze the sustainability

of their end-to-end business processes today, develop a strategy and related targets for how to improve in the future, and eventually implement those changes over time, starting with those that have the biggest immediate positive financial impact. IT is poised to play a key role in this endeavor.

SAP is fostering an exchange with key stakeholders to challenge and guide SAP’s approach to sustainability.

For organizations to deliver on both those requirements, full transparency on all relevant data sets and the ability to act on this transparency are key. As a leading provider of business application software, SAP sees these new requirements as both an obligation to and an opportunity for our customers and our stakeholders.

THE BROAD SPECTRUM OF SUSTAINABILITY

SOCIAL, ENVIRONMENTAL, AND ECONOMIC DIMENSIONS

The “Triple Bottom Line” Definition

Sustainability has attracted increasing interest in recent years. In principle, the basic idea is as simple as it is compelling: resources may only be used at a rate at which they can be replenished naturally. It is obvious that the way in which the industrialized world operates today is not sustainable and that change is imperative.

The universally shared definition of sustainability encompasses social, environmental, and economic dimensions. More detailed aspects are shown in the table “Dimensions of Sustainability.”

C-Level Attention

Given the macroeconomic trends with regulations and the sharp volatility of energy prices, sustainability is an urgent topic on the C-level agenda, and there is a deep understanding that, in the long term, businesses can’t succeed if social, environmental, and economic risks and opportunities are not managed holistically. Companies need to not just do well, but do better by “doing good.” There is new opportunity, given recent proof supporting a strong business case that investments in sustainability lead to higher profitability.

Our customers have made it clear that sustainability is very relevant not only at times of growth, but specifically during times of economic challenge, simply because the main drivers of sustainability don’t change:

- Regulation will continue to increase. That is specifically true in the case of carbon emissions, but will likely include many other environmental and social aspects in the future.
- Energy prices will continue to fluctuate and, with economic recovery, rise sharply and increase cost pressure.
- Consumer awareness will continue to intensify and force transparency and optimization across entire business networks and supply chains.

Dimensions of Sustainability

| Social | Environmental | Economic |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> ■ Labor, health, and safety: Address occupational health, safety, working conditions, and so on ■ Human rights and diversity: Ensure compliance with human rights and organizational diversity ■ Product safety: Ensure consumer safety ■ Retention and qualification: Attract, foster, and retain top talent by fostering “green” profile | <ul style="list-style-type: none"> ■ Energy optimization: Manage energy costs via planning, risk management, and process improvements ■ Water optimization: Ensure sustainable and cost-effective water supply ■ Raw materials optimization: Control raw material-related costs and manage price volatility ■ Air and climate change: Reduce or account for greenhouse gas emissions ■ Sewage: Manage sewage emissions and impact on water supply ■ Land pollution: Avoid or reduce land pollution ■ Waste: Manage waste in a sustainable way ■ Sustainable product life cycle: Sustainably develop new products and manage life cycle | <ul style="list-style-type: none"> ■ Sustainability performance management: Provide key performance indicators to manage sustainability efforts ■ Sustainable business opportunity: Enable new goods and services for customers ■ Emission trading: Ensure financial optimization (cap and trade) ■ Reporting: Comply with external demands for adequate reporting and disclosures |

In order to make sustainability tangible for the business, organizations must go beyond being green or philanthropic. They must focus on driving profitability, compliance, and their reputation through more sustainable and responsible behavior.



These drivers can create new revenue opportunities for the business. In late 2008 GE announced that, despite economic turmoil, it would generate revenue of US\$17 billion that year from its Ecomagination program.¹ Many companies are therefore **increasing** their sustainability investments, specifically at times of economic challenge, as they see a strong business case.

Sustainability Stakeholders and the Rise of NGOs

With the sustainability conversation taking place at the C-level, corporate relationships with stakeholders are becoming more strategic in nature. Businesses recognize the value of partnering with nongovernmental organiza-

tions (NGOs) as part of their corporate strategy. Globalization, with the deregulation of markets and the proliferation of IT, is shifting the traditional roles of NGOs, governments, and businesses toward more collaborative models. As such, the importance of the role of NGOs and businesses has sharply increased.

More NGOs, such as the World Wildlife Fund and Extractive Industries Transparency Initiative, are now working collaboratively with businesses in one-to-one partnerships or multistakeholder initiatives. For example, the Global Reporting Initiative developed the world's de facto standard in sustainability reporting guidelines through a multistakeholder, consensus-seeking approach.

Institutional investors are also acknowledging the opportunities arising from sustainability. Firstly, investors believe that sustainability offers opportunity for growth. Moreover, they assume that companies that act in a sustainable way are better off in the long run. As a consequence, specialized funds, indices, and rating agencies are evolving. One of the largest intermediaries between shareholders and corporations in the field of environmental sustainability is the Carbon Disclosure Project (CDP). The CDP works together with more than 3,000 companies and over 350 institutional investors managing more than US\$57 trillion.

1. "Countdown to Copenhagen: Government, business and the battle against climate change" (2009). The Economist Intelligence Unit.

THE BUSINESS RELEVANCE OF SUSTAINABILITY TODAY

“GOING GREEN” WHILE DRIVING PROFITABILITY

Identifying the Corporate Impact

To better understand the specific challenges and opportunities associated with the broad spectrum of sustainability topics and to assess the implications for the demand regarding software and IT solutions, SAP initiated a dialogue with its stakeholders, including customers, NGOs, partners, analysts, and employees. We conducted interviews with nearly 100 leading companies and institutions in the area of sustainability, covering all major industries and regions of the world. The analysis was complemented by scientific and market data.²

Those assessments revealed that there are clear differences in how urgent and complex companies consider sustainability topics to be and in which areas companies need the most support from software and IT services providers.

Our research found that the environmental dimension is the most crucial one for businesses worldwide in the short and medium term. More than 80% of company representatives interviewed consider the topics of reducing greenhouse gas (GHG) emissions and optimizing energy management as highly relevant and very urgent for their businesses at present. Our interviewees confirmed that this assessment is valid even during the current financial crisis, as the medium- and long-term implications have not changed.

People-related topics (labor, health, and safety) and product-related topics (product safety and stewardship) also rate as highly important. For many companies, managing their human capital and

safeguarding their products' safety has been a core mission for years. Thus, software companies have successfully developed and introduced solutions to manage these challenges.

The scarcity of fresh water is perceived as an emerging topic and is expected to become a high-priority topic over a three- to five-year horizon; however, certain industries and regions see this as an imminent priority. Other environmental topics (for example, land, sewage, and waste) are also important, but are perceived by interviewees as being less urgent or less of a strategic priority.

In speaking with customers, we identified five drivers that are impacting sustainability management for businesses around the globe.

Key Business Drivers for Greenhouse Gas and Energy Management

There are various factors that drive a company toward greater sustainability. These include regulations, cost pressures, and protecting your reputation. But they also include good business opportunities that you don't want to miss.

Regulation

In the course of the Kyoto protocol, regional cap-and-trade systems have been established in several countries, forcing specific industries to disclose their GHG emissions.

Within the European Union Emission Trading Scheme (EU ETS), transparency regarding GHG has already been

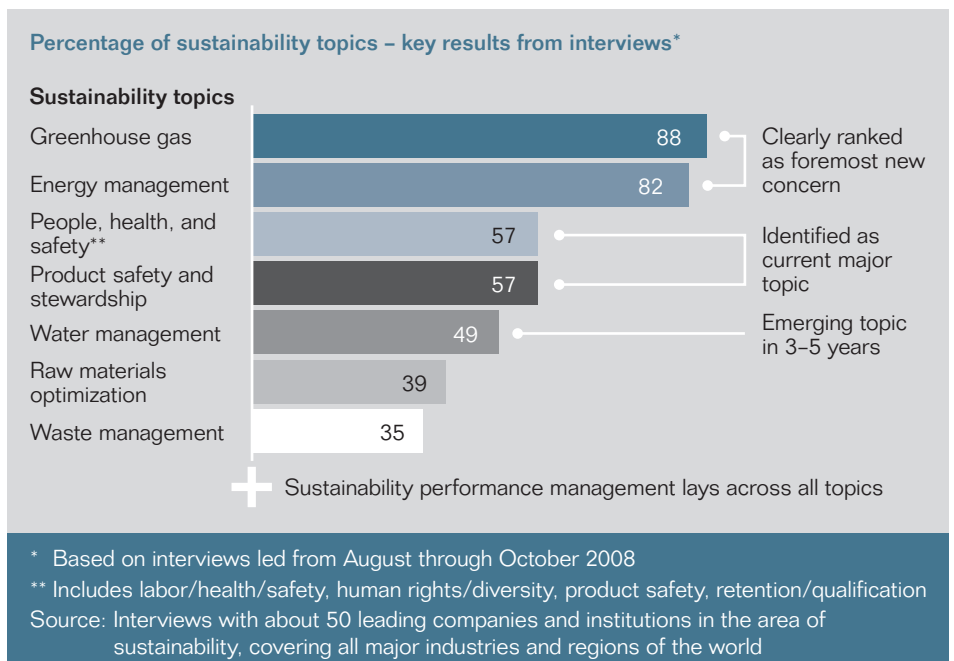


Figure: Ranking of Sustainability Topics – Key Results from Interview

2. The results from our research underline the findings of the materiality analysis conducted for the SAP Sustainability Report 2007/2008.

imposed on several industries (for example, steel, and power generation). This will most likely be expanded to further sectors in the third phase after 2012 (for example, chemical, coal mining, and aluminum). While current GHG reporting requirements pertain mostly to the company level, the next phase will focus at least partially on the product level. This will be a fairly complex task, especially when it comes to compound productions and including the supply chain.

An example of an upcoming administration promising even more rigid and comprehensive regulations is that in Australia. In July 2008 the Australian Department of Climate Change outlined its preferred position with regard to the national reporting framework. This framework is intended to support the cap-and-trade regime.³ Even though the department announced it would allow several methodologies, at least for a transition period, the overall direction points at requiring a higher level of accuracy. Directly monitoring GHG emissions that arise on an “activity level” is already one of the design details of the upcoming scheme.

In the United States, emission-trading schemes are being prepared. On the state level, the Regional Greenhouse

Gas Initiative (RGGI) is a cooperative effort by 10 Northeast and mid-Atlantic states to limit greenhouse gas emissions. Starting in 2009 the CO₂ emissions from the power sector will be gradually reduced by up to 10% by 2018.⁴ On the national level, the Obama-Biden administration is committed to implementing “an economy-wide cap-and-trade program to reduce greenhouse gas emissions 80 percent by 2050,” consistent with a pledge made during the campaign.⁵

Despite the rising number of different cap-and-trade systems,⁶ there are also plans for international harmonization in the long run.⁷ The process entails not only a greater number of industries and regions, but also a greater level of accuracy, complexity, and frequency of emissions disclosures and energy-related reporting.

Cost Pressure

Apart from regulation, costs are the main driver in improving energy efficiency and reducing emissions. For nearly two decades, companies have been finding that “eco-efficiency” (a World Business Council for Sustainable Development-coined term from 1992) can bring savings. DuPont, for example, has cut costs by US\$3 billion since 1990 through increased energy efficiency, while reducing greenhouse gas emissions 72%.

Substantial improvements can continue for a long time. Novartis AG CEO Daniel Vasella reports that Novartis, which has been increasing its water and energy efficiency for several years, considered 32 environmental projects in 2006 “which could save US\$50 million over ten years.” Multinational conglomerate 3M, after cutting energy intensity by 34% and saving US\$82 million in expenses between 2001 and 2005, achieved further reductions of 9% in 2006, saving an additional US\$10 million.⁸

With an aim to reduce current costs and avoid anticipated future costs, a clear business case needs to be in place for all planned measures to reduce GHG emissions and improve energy management, apart from activities triggered by regulation. Every industry will be affected; however, process industries and manufacturers will be predominantly affected, as production costs are directly influenced by the cost of energy and market volatility. In order to stay competitive, companies in these industries are optimizing energy management, achieving results of up to about 20%.⁹ This includes leveraging the supply chain, since for many manufacturers, the greatest energy consumption occurs upstream (for example, about 80% for consumer electronics).

3. *Carbon Pollution Reduction Scheme Paper* (July 2008) (www.climatechange.gov.au). The cap-and-trade system will affect entities with facilities that have direct emissions of 25,000 t of GHG emissions per year or more. The Australian Department of Climate Change estimates that about 1,000 entities and 75% of Australia's emissions will be included in the scheme.

4. Regional Greenhouse Gas Initiative (www.rggi.org).

5. “Organizing for America,” http://my.barackobama.com/page/content/newenergy_more.

6. Other examples of existing emission trading systems include CDM (Clean Development Mechanism) for developing countries, JI (Joint Implementation) for Eastern Europe, and JETS (Japanese Voluntary Emissions Trading Scheme) for Japan.

7. This development is also driven in the course of the Copenhagen Protocol planned for 2009.

8. “Doing good: Business and the sustainability challenge” (2008). The Economist Intelligence Unit.

9. In some industries, even higher results are feasible – for example, in mining up to 60%.

Sustainability as a Business Opportunity

"For us, sustainability is first and foremost a business opportunity," was the statement of a leading global high-tech player in our survey. Many industries have complemented their portfolio with "green" products, such as highly energy-efficient white goods and low-emission vehicles.

Exploring business opportunities around "green" is particularly interesting for companies whose own carbon footprint is relatively light and whose main contribution to a low-carbon economy involves enabling others to reduce their carbon footprint and energy consumption, thereby creating a win-win situation. Professional services (for example, energy management services) and financial services (for example, climate change funds and risk management services) are discovering climate change as a business area.

Business opportunity also exists for those companies with higher footprints. Embracing long-term sustainability goals, Wal-Mart Stores Inc. sold more than 100 million fluorescent light bulbs in 2007. Because of the company's strong supplier relationships, GE and others ramped up production of fluorescent bulbs. Wal-Mart's sustainability efforts also impact the downstream footprint of its products. By selling only concentrated liquid laundry detergent, its customers will save more than 400 million gallons of water, 95 million pounds of plastic resin, 125 million pounds of cardboard, and 520,000 gallons of diesel fuel over three years.¹⁰

Business Model at Stake

For some sectors, high energy intensity is not only a matter of regulation or cost but is also disruptive to the entire business model. This is especially true when customers either switch to green substitutes (for example, regionally grown fruits or low-energy cars) or decide to avoid buying the product or service at all (for example, long-distance travel).

The logistics sector (transport) is a good example of a business model at stake, being one of the largest emitters and accounting for about 14% of global GHG emissions.¹¹ This sector will fall under regulation in the short term¹² as business customers, forced to optimize ecobalance and costs in their supply chain, are already asking for green services.

The complexity related to this new customer demand is immense and fundamental to the business model. Logis-

tics companies will need to detail the carbon footprint per customer. "Some retailers already ask for offsetting for their total shipments," explained one of the global logistics providers interviewed. "Hence, we need to determine the exact footprint of each specific shipment, differentiated by size, weight, destination, and mode of transport." Forerunners in the logistics sector are already responding to those emerging demands with "carbon-neutral" offerings, exploring innovative shipment solutions to optimize the internal abatement potential (for example, sails attached to the front of container vessels) and providing certified offsetting options for those emissions that cannot be avoided, to guarantee the carbon neutrality of the entire shipment.

Reputation and Anticipated Pressure from Customers

Increasing consumer interest in companies' environmental performance has a

The Network Footprint

Engaging suppliers is a necessity for retailers, as their own footprints are rather small compared to the "virtual" footprint "inherited" from their network. The cost reductions along the supply chain associated with improving the energy and emission balance are certainly a welcome side effect. Wal-Mart Store Inc.'s initiative with the Carbon Disclosure Project provides the most prominent example

of supplier engagement. Additionally, the network is a strategic topic for companies to avoid reputational risks from neglecting standards. Preferences are given to suppliers and partners that account for environmental sustainability, as the relationships are perceived to be beneficial in the long run – from a cost, compliance, and reputation perspective.

10. "Green-Light Specials, Now at Wal-Mart," Rosenbloom, Stephanie, and Michael Barbaro, *New York Times*, January 24, 2009.

11. Stern Review, *The Economics of Climate Change* (2006), WRI 2006.

12. The logistics sector will soon be subject to regulation, especially when it comes to airfreight – for example, inclusion of intra-EU flights in EU ETS in 2011, to/from EU in 2012.

Going green is not just a social obligation; it's a path to profitability, competitive advantage, and a favorable positioning in the "war for talent."



major impact on corporate strategy. If companies do it right, "going green" is expected not only to translate into revenue growth, but also to enhance reputation.

Forerunners within the retail and consumer goods industries differentiate themselves with green activities, by creating transparency on product-related emissions (that is, product-level footprints) and by engaging their suppliers in improvement programs around sustainability, as noted above between Wal-Mart and its suppliers. Several companies "go green" in cooperation with NGOs. Tesco plc, for instance, is cooperating with the Carbon Trust to determine the carbon footprint of 20 own-brand products.¹³ In 2007 Marks and Spencer plc established "Plan A," a company-wide program that encompasses 100 commitments including environmental measures to become carbon neutral and addressing employee and customer interests.

The Business Aspect of Doing Good Versus Being Philanthropic

Much has been argued about the different models that define the relationship of business and society. Sustainability is moving beyond the "corporate responsibility" domain into strategic "business development," resulting in increased revenues and profits. Going green is not just a social obligation; it's a path to profitability, competitive advantage, and a favorable positioning in the "war for talent."

So what has caused this change? Globalization and environmental instability. Trade liberalization allowed the proliferation of the enterprise, and, unsurprisingly, the corporation quickly encountered widely different regulatory regimes and states with little or no regulation, especially on social and environmental issues. The philanthropic model of taking care of those in the community outside the factory gates in home markets seems tokenistic for a global

enterprise that may be enjoying the benefits of the lower costs in regulatory regimes in which employee rights and benefits are less protected.

Businesses in the 1990s attempted to build this bridge by trying to find ways to do well by doing good, to harness the force of the market to create better social outcomes. This ideology rejects the idea that profit and people are in direct conflict – at times this may be true, but at other times there may be great synergies. To meet this challenge, businesses began to think less about the social benefit and largesse of private cash donations and to think instead about mobilizing the market to address real social need.

Does business have a legitimate mandate to make a voluntary social intervention? The answer is yes, so long as it can do so in a way that is acceptable to all stakeholders (including shareholders) and creates mutual value.

13. Tesco press release from May 7, 2008.

THE DUAL ROLE OF IT

HELPING TO ENABLE SUSTAINABILITY

IT as a Contributor to Greenhouse Gas

The GHG footprint of software and IT services providers is relatively small. Estimates put 2007 GHG emissions in the whole information and communications technology (ICT) industry at 0.82 Gt (gigatonnes) – this includes computing, IT services, software, and telecoms.¹⁴ The figure represents about 2% of the global anthropogenic footprint and is expected to increase to about 3% by 2020 (1.54 Gt GHG) in a “business-as-usual” scenario.¹⁵ As the majority of emissions are attributed to hardware and telecoms, software and IT services account for only a small share of the ICT industry’s footprint, contributing to the overall picture through business travel, paper, and electricity usage.

Looking in depth at the ICT industry, the GHG footprint of products in use from software and IT service providers is around 100 times the software and IT services providers’ footprint, with data centers increasing their share of the total ICT footprint from 14% in 2002 to 18% in 2020.¹⁶ There are many ways to optimize data center energy usage, including server consolidation, data center layout, and so on. And the planning and rightsizing of data centers for optimum performance with a minimal environmental impact is at the core of green IT, supported by the platforms

and hardware that were built for this task. International retail giant Tesco has calculated that the IT contribution to the company’s total carbon footprint is only 4% – but Tesco believes that IT has the enabling potential to reduce Tesco’s total carbon footprint significantly, which in turn has financial benefits like a reduction in electricity costs and a reduction in fuel costs.¹⁷

IT as an Enabler

In comparison, it is believed that the ICT sector as a whole is able to reduce overall global footprint of businesses at a scale that’s more than five times its own global footprint by 2020.¹⁸

In consequence, the largest contribution from software and IT services providers to GHG reduction stems from enabling their customers to reduce the respective industry’s footprint, which can be achieved by enabling companies to make their data centers and, even more importantly, their business processes more sustainable.

Green IT

Like any other industry, IT must also step forward and make itself green.

Energy Efficiency as a Benchmark in Software Development

While energy efficiency has been a key differentiator for computer hardware for

some time, it has not been at the core of software development. On the contrary, new functionality sometimes even increased hardware requirements and consequently energy consumption. The software industry needs to take ownership for energy consumption as well and, as a consequence, embrace energy efficiency as a key design principle in its products.

System Landscape Optimization

Most servers in data centers are heavily underutilized; they have an average utilization of about 20% while consuming most of their energy in idle mode. The reasons for this include the following:

- Systems are sized for their maximum expected workload plus a “just-in-case” premium – which may then be used only one day a year.
- Servers that are no longer needed and that are not disposed of or redeployed can account for as much as 30% of the data center.
- Systems landscapes may have more tiers (for development, test, production, and so on) than actually needed.

Consolidating the existing system landscape by rightsizing it and retiring systems that are no longer in use increases the utilization of existing hardware and significantly increases performance and energy input. Additional consideration should be made for the consolidation of application components and

14. “How IT can cut carbon emissions,” *The McKinsey Quarterly*, October 2008.

15. “How IT can cut carbon emissions,” *The McKinsey Quarterly*, October 2008.

16. “Smart 2020: Enabling the low carbon economy in the information age,” a report by The Climate Group on behalf the Global e-Sustainability Initiative (GeSI) with independent analysis by McKinsey, 2008.

17. “Q&A: The Economics Of Green IT: What Are The Financial Benefits Of Green IT?,” Forrester Report, Doug Washburn, February 10, 2009.

18. “Smart 2020: Enabling the low carbon economy in the information age,” a report by The Climate Group on behalf the Global e-Sustainability Initiative (GeSI) with independent analysis by McKinsey, 2008.

“We believe the software industry’s most important contribution to sustainable development will be through the creation and delivery of innovative products and services that accelerate changes in how people, businesses, communities and information networks interact to achieve sustainable development.”

Cody Sisco and Danica MacAvoy, Business for Social Responsibility, *Software Accelerates Sustainable Development*, August 2008

the centralization or globalization of applications.

Virtualization

Modern virtualization technologies are the key enabler to increasing the utilization of servers and the related infrastructure. Virtualization describes the decoupling of physical and logical computer resources and can be implemented on different levels, like network, storage, central processing unit, server, and application. This results in computing resources being assigned dynamically based on the performance requirements at a given time, rather than sizing each component and each server for its expected maximum load. The ability

of customers to optimize for utilization and hence ROI will depend critically on the availability and adoption of advanced management tools.

The Role of Enabling Software

The need for comprehensive, unified solutions around sustainability topics is considerable. Solutions need to support data collection, analysis, and management in an automated, standardized, and cost-efficient way,¹⁹ with all relevant information linked into existing systems for procurement, finance, controlling, supply chain management, or delivery. To complete the strategy-to-execution feedback loop, the results should flow into established reporting and controlling structures that support management decision processes. Standardized offerings will have significant impact on cost and effect, especially with regard to complying with regulation. Enterprise software paired with business intelligence helps companies obtain resource-efficient growth and conduct.

Companies that wish to have a “balance sheet” of sustainability initiatives and impact are looking for more than numbers on a page. Those reports require an integrated enterprise system to ensure the integrity of the data, which stems from multiple areas of the business, but a sustainability software solution must reside horizontally across all key areas of the business – from finance, through procurement, to production, storage, shipping, and reclamation – in order to capture all data points and produce a holistic picture.

Greenhouse Gas

Companies need to track, measure, and comply with emissions requirements, ensuring compliance with regulations, automating data collection, emissions tracking, and calculations. This impacts all roles in the organization, from the risk management and sustainability office to the CFO and supply chain lead. Effective emissions tracking and reporting help ensure compliance and the ability to more accurately forecast emissions and ultimately manage cap-and-trade programs, minimize emissions-related costs, and improve emissions-conscious distribution and fulfillment opportunities.

Transparency on GHG Footprinting

GHG footprinting has several dimensions of complexity. Managing this complexity cannot be done in an efficient and effective way without significant software support. Enterprise software delivers much of the information and data necessary for footprinting. Tools for supply chain management and procurement are only two examples that are key for the new solution architecture. But software also has to support new requirements, like automated metering or additional data on products and raw materials.

Strategic IT Management Tools

Market interviews clearly show that there is room for improvement on management tools on several levels:

- **Cap and trade** – The need for effective cap-and-trade management systems is already clear. By 2020 financial analysts predict a carbon-trading market valued at US\$1 trillion a year.²⁰ Managing GHG certificate

19. Standardization is very useful as (emerging) regulation imposes industry-wide standards and product stewardship demands overall comparability.

20. “Greening US likely to create huge carbon market,” Brahic, Catherine, *New Scientist*, February 15, 2008.

trading effectively avoids penalties and costs, but companies have the potential to do more. By effectively managing certificates and optimizing decisions around production, energy usage, and external investments, companies can capture potential revenues.

- **Key performance indicators (KPIs) and dashboards** – Market interviews have made it clear that, in the context of GHG, there is a lack of effective tools for setting KPIs, defining and tracking reduction programs, and supporting management decisions. State-of-the-art software tools of today are effective in supporting performance management in other areas but have to be extended to include GHG.
- **Reporting** – A company needs to report its GHG footprint in an auditable way for both external and internal stakeholders. Different stakeholders require different standards and sometimes different methodologies. In cases in which financial institutions

are focusing on “carbon risks,” certification institutions will look for a much more detailed picture, and governments will push companies to meet reduction targets.

Energy Management

Successful energy management requires analytical and modeling tools that make optimization possible.

Energy Analytics and Accounting

There is a need for transparency and analytics across all industries – giving organizations the power to have the visibility and insight into energy usage so as to optimize behavior. The challenge in creating transparency is breaking down overall energy bills to a process level. This challenge is similar to that of accounting in finance and controlling, which led to enabling software in the late 1960s. What are the energy costs of any given production process? Many companies are currently unable to answer this question.

Energy Management and Optimization

In order to optimize energy consumption in operations, management needs modeling tools to identify more cost-effective approaches on the basis of clear trade-off decisions. Information is needed, and activities must be tracked on very granular process and time levels. However, specific management dashboards and clearly defined KPIs, such as energy consumption per production process or per square mile, are currently not supported by the available software tools.

Managing energy supply by trading and hedging is another key lever in optimizing energy cost. Although this is not absolutely new to many energy-intensive industries, the link to optimization approaches is not available today. Combined with a real-time database, this link would make trading and hedging even more powerful.

SAP Advanced Metering Infrastructure Lighthouse Council

SAP and seven participating utility companies formed the SAP Advanced Metering Infrastructure (AMI) Lighthouse Council to address AMI from the back office to the meter, with the objective of integrating the SAP for Utilities solution portfolio with market-leading AMI systems. The SAP AMI Lighthouse Council has been shaping the integration of SAP® solutions with

AMI solutions for business processes, including customer relationship and billing and enterprise asset management. With AMI technologies and their integration with SAP software, utility companies can improve energy efficiency and increase service reliability, optimize asset utilization, and improve service to their customers.

The potential cost savings are huge. Case examples show that, by creating transparency, software helps to identify levers to reduce direct energy cost as well as costs within the supply chain. Energy cost can be reduced by up to 20%, accounting for energy cost savings of up to US\$357 billion per year in manufacturing industries.

Environment, Health, and Product Safety

Environment, health, and safety (EHS) is more than just tracking injuries and incidents. It's about monitoring and reporting data about product safety, workplace safety, and environmental protection. Too often, companies assume these business processes are disconnected and allow local solutions to be developed. There is a great opportunity to bring visibility across the organization to these processes. For example, the development of a product could use materials that require additional ventilation or waste neutralization in the plant. A connected business process allows rapid communication and tracking of progress.

Product safety is a complex topic that reaches across the whole value chain, from supplier to manufacturer to customer and anyone else potentially exposed to a product at any point. A current issue is a new regulation requiring the reporting of chemical substances produced or imported into Europe. This new legislation, called REACH (Registration, Evaluation, Autho-



rization, and Restriction of Chemicals), requires producers to track the quantity and document the safety of all products. Originally aimed at the chemical industry, interpretation of the regulation has expanded the REACH applicability to the high tech, consumer products, and pharmaceuticals industries. This regulation could cause a significant amount of work needed to gather and report this information. Companies with a common data repository or integrated ERP system will have a much easier time with compliance.

Sustainability Performance Management

Customers need a way to track, report on, and evaluate sustainability performance across the organization, syndicating corporate sustainability perfor-

mance data for reporting that captures GRI sustainability indexes and industry-specific extensions.

With increasing market forces, it is imperative not just to link sustainability performance and business strategies, but to also integrate the two facets of the business to identify, monitor, and mitigate risks. Additionally, companies need to ensure that policies are articulated and enforced, additionally linking sustainability with risk management to assess risk probability, expected loss, and risk response plan. Sustainability performance management tools can help companies set and monitor goals to improve sustainability performance year after year as well as understand the financial costs and benefits of improving sustainability performance for the enterprise.

SAP'S APPROACH AND COMMITMENT TO SUSTAINABILITY

MINIMIZING OUR FOOTPRINT AND HELPING YOU ACHIEVE SUSTAINABILITY

“SAP is in a unique position when it comes to sustainable development. Along with ensuring that our business operates in a sound and ethical manner and leaves a minimal environmental footprint, we are also responsible for providing technology solutions that help businesses better manage their sustainability performance. We aspire to take a leadership position by addressing social, environmental, and governance challenges on a global scale – and ensuring that sustainability continues to be an intrinsic part of SAP's corporate and solution strategy.”

Léo Apotheker, Co-CEO, SAP AG

SAP as an Exemplar

In mid-November 2008 SAP released its first sustainability report, highlighting the key measures of SAP's corporate environmental, social, and governance performance as well as its products and services that help enable more sustainable operations of its customers. The report tracks SAP's footprint in areas such as facilities management, business travel, water use, and waste management.

The *SAP Sustainability Report 2007/2008* is an important step in the company's ongoing dialogue with stakeholders regarding how SAP can best perform as a company, build software solutions that promote sustainable operations for customers, and play a leading role in the public policy debate.

Based on its successful working model of collaboration and co-innovation – and acknowledging that the topic of sustainability requires both transparency and stakeholder engagement – SAP has issued an open call for dialogue to define the company's top corporate sustainability issues as well as product and service solutions.

Using Web 2.0 tools, SAP is fostering an exchange with key stakeholders to challenge and guide SAP's approach to sustainability. Interested parties can log on to the Collaboration Workspace from SAP site to share their views on

SAP's sustainability efforts, secure feedback directly from SAP, and interact with other like-minded stakeholders.

Socioeconomic Development

Today more than 4 billion people live on less than US\$4 per day and remain largely excluded from meaningful participation in markets. This represents a great threat to sustainable development, but it also represents a significant opportunity. We see business model innovation where there has been success – for example, in mobile telephony – but in many cases economic development and market penetration has been slow, especially for those at the bottom of the economy or at the “base of the pyramid.”

The main barriers have been identified as lack of operating credit, poor infrastructure, lack of business education and skill, maladapted distribution systems, and underdevelopment of regulatory institutions. After more than 50 years of direct foreign aid, international development experts such as the World Bank, the International Finance Corporation (IFC), the United Nations Development Programme (UNDP), the United Kingdom Department for International Development (DFID), and the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) are increasingly looking to tap the private sector and the innovation of business models and processes to help drive economic development for the poorest. As a technology player of global strategic

import, there is stakeholder expectation that SAP can contribute toward the innovation of business processes to extend market reach to those at the base of the pyramid.

The Harvard Kennedy School, observing SAP's current support to enable the Extractive Industry Transparency Initiative, notes that the technology sector mobilizes innovation in an ecosystem to expand the reach of knowledge and share development risk. SAP can play a unique role in microeconomic development, extending the value chain of our most important global customers through the application of microcredit, technology, best practices, education, and civil society engagement.

Minimizing the Energy Footprint of SAP® Solutions

For more than 35 years, SAP has defined business application software and has helped companies of all sizes manage resources effectively and responsibly. With approximately 82,000 customers today, SAP is very aware of its responsibility and the impact it can have on environmentally sustainable operations of data centers all over the globe.

In addition to this, we will also help to reduce the footprint from products in use. We will also offer a portfolio of green IT services, not only for system landscape optimization and total cost of ownership reduction, but also including business transformation, dashboards, and IT architecture. This high-value portfolio of services will be complemented with the expertise of our strategic partners. Together with its technology

partners, SAP will help ensure that the hardware will be optimized to run SAP® solutions in the most efficient way.

We will increase our efforts to design our software slimly so that it easily leverages innovative optimization technologies like virtualization and uses less computing resources. We will determine the key energy consumers of SAP software and their energy consumption behavior. Based on the results, programming guidelines and architectural design recommendations will be established and adopted for all new and existing applications. In addition, SAP is driving a benchmarking initiative together with its technology partners, to agree on a common methodology for measuring power consumption, enabling customers to choose the most energy-efficient hardware setup.

Furthermore, we have already developed a broad set of software as a service solutions, reducing the footprint of our software. The vision is to design and deliver business processes in the most energy-efficient way.

SAP Solutions for Profitable and Sustainable Growth

We strive to leverage our experience regarding industry best practices and business processes to support our customers throughout the sustainability journey.

SAP can help customers today with their sustainability initiatives in many ways, but focuses efforts on the following facets of sustainable business:

- Health and safety
- Environmental protection
- Product safety and stewardship
- Resource efficiency
- Sustainability performance management

SAP Business Suite software provides many ways for customers to address their sustainability initiatives, whether it is managing their extended supply chain, managing their human capital, or managing risk and compliance. Customers looking to increase efficiency in the supply chain can do so by leveraging the SAP Transportation Management application. This application enables enterprises to gain supply chain-wide visibility to better manage the complete life cycle of transportation management, from dispatch to delivery.

We also help our customers with their many needs for managing compliance and product safety, worker safety, and environmental protection through the SAP Environment, Health, and Safety Management (SAP EHS Management) application and SAP Recycling Administration application:

- Environment, health, and safety functionality helps you manage occupational health, worker safety, incident management, and other business processes related to ensuring a safe working environment for employees.
- Emissions management functionality lets you manage compliance with permits for air, land, and water discharges, documenting compliance with regulations.

- REACH and product compliance functionality ensures documented and accurate work processes to comply with material safety regulations such as REACH, the Restriction of Hazardous Substances Directive (RoHS), and the Waste Electrical and Electronic Equipment Directive (WEEE).

“The number-one goal was to comply with regional regulations. But any smart company also wants to comply in an effective business manner.”

Anthony Patalocchi, Business Process Manager, EHS and Compliance, Rohm and Haas Company

Further, SAP software enables companies to respond to their stakeholders' demands for evidence of effective, profitable, and ethical business operations through the SAP BusinessObjects™ governance, risk, and compliance (GRC) solutions. The GRC solutions promote corporate accountability and allow processes and strategies to be evaluated within the company and extended to partners, suppliers, and customers – truly representing the reach of the enterprise. The GRC solutions include the SAP BusinessObjects Risk Management application, allowing an overall approach for risk identification and mitigation.

SAP® Solutions in Practice: Registration, Evaluation, Authorization, and Restriction

Software applications can also help companies manage their core sustainability initiatives (around compliance, energy, and safety), with substantial financial benefits. SAP is committed to addressing a broader scope of emerging topics in the area of sustainability, built into core processes for the respective industry and based on our extensive industry and business process expertise. Integration into core management processes and the software solutions supporting them creates tremendous value add.

Rohm and Haas Company, a global provider of innovative technologies for the specialty materials industry, knows the importance of complying with Europe's new Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) legislation. In fact, for several years Rohm and Haas has been actively preparing for this complex set of regulations that requires companies to register safety information about the chemical substances they manufacture or import within the European Union. With some 20 manufacturing facilities and about US\$2 billion of revenue in Europe, Rohm and Haas also knows the cost of noncompliance: no data, no market.

In the past, Rohm and Haas typically handled regional import restrictions with a combination of system and manual processes. However, to efficiently comply with REACH compliance, the company needed a better way to track the total volume of each of the approximately 400 chemical substances that make up the company's finished products. For Rohm and Haas – with its extensive SAP® software landscape – the solution was as clear as the risk. Substance volume tracking functionality provided as part of the company's SAP Environment, Health, and Safety Management application could deliver the necessary visibility. Further, the software offered tight integration with the company's existing materials management functionality and product composition data.

Because SAP applications are integrated, they break down barriers, increasing efficiencies across different regulations and mandates.



Because SAP applications are integrated, they break down barriers, increasing efficiencies across different regulations and mandates. These applications reach into existing SAP and non-SAP software to embed compliance functions across the enterprise and beyond, giving businesses the real-time visibility they need to ensure effective business operations and corporate accountability.

SAP will further develop the solution portfolio to match the business needs of its customers. Enterprise software paired with business intelligence will help companies obtain resource-efficient growth, conduct responsible business practices, and increase accountability and responsiveness. We will leverage

existing solution elements and our EHS offering as well as our deep process know-how, to provide an integrated solution that transforms existing ERP systems into “environmental resource planning” systems.

A Sustainable Ecosystem

Working together with our ecosystem of customers, partners, and stakeholders, SAP promotes co-innovation and collaboration, to expand the reach and impact of business solutions for sustainability.

Customers demand a sustainability ecosystem that includes independent software vendors, content partners, experts, NGOs, system integrators,

and hardware vendors. A complete sustainability solution requires functionalities and content beyond what SAP can provide alone. We need technology and hardware providers to complement software solutions and the right channel partners to significantly increase integration with the business. The SAP community can foster the necessary collaboration and co-innovation, resulting in strong network effects for our customers and their networks.

SAP also offers its partners a joint dialogue and an active part in the process of shaping further standardization of methodologies and validation of collected data.

THE ROAD AHEAD

MAKING A PLAN AND TAKING ACTION

The road to sustainability is being paved at the current time, but there is not one organization that knows all the answers. Whether you are embarking on the achievement of your sustainability plan or adjusting a plan that is already in place, we offer the following suggestions to get the most impact from your efforts:

- **Assess your organization and make a plan** – Get a basic understanding of what a business case for sustainability for your company must comprise. Remember that such a case should combine social, environmental, and economic considerations. With that basic understanding, you can see where opportunities exist to improve and be most effective.

- **Measure your business activities** – Set a baseline of data for current activities, so you know when and where you are improving. Include your network of partners and suppliers in the measurement process, to increase the footprint of your efforts. Some businesses even include their customers and their usage and disposal of products.
- **Take action** – Execute on your plan and measure every step of the way. This includes involving employees in engagement programs, which makes them part of the effort.
- **Monitor and adjust** – Learn from your experience and look for additional means of achieving sustainability throughout your organization and ecosystem.

Compared to the challenges we are facing, our journey toward a sustainable future has just started. Clearly, this is a journey that requires strong partnerships. SAP is reaching out to partners, customers, investors, and NGOs to enter an open dialogue and to work hand in hand on the further elaboration of challenges and opportunities arising from sustainability.

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