((LEADING PRACTICE

INITIAL STEPS TO DEVELOPING A SUSTAINABILITY FRAMEWORK

Detailing business and IT requirements to creating a holistic Sustainability Framework

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FOREWORD OF THE AUTHOR

While economies are crumbling and markets are changing, customer are changing their demands as well. One of the biggest changes in customer demand is the need to be 'Sustainability' focused. A new research1 on this subject from UN Global Compact, underpins that 93 percent of 766 global CEOs surveyed believe that sustainability is critical to the future success of their companies. In fact, 80 percent of them said the global economic downturn accelerated their conviction to embrace sustainability practices in order to differentiate in the market. Three years ago, when a similar survey was conducted, that number was only 50 percent.

However, the research identifies four things hindering executives' appetite for sustainability initiatives:

1. Complexity in integrating multiple sustainability aspects across business functions.
2. Link to strategy is difficult to establish
3. Incorporate sustainability into the Business Model

Other key findings:

- 87 percent of the executives said concerns over an integrated sustainability approach led them to take a longer term view of their business.
- 84 percent said the potential for revenue growth and cost reductions was one of their biggest motivators for a corporate sustainability initiative.
- 72 percent said performance measures is the most important development issue they face.

As the Authors of this paper believe that sustainability is not a new subject anymore, but rather a mature subject that many organizations do struggle to implement. This is due to complexity of the subject and they don't know how they can incorporate sustainability into the Business Model, link sustainability to their strategy, develop the right performance measures and incorporate it into their operation. What is however more troubling for us, is the fact that nearly all organizations have challenges with the fact that there doesn't exist any integrated sustainability approach/framework and that this leads the companies to hold back.

Therefore is it the goal of this paper to gather and outline and detail both business and IT requirements and models to a holistic Sustainability Framework that incorporates the link to business model, strategy map, core critical and differentiated competency development, value and performance drivers, balance scorecard, maturity benchmarking, sustainability policies, guidelines, standards and measurements as well as IT enabled sustainability aspects.

We do not claim to be including all aspects or that what we have included is the only right view, but we do this to start a Sustainability Framework that can be changed, altered and improved as things get more mature. We do this as we deeply believe that our future depends on companies ability to adopt sustainability to create value for its shareholders and society by maximizing the positive and minimizing the negative effects on social, environmental and economic issues and stakeholders to grow revenue, reduce cost, manage risk and build intangible assets. When we all work toward creating

1 "A New Era of Sustainability: UN Global Compact, CEO Study 2010-2012"

a greener, smarter and cleaner planet, there is no way that anyone of us can get there alone. Nobody can win without us all winning!

INTRODUCTION

The world is currently changing at an increasingly rapid pace, driven by "megatrends": deepening globalization, large scale population trends, accelerating technological progress, the "Consumer," the corporate social responsibility imperative and growing political uncertainty.

These trends are forcing companies to innovate and refine their fundamental business models. Below are some examples that create a sense of urgency for action on Sustainability:

1. Examples of big problems that have arisen at companies (especially competitors) because of lack of attention to sustainability.
2. Examples of big successes companies (especially competitors) have realized – because they addressed sustainability concerns proactively.
3. Audit or consultant´s reports identifying legal and other sustainability risks within the company.
4. Survey results, quotes, or views of employee groups, customers, investors, or other important stakeholders indicating the company´s responsibility for sustainability is important to them.
5. Performance results on sustainability-related metrics showing serious problems or the opportunity to realize significant value if best practices are adopted across the company.
6. Examples of how a proactive approach on sustainability can help the company deal with its current financial, reputational, or other crisis.
7. Benchmarking information showing that the company is significantly behind industry peers regarding sustainability infrastructure and performance.
8. Business risks or missed opportunities that will threaten the company due to sustainability trends[2] unless action is taken.

Investment promotion agencies and economic development organizations must not only deal with all those changes, but also with more intense competition.

To do so, they need to understand their clients, public growing environmental awareness and competitors, and respond effectively. With the public's growing environmental awareness, consumers are actively seeking "greener" and more sustainability options. Regulators and legislators are changing the landscape for environmental reporting, compliance, and transparency.

Consumers, regulators, and shareholders are based on climate change and consumers demand all clamouring for sustainability. Climate change is a top priority.

2 The U.N Millennium Development Goals declaration (MDG)

Many companies are required to act due to:

- **Regulation**. Unpredictable risks, in particular political uncertainty, loom in the background in several countries, specific industries that must disclose greenhouse gas (GHG) emissions due to new regional cap-and-trade systems. Under the European Union Emission Trading Scheme3 several industries are already making transparent their emissions. Regulations4 will likely expand to new industries and will become increasingly rigid and comprehensive.

- **Cost Pressure**. After nearly two decades, companies now realize that "eco-efficiency"5 brings cost savings. Businesses will focus on reducing GHG and on improving highly correlated energy management with the aim of reducing current costs and avoiding anticipated future costs, including the impact of cap-and-trade systems6.

- **Sustainability as a Business Opportunity**. "For us, sustainability is first and foremost a business opportunity" was the statement of a leading global high-tech vendor in a 2008 SAP survey7. The view is consistent with companies that now see "green"–especially low carbon–products as an opportunity to create competitive differentiation. Create value for its shareholders and society by maximizing the positive and minimizing the negative effects on social, environmental and economic issues and stakeholders to grow revenue, reduce cost, manage risk and build intangible assets.

- **Business Model at Stake**. For many industries, reducing greenhouse gasses will not only be a matter of regulation or cost, but is also critical to the survival of the business model. For example, the logistics sector8 accounts for 14 percent of global GHG emissions. Broadly speaking, sustainability impacts supply, demand and changes rules of the games in company's business models. The industry will likely fall under regulation in the short-term, and customers will soon ask specifically for "carbon neutral" services.

- **Reputation and Anticipated Pressure from Customers**. Customers are increasingly interested in the environmental performance of companies and are leveraging greater connectivity to put pressure on the retail and consumer goods industries. Some companies are already creating transparency on product-related emissions and engaging suppliers to improve their carbon posture. Corporate social responsibility has evolved from a voluntary add-on to a corporate imperative that is rapidly changing the business landscape.

3 The European Emission Trading Scheme Put to the Test of State Aid Rules, NCCR Trade Regulation Working Paper No. 2007/34.

4 - Questions and Answers on the Commission's proposal to revise the EU Emissions Trading System, MEMO/08/35, Brussels, 23 January 2008

- Limiting global climatechange to 2 degrees Celsius - The way ahead for 2020 and beyond, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, Brussels, 10 October 2007.

5 eco-efficiency a term coined by the World Business Council for Sustainable Development in 1992.

6 Öko-Institut report: "The environmental effectiveness and economic efficiency of the EU ETS WWF November 2005

7 Global SAP AG high-tech vendor survey, 2008

8 Questions and Answers on Emissions Trading and National Allocation Plans for 2008 to 2012 EU November 2006

THE CLIMATE CHANGE STORY IN A NUTSHELL	
2-3°C	Is the maximum amount of global warming scientists believe we can afford without running into a major catastrophe.
-450 ppm	Is the atmospheric concentration of greenhouse gasses that we must not exceed to stay below 2-3°C. Today, we have 384 ppm, growing by a 2.5 p.a. in BAU (business as usual), and leading to a great 5°C temperature increase in BAU (which would be devastating).
5 Gr CO_2e	Is the maximum amount of annual man-made greenhouse gas emission the earth is able to absorb. Any higher figure adds ppm.
45 Gt CO_2e	Are our emissions today, increasing to 70 to 80 Gt CO_2e in a BAU outlook for 2050.
20 Gt CO_2e	Is the emission level we need to achieve in 2050, corresponding to 50% reduction vs. the emission level of 1990. This has been endorsed by G8 leaders (though 1990 base year is discussed). For industrialized countries, this means 80% reduction, as they have a higher starting point.
1:10	Is the ratio of cost of mitigation vs. cost of the damage that the economist Nick Stern ("Stern Review") has calculated. Actually, climate change is seen more and more as a "win-win" as it also helps address the energy and economic development agenda.

Source: IPCC, Climateworks[9],

9 - Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Core Writing Team, Pachauri, R.K. and Reisinger, A. (Eds.), IPCC, Geneva, Switzerland
- The Climate Group's SMART 2020 report, researched by McKinsey and Company

WHAT IS SUSTAINABILITY?

What is sustainability from a business perspective?

Sustainable business development, also called green business, is a broad, dialectical concept that balances the need for economic growth with environmental protection and social equity. The term was first popularized in 1987[10] by the World Commission for Environment and Development (WCED). The WCED described sustainable development as development that met the needs of present generations without compromising the ability of future generations to meet their needs. Or, as described in the book, it is "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations." Sustainable business development is a broad concept in that it combines economics, social justice, environmental science and management, business management, politics and law.

In Mel Wilson, doctoral research[11] at the University of Calgary he argues that Sustainable business development a dialectical concept is, in that, like justice, democracy, fairness, and other important societal concepts, it defies a concise analytical definition, although one can often point to examples that illustrate its principles. In *Our Common Future*[12], the WCED recognized that the achievement of sustainable development could not be simply left to government regulators and policy makers.

Sustainable business is a company that has no negative impact on the global or local environment, community, society, or economy, a business that strives to meet the triple bottom line. Often, sustainable businesses have progressive environmental and human rights policies.

In general, business is described as green if it matches the following four criteria[13]:

1. It incorporates principles of sustainability into each of its business decisions.
2. It supplies environmentally friendly products or services that replace demand for non-green products or services.
3. It is greener than traditional competition.
4. It has made an enduring commitment to environmental principles in its business operations.

Borden, Chu, Fishman, Prospero, and Sacks[14] point out that sustainability spurs innovation in everything, from how you see your business model to how your work with your employees. A sustainable business is any organization that participates in environmentally-friendly or green activities to ensure that all processes, products, and manufacturing activities adequately address current environmental concerns while maintaining a profit. In other words, it is a business that can maximizing the positive and minimizing the negative effects on social, environmental and economic issues[15] and stakeholders to grow revenue, reduce cost, manage risk and build intangible assets.

10 Wilson, M., Corporate sustainability: What is it and where does it come from?, IVEY MANAGEMENT SERVICES, 2003

11 Our Common Future, a book published by the World Commission for Environment and Development (WCED), Oxford University Press, 1987

12 Scott Cooney, author of Build a Green Small Business: Profitable Ways to Become an Ecopreneur (McGraw-Hill, November 2008

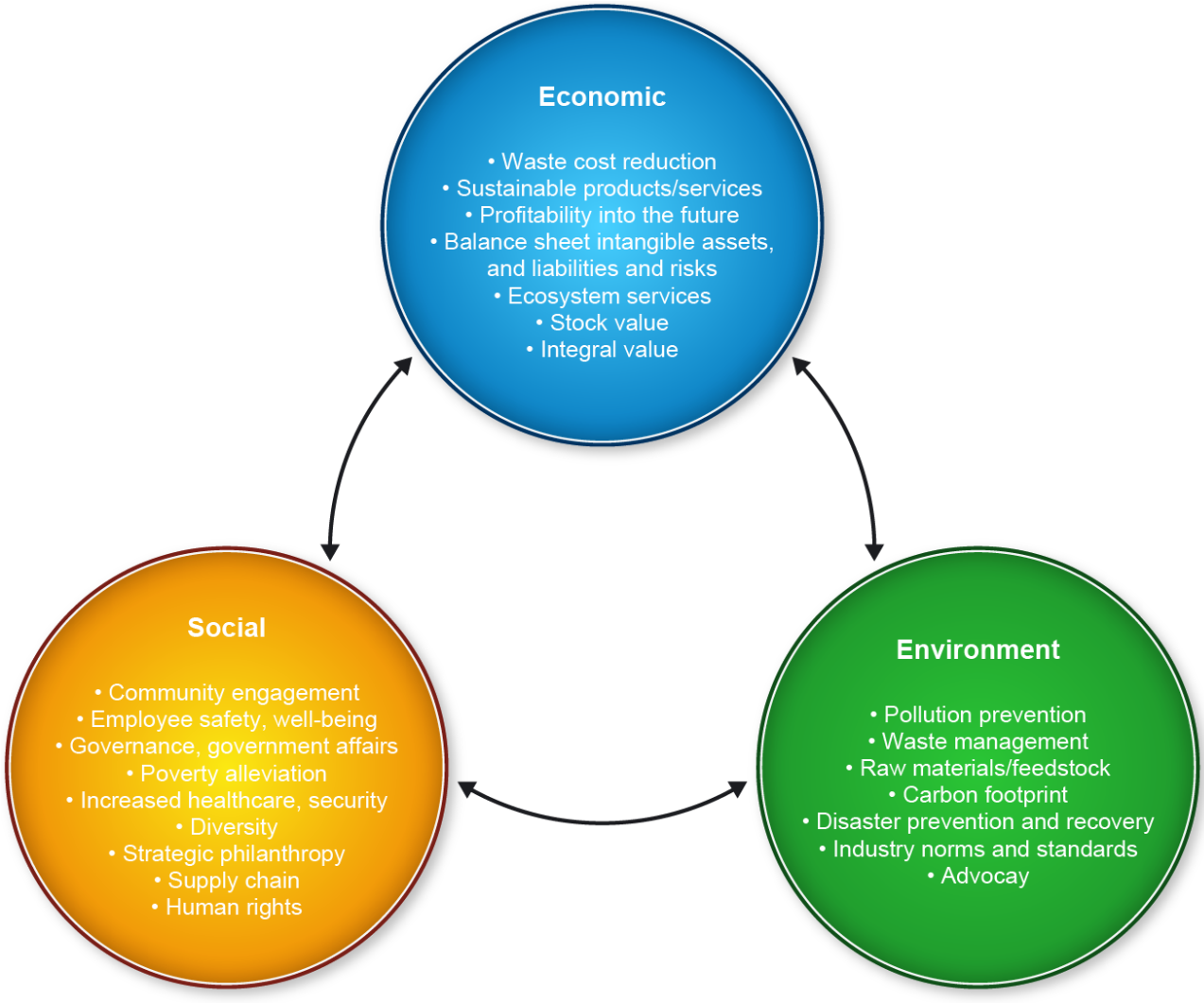
13 Wilson, M., Corporate sustainability: What is it and where does it come from?, IVEY MANAGEMENT SERVICES, 2003

14 Borden, Chu, Fishman, Prospero, and Sacks point out in their article 50 Ways to Green Your Business in November 1, 2007

15 Öko-Institut report: "The environmental effectiveness and economic efficiency of the EU ETS WWF November 2005

Rennie[16] argues that it even incorporates the process of assessing how to design products that will take advantage of the current environmental situation and how well a company's products perform with renewable resources. He further more argues that sustainable development within a business can create value for customers, investors, and the environment. A sustainable business must meet customer needs while, at the same time, treating the environment well.

Within more academic management circles Elkington[17] developed the concept of the Triple Bottom Line which proposed that business goals were inseparable from the societies and environments within which they operate. Whilst short-term economic gain could be chased, a failure to account for social and environmental impacts would make those business practices unsustainable. Developing a Business Model for Sustainability Management, should therefore consider economic profitability, environmental soundness and social responsibility.



((o))LEADing Practice of the Sustainability Reference Framework

Source: www.LEADingPractice.com

16 Rennie, E. (2008). "Growing Green, Boosting the bottom line with sustainable business practices." APICS Magazine. Vol. 18, no. 2

17 Elkington, J., The Triple Bottom Line of 21st Century Business, 1999, Cambridge University Press

Sustainability business model focus and objectives:

- An advanced management through social responsibility and ethical management
- Integrated management of economic, society & environment
- Raising consciousness and status through sustainability management
- Raising images of advanced structures and increasing publicity effects

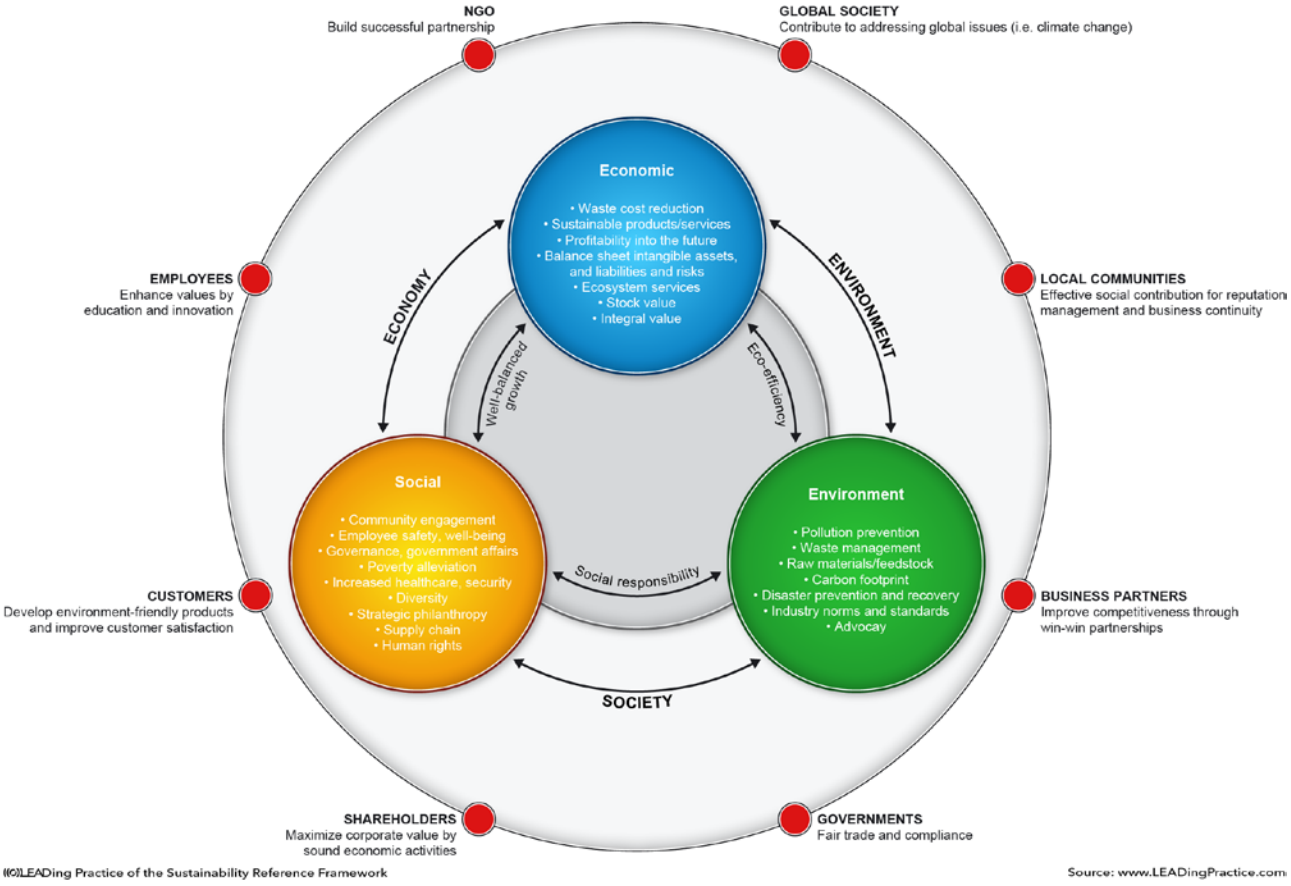
Sustainability Focus	Sustainability Objectives	Internal (Company) Aspect	External (Societal) Aspect
Economic	Wise use of economic resources	Achieving economic success of company	Achieving economic prosperity of society
Environmental	Wise use of natural resources	Leaving enough resources to meet current and future needs of the company	Leaving enough resources to meet current and future needs of society
	Respect for living things	Treating living things with respect within company operations (e.g. respecting animal rights, etc.)	Protecting ecosystems so living things can survive in the environment
		Preventing and controlling pollution within company property (sometimes considered part of social sustainability)	Preventing and controlling pollution of the external environment
Social	Respect for people	Respecting the needs of people inside the company	Respecting the needs of people outside the company

Source: Mark von Rosing, LEADing Practice

In a world with rapidly expanding requirements and a critical need to find solutions to strategic alignment of sustainability challenges, we are defining a Business Model for Sustainability that incorporates Economic, Environmental and Social aspects all to enhance eco-efficiency, social responsibility and well-balanced growth.

In order to include:

- Corporate social responsibility and ethical management
- Practical business of the Climatic Change Convention and training the experts
- Making report of sustainability management
- Management strategy of social responsibility
- Establishment of sustainability management strategy
- Establishment of Eco-Industrial Park and training the experts
- Research on model of Eco-Industrial Park
- Diagnosis & evaluation of sustainability management
- Development on consulting techniques of sustainability management
- Benchmarking of sustainability management



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What should a Business Sustainability Framework include?

A Business Sustainability Framework would both have to include satisfying what the present generation wants without decreasing opportunity that can satisfy what the next generation wants. Business Sustainability Management is what integrates management strategy and operational activities in corresponds with wants of the interested parties, protecting human resources and natural those necessary for future business activity and operation.

Understanding your sustainability personality

Through conversations in our global sustainability research, with business decision-makers, IT and sustainability owners, four predominant Sustainability Personalities emerged. These Sustainability Personalities are built from two areas. The first area concerns Sustainability attitudes and intention, or the range of sustainability approaches businesses and take toward environmental issues. The second area examines implemented Sustainability activities/initiatives – which ones businesses have adopted, and the rationale for adoption.

The Sustainability Personality Matrix plots Sustainability Attitudes and Intentions on the vertical axis, and the Sustainability activities/initiatives on the horizontal. The four Personalities are Sustainability awareness, understanding, acceptance or commitment. Read on to understand each personality, and where your department fits. Then, understand the steps required to move forward with Sustainability in your organization.

Which green personality is your company?

Does your company have:

- The environment typically as a secondary consideration?
- Has your organization initiated sustainability initiatives, but you aren't sure what the next best step is?
- Has senior management team hasn't made an environmental mandate/priority or have they just recently established initial sustainability goals?
- Your organization has just initiated recycling policies?

*If **yes**, your business most likely has Sustainability Awareness.*

Does your company have all the mentioned points/initiatives above, plus:

- Does your company have a sustainability strategy?
- Do you have several sustainability initiatives already underway or piloted?
- Has IT has taken advantage or piloted, sustainability IT processes initiatives that decrease IT's operational costs and lessen investments in your infrastructure?
- Has employees been engaged at your company to keep sustainability policies and procedures

*If **yes**, your business most likely has Sustainability Understanding.*

Does your company have all the mentioned points/initiatives above, plus:

- Does your company have sustainability portfolio management?
- Does your company have sustainability performance management, where they manage environmental, social, and economic risks and opportunities and where they can define and cascade goals and build the right performance metrics from Strategic Business Objectives (SBOs), Critical Success Factors (CSFs) and tie them to sustainability Key Performance Indicators

(KPIs) and Process Performance Indicators (PPIs) all to give the right performance metrics to the wanted sustainable business model management and sustainability management system?

- Does your company have a continuous sustainability improvement initiative?

*If **yes**, your business most likely has Sustainability Acceptance.*

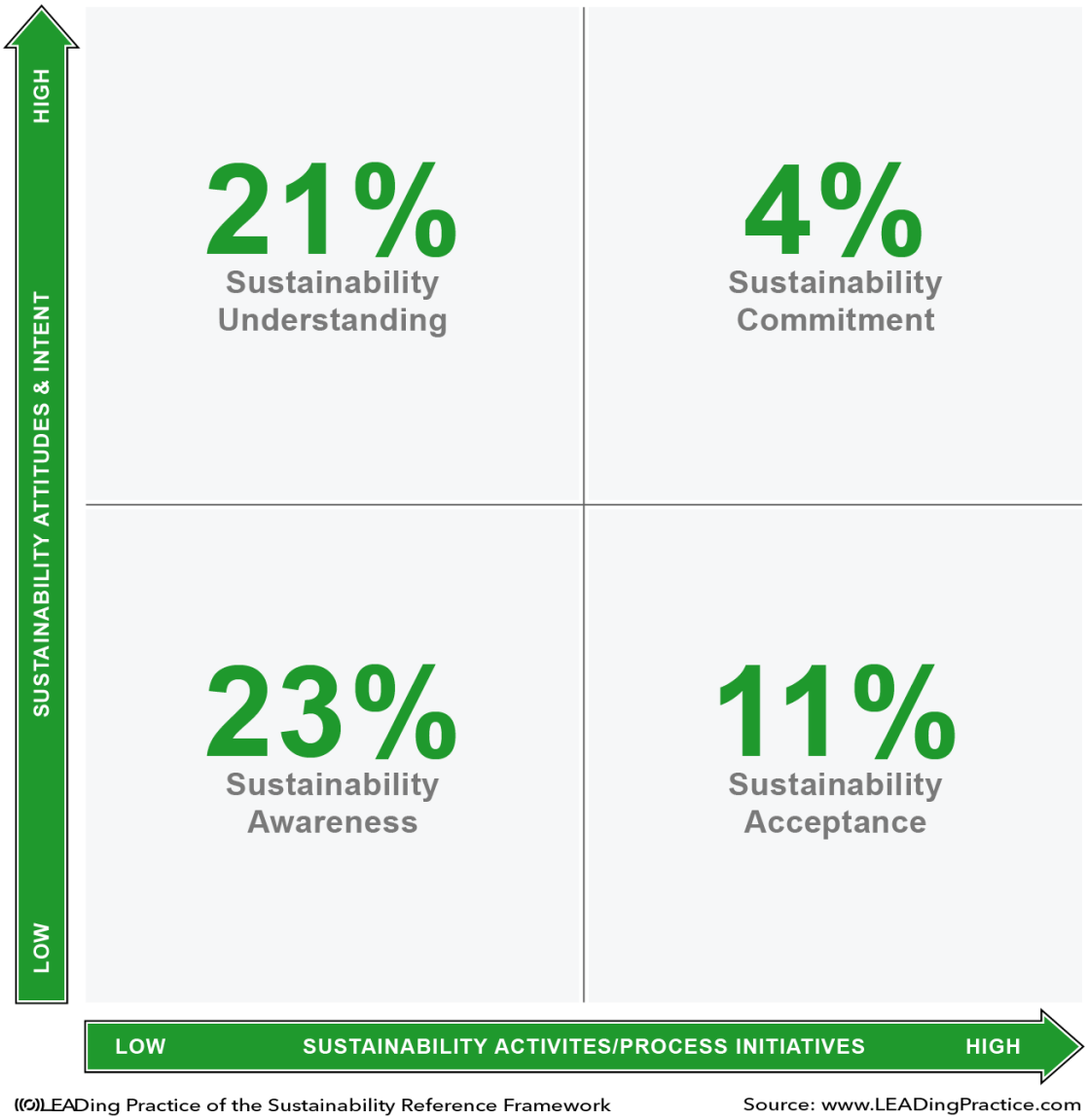
Does your company have all the mentioned points/initiatives above, plus:

- Does your business have a sustainability strategy as part of their business strategy?
- Does your business have aggressive environmental policies and goals?
- Does your business innovate on their sustainability processes?
- Are environmental realities transformed into the way your firm does business?

*If **yes**, your business most likely has Sustainability Commitment.*

If your organization is not in one of the categories, then you are like 41% of other companies who have not yet started.

YOUR Organization, can change something and be part of making the extreme needed difference!



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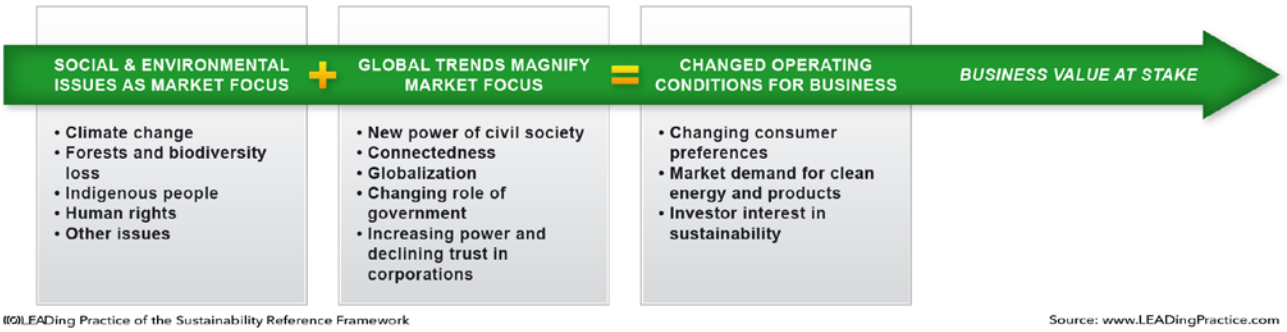
MOVING FROM BEING COMPLIANT TO BEING A LEADER

In considering the top actions for developing a Business Sustainability, one must however consider the business value that is at stake as well, coming from Social and Environmental issues, such as climate change, forest and biodiversity loss, Human rights, scale of population and growing political uncertainty and many other issues. As well magnified global trends, such as new power and civil society, connectedness, globalization, accelerating technological progress, changing role of government, increasing power and declining trust in corporations and many others, they change the operating conditions for the business and thereby threatens the existing business model.



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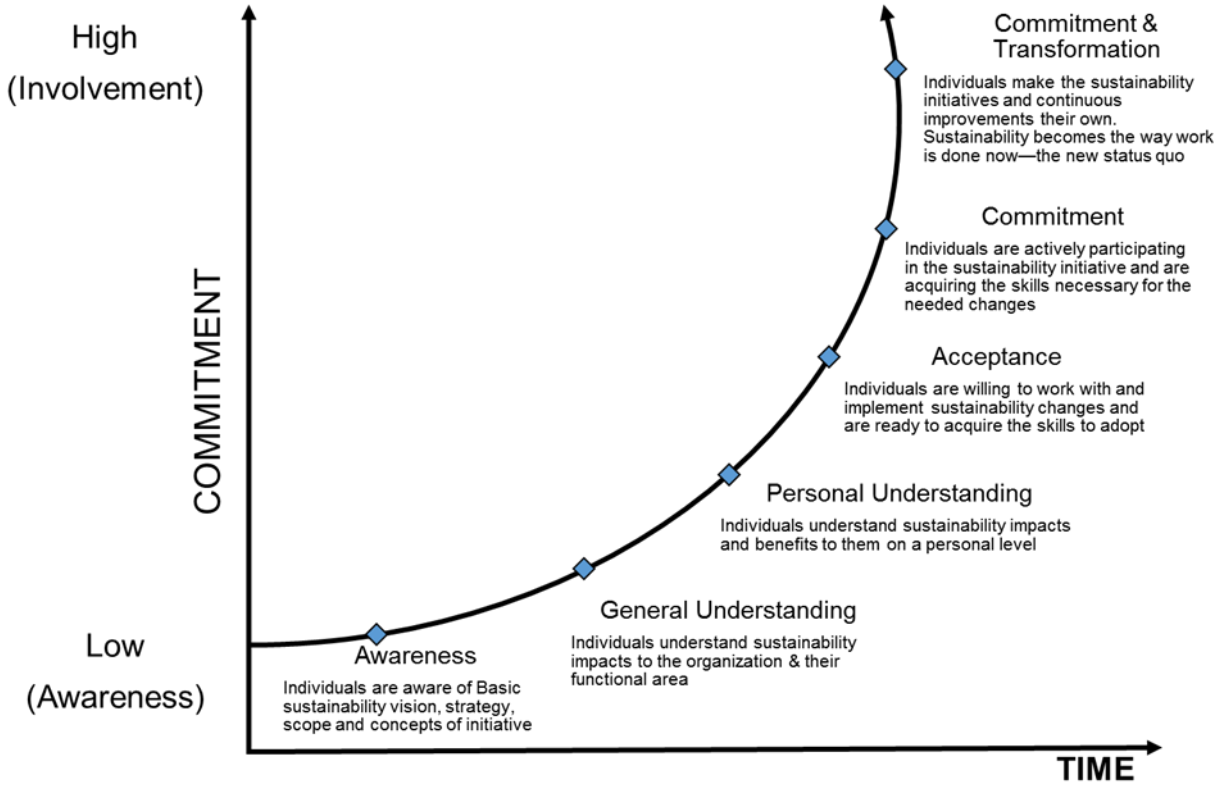
Understanding the changes the operating conditions for the business has and thereby the threats to the existing business model, many companies want to change. However from experience they know that change is hard to deal with. Many employees do not react positive to change and reactions can be from resistance, anger, betrayal, shock and misfortune.

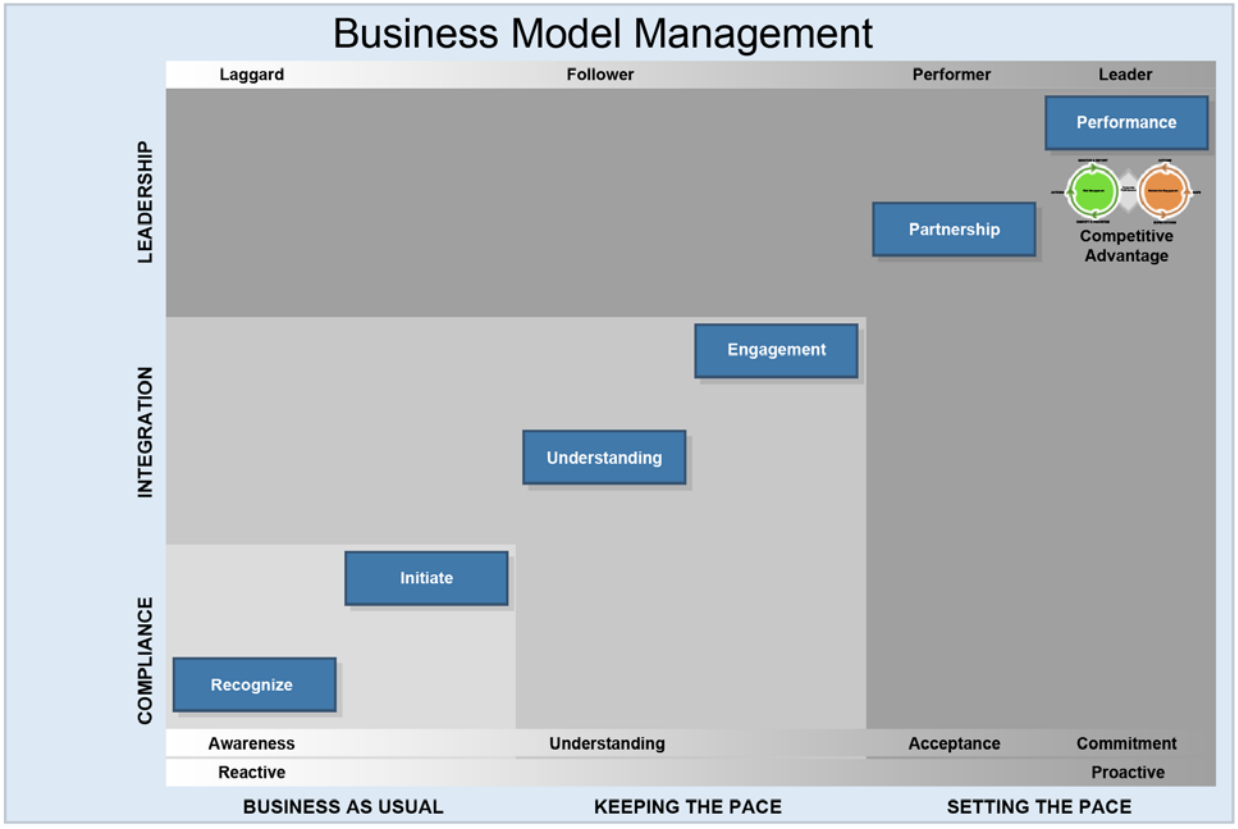
But giving it some time to mature and develop awareness, understanding acceptance and then a personal commitment while the organization implements some of the larger sustainability change isn't necessarily bad.



As in many things the first can be the hardest. In the case of business sustainability, the first step would include that an organization needs to move beyond being compliant to industry and or government rules and regulations and thereby move beyond doing business as usual. The question is how organizations can move beyond a business as usual focused approach and create internal awareness and eventually ownership with a positive impact on their sustainability management and business performance and by building senior management commitment.

The benefits of integration of sustainable initiatives within the organization and getting an engagement throughout the organization, e.g. increased awareness include reduction of waste demonstrated by reductions in raw material, energy and water costs and lowering of compliance costs. Developing an understanding and organizational engagement is therefore essential to keep pace with sustainability leaders. Ensuring understanding and ownership and organizational is on the other side essential in order to leverage the competitive advantage that can be derived from the integration of sustainability management in the business. Turning sustainability to their advantage with efficiency, innovation and enhanced corporate reputation, will help the company reduce the cost of capital, grow revenue and minimizes risk, encourages investors and attracts and retains superior talent.

However in order to set the pace and position themselves as strategic sustainability leaders through an approach which integrates sustainability in all aspects of business. This enables the development of partnerships with key stakeholders and an emphasis on innovation throughout the different business areas, processes and systems. Pace setters gain advantage by accessing new markets, being the employer of choice and establishing their brand and reputation as leaders.



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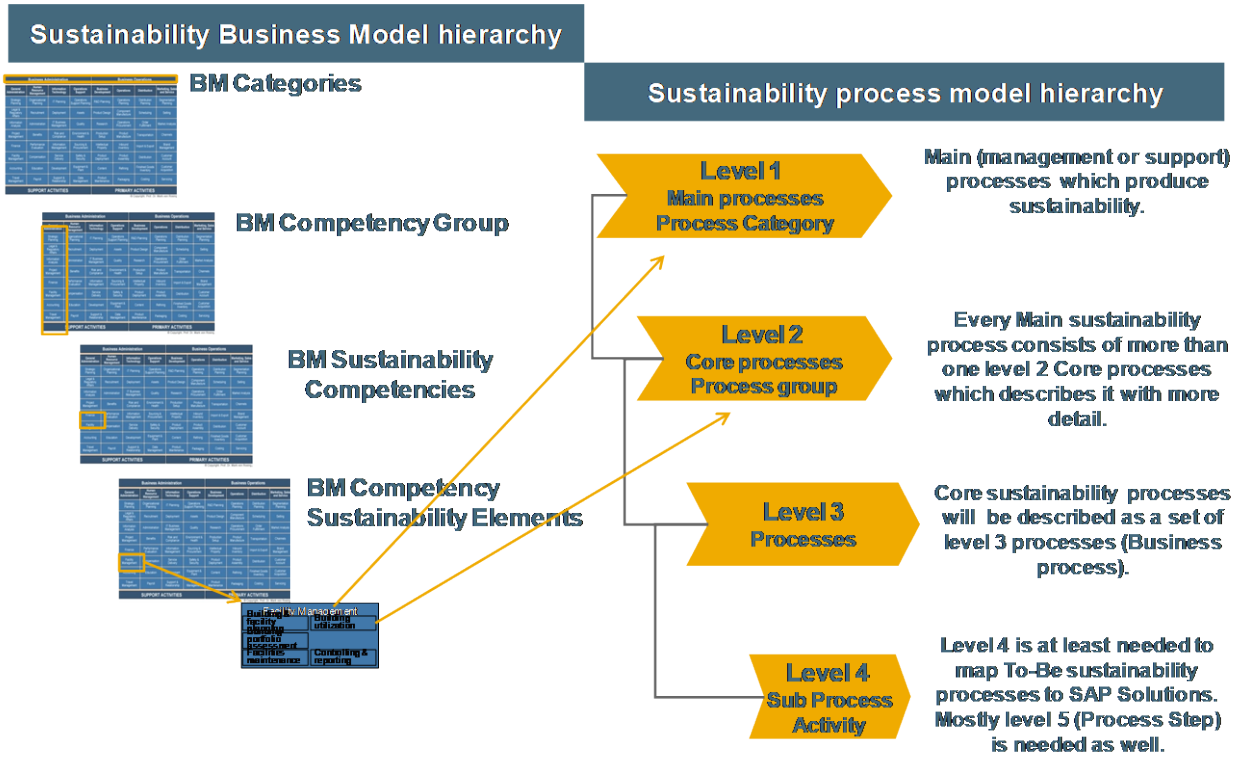
Developing a Sustainability Business Model

Work is represented at different levels within the process map, starting with the Sustainability Business Model and than going all the way down to different sustainability process and activities.



Business Model Sustainability Competency Elements and main processes and core processes can/should be interlinked

Once the company has defined the degree of sustainability business model the wish to have, the sustainability process categories including the strategic sustainability processes, core sustainability processes and support sustainability processes should be defined and outlined. The sustainability business model is the competency group that defines, cascades, and incorporates the company sustainability strategy.

The sustainability elements of the business model competencies acts as an input for both the main sustainability processes and core sustainability processes. *Core sustainability processes* consist of the fundamental activities that create direct sustainability benefit. The sustainability processes in this category should describe the core sustainability competencies and competitive advantage that the company can gain with sustainability. *Support Sustainability processes* does not create sustainability benefit directly.

However, they are not less relevant than core sustainability processes because they describe the sustainability activities required to ensure efficiency of the core.

Main Sustainability Scenarios

Main sustainability scenarios can be considered the top level, or level 1, of a sustainability process map hat should be created. They describe a set of logically related sustainability processes performed to achieve a defined and measurable sustainability outcome for a particular internal or external process. Each sustainability category consists of one or more sustainability process scenarios. An example of a main sustainability process scenario in the category "support sustainability processes" would be "purchase sustainability goods and services."

Core Sustainability Processes

The second level of the sustainability process map, or level 2, includes the core sustainability processes, which are a set of operations that represent the primary sustainability flow or value chain in a company. All core sustainability processes follow a certain flow to accomplish the defined sustainability outcome of a main sustainability process scenario. A possible core sustainability process at this level, under the "purchase sustainability goods and services" process scenario could be "perform strategic sustainability procurement."

Sustainability Processes

Sustainability processes, at level 3 of the sustainability process map, represent the operation of a sustainability process that performs a defined sustainability function. The order of the sustainability processes illustrates the logical sustainability flow followed to fulfil the purpose of the sustainability process. An example would be "execute a sustainability demand and opportunity analysis."

Sustainability Process Activities

Sustainability process activities are at the lowest level of the sustainability process map but can also be broken down into several levels of detail. Sustainability activities can consist of single or multiple tasks, including those performed in an application and represented in a transaction. "Collect sustainability purchase requirements" may be an example in the sub-process "execute a sustainability demand and opportunity analysis."

SUSTAINABILITY IMPLEMENTATION WITH THE SUSTAINABILITY ACCEPTANCE

Building your own Sustainability Maturity Model

The Sustainability Maturity Model (SMM) can be described as a structured collection of elements that describe the aspects of sustainability maturity in an organization. Like any model it should be seen as an abstraction of an existing system.

The Sustainability maturity model may provide, for example:

- an understanding where your organization is in their sustainability maturity.
- Could give some inspiration of how or where to start.
- A view on how sustainability would affect your business and your industry now and in the future.
- The benefit of many other companies and their prior experiences and the sustainability steps/levels they went through.
- A common sustainability language and a shared sustainability vision.
- A sustainability framework for prioritizing actions.
- Defined Critical Success Factors (CSFs) and how you want to measure and manage it.
- A way to define what sustainability processes and activities means for your organization.

The Sustainability Maturity Model can be used as a benchmark for comparison and as an aid to understanding - for example, for comparative assessment of different organizations where there is something in common that can be used as a basis for comparison. In the case of the Sustainability Maturity Model (SMM), for example, the basis for comparison would be the organizations' sustainability development processes. These benefits and drivers can be on core processes such as the core competitive or core differentiated or even be on none core processes. Both core and none core processes can fall into the realm of allocated overhead costs. While raw materials and labor expenses are often linked directly to products or processes, costs for electricity, real estate, HVAC, water, and paper – among other environmental expenses – accumulate in overhead accounts. These values and hidden costs should be identified on a processes level in order to reduce waste and deliver both environmental and financial benefits that might not have been identified and then captured or, if captured as part of another project, might not have been recognized. However many organizations have not yet recognized, initiated or piloted Sustainability strategy and a sustainability employee engagement.

The sustainability maturity listed below that outlines the sustainability adoption and the possible competitive differentiation gives an overview both how a company can start and what they can receive

from that engagement. Often it can be much more about what not to do rather and what you are doing or about outperforming the competition.

The Sustainability Maturity Model has five levels defined along the continuum of the Capability Maturity Model (CMM). CMM was developed and is promoted by the Software Engineering Institute (SEI), a research and development centre sponsored by the U.S. Department of Defence (DoD). SEI was founded in 1984 to address software engineering issues and, in a broad sense, to advance software engineering methodologies (Crosby, 1979). However the five levels of the Sustainability Maturity Model are not the same as in CMM, there are though some basic similarities. The Sustainability Maturity Model however incorporates different business aspects to the five phases.

1. **Recognize** – This level is the starting point for understanding that sustainability is important and recognizing which processes and activities are connected with sustainability. At this level the first green processes would be chaotic and ad hoc. Due to the lack of overall organizational sustainability initiatives it is characteristic of the first green processes at this level that they are (typically) un-documented and in a state of dynamic change, tending to be driven in an ad hoc, uncontrolled and reactive manner by users or events. This provides a chaotic or unstable environment for the green processes, which at this level mostly are compliant to industry and or government rules and regulations.

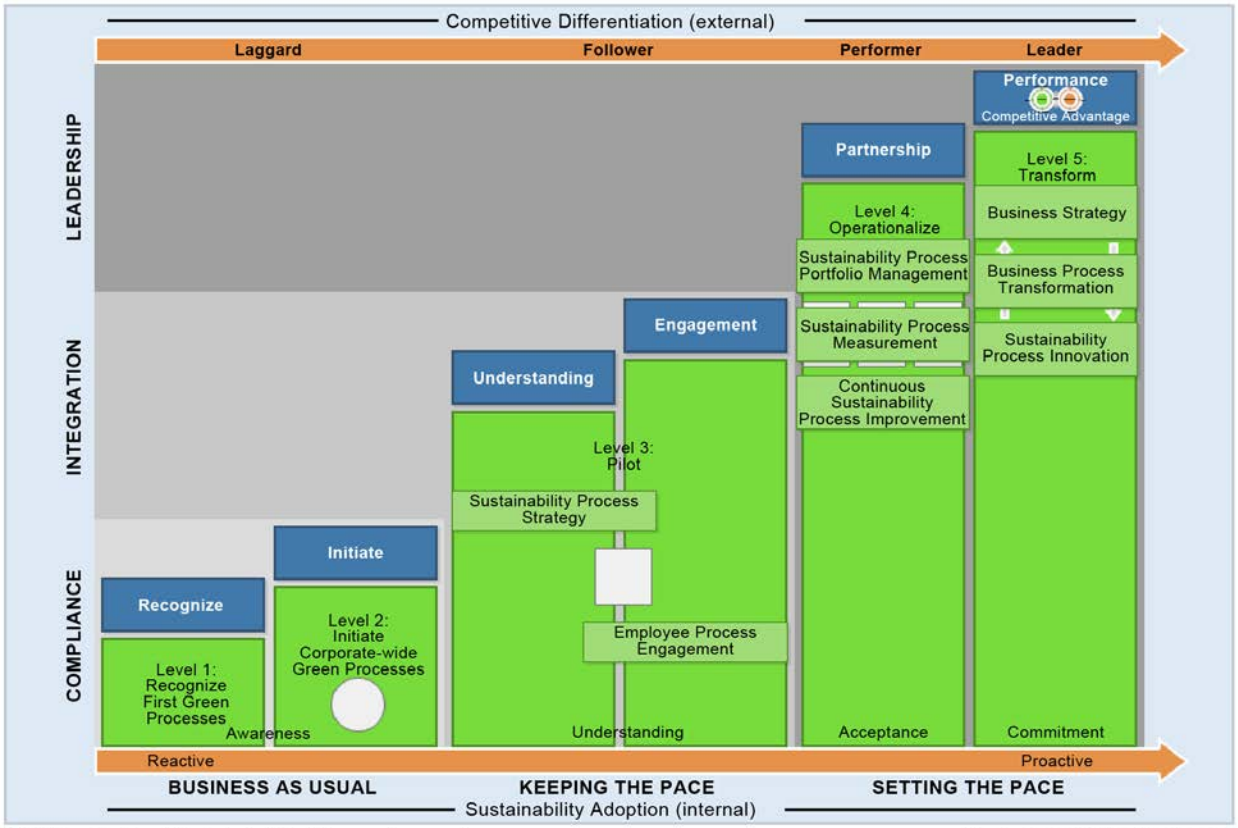
2. **Initiate**- corporate wide green processes and activities are initiated and managed according to the sustainability metrics described. It is characteristic of sustainability processes at this level that some processes are repeatable, possibly with consistent results. Green discipline is unlikely to be rigorous, but where it exists it may help to ensure that existing processes are maintained during times of stress. At this level most green initiatives are still developed to be compliant to industry and or government rules and regulations.

3. **Pilot** – organization defines the entire sustainability strategy and then pilots' standard business process, e.g. employee engagement process. It is characteristic of green processes at this level that there are sets of defined and documented standard green processes established and subject to some degree of improvement over time. These standard processes are in place (i.e., they are the AS-IS green processes) and used to establish consistency of green performance across the organization. At this level, these green processes are going beyond, being compliant to industry and or government rules and regulations, as the organization has matured from being aware of sustainability to understand and having an engagement to the competitive importance of sustainability.

4. **Operational** – having a corporate-wide sustainable portfolio management, managers can at this level identify ways to operationalize and thereby adjust and adapt the green to particular department, projects or services without measurable losses of quality or deviations from the sustainability strategy and specifications. It is characteristic of green processes at this level that, using sustainability measurements and continuous sustainability improvements, management can effectively control the AS-IS green sustainability initiatives. Sustainability Capabilities is established from this level.

5. **Transform** - It is a characteristic of sustainability processes at this level that the focus is on continually improving sustainability innovation through both incremental and innovative business transformation that is fully interlinked with the overall business strategy.

Transformation includes therefore deliberate sustainability innovation and thereby optimization and improvement.



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Even though many organizations want to:

- Be compliant to the sustainability regulations – to be able to keep on doing business as usual.
- Integrate sustainability initiatives to keep the pace of the market.
- Obtain cost savings with sustainability.
- Be leading in the sustainability area in order to set the pace.

Do many organizations not know how go about it, they face different kinds of priority-setting issues to gain a sustainable competitive advantage in once industry, market or niche:

- Which sustainability industry specific business model strategy fits to my organization, technology and processes in order to create the wanted business value.
- How should we developing the sustainability governance model to match the sustainability business model vision/strategy and financial objectives.
- Identifying the different sustainability owners to create the wanted sustainable business value and performance framework.

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Source: www.LEADingPractice.com

Because Business Sustainability is a significant cultural change for a company, a successful approach requires more than just a proven project methodology. A number of elements need to be considered, concentrating on the four pillars:

1. **Strategic alignment** - The sustainability maturity of a company largely depends on the sustainability strategy. But to truly have an integrated sustainability strategy, rather than "one-off" opportunities, a business will need have a strategy that holistically incorporates organization, technology and processes in order to create the wanted results.

2. **Organizational alignment** - Every enterprise implementing sustainability processes already has an existing organizational structure. Optimizing or introducing new processes often leads to a change in those structures. The right people with the right skills and accountability priority is needed within the business units and IT.

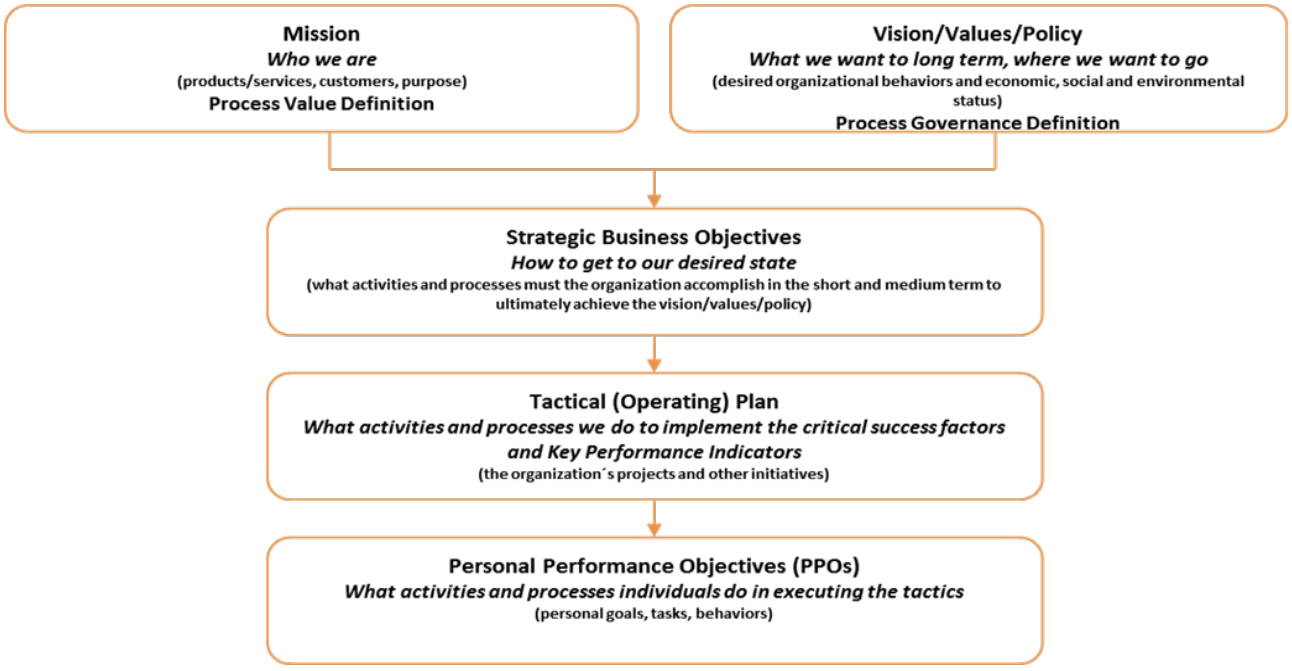
3. **Technology alignment** - The efficient execution of sustainability processes in today's corporate world is largely dependent on IT systems supporting administration, production and operating model and others. Additionally, an effective and efficient approach should use an optimal mix of technology to support each phase.

4. **Processes alignment** - Business processes form the core differentiation for organizations, because the focus is on the company's processes. However, the process of Business Processes Management (BPM) itself is very important and key to ensuring a successful sustainability implementation that continues to be lived in the organization.

The mentioned alignment always relies on effective and efficient integration of organization, technology and processes, but many organizations do not have a clear link between the four key pillars. An organization's strategy may be gaining a competitive advantage, innovation, growth, acquisitions, differentiation, increasing profitability, or gaining market share, meanwhile all of these strategies require suitable business processes that are embedded in adequate organizational structures and aligned with the processes and supported by people and technology.

Developing a Sustainability Value Model

Once the approach/path is chosen the foundation, the company can start building the sustainability mission, vision, strategic business objectives, tactical and operation plan. However developing the sustainability competencies, processes and activities that rivals will be hard-pressed to match, have to be innovated and transformed into the everyday processes of the company, from the mission, vision, strategic business objectives, tactical and operation plan.



To obtain a transparent view of the business processes and thereby the sustainability value definition, and sustainability governance definition across the company and different business units, a process map needs to be defined. A process map is a representation of the overall work that is done within a company, and it aligns the processes with the sustainability strategy.

Sustainability Strategy Map

In order to that helps an organization to move beyond what is "required to do business" or being a laggard or follower in the sustainability field and to move toward being a performer and or leader in sustainability to gain the differentiation and competitive advantage a company is looking for, it would be very beneficial to build a *sustainability strategy map*.

Building such a sustainability strategy map a company could identify the "key sustainability drivers" of innovation that also yields real rewards rather than extra cost. By understanding which sustainability initiatives it takes to design, innovate and transform once business model to match the sustainability vision and strategy that is needed to not only gain cost improvement but strategic advantage as well.

To gain a strategic advantage, one or more competitive sustainability strategies should be chosen. Becoming leading-edge in sustainability therefore is about taking offensive or defensive action to create a leading-edge position in an industry or the market, in order to cope successfully with the competitive forces and sustainability choices the peers have chosen and thereby generate a superior return on investment.

When the principles of competitive advantage strategies, from Porter[18] are applied to sustainability, there are 2 basics types of competitive advantage:

- Cost leadership (low cost), and
- differentiation.

Both can be more broadly approached or narrow, which results in the third viable competitive strategy:

- Focus.

A competitive advantage in sustainability exists when the firm is able to deliver the same benefits as competitors but at a lower cost (cost advantage), or deliver sustainability benefits that exceed those of competing products (sustainability differentiation advantage). Thus, a competitive advantage enables the firm to create superior sustainability value for its customers and superior profits for itself. Cost and differentiation advantages are known as positional advantages since they describe the firm's position in the industry as a leader in either cost or differentiation. However contrarily to the rationalisation of Porter[19], contemporary research[20] has shown evidence of firms practicing successfully a mixture of low cost and differentiation strategy.

18 Porter, Michael E.: Competitive Advantage. Creating and Sustaining Superior Performance. The Free Press. 1998
19 Porter, Michael E.: Competitive Advantage. Creating and Sustaining Superior Performance. The Free Press. 1998
20 - Kim, Chan, "Value Innovation - The Strategic Logic of High Growth". Harvard Business Review 75, January-February, 103-112. 1997.
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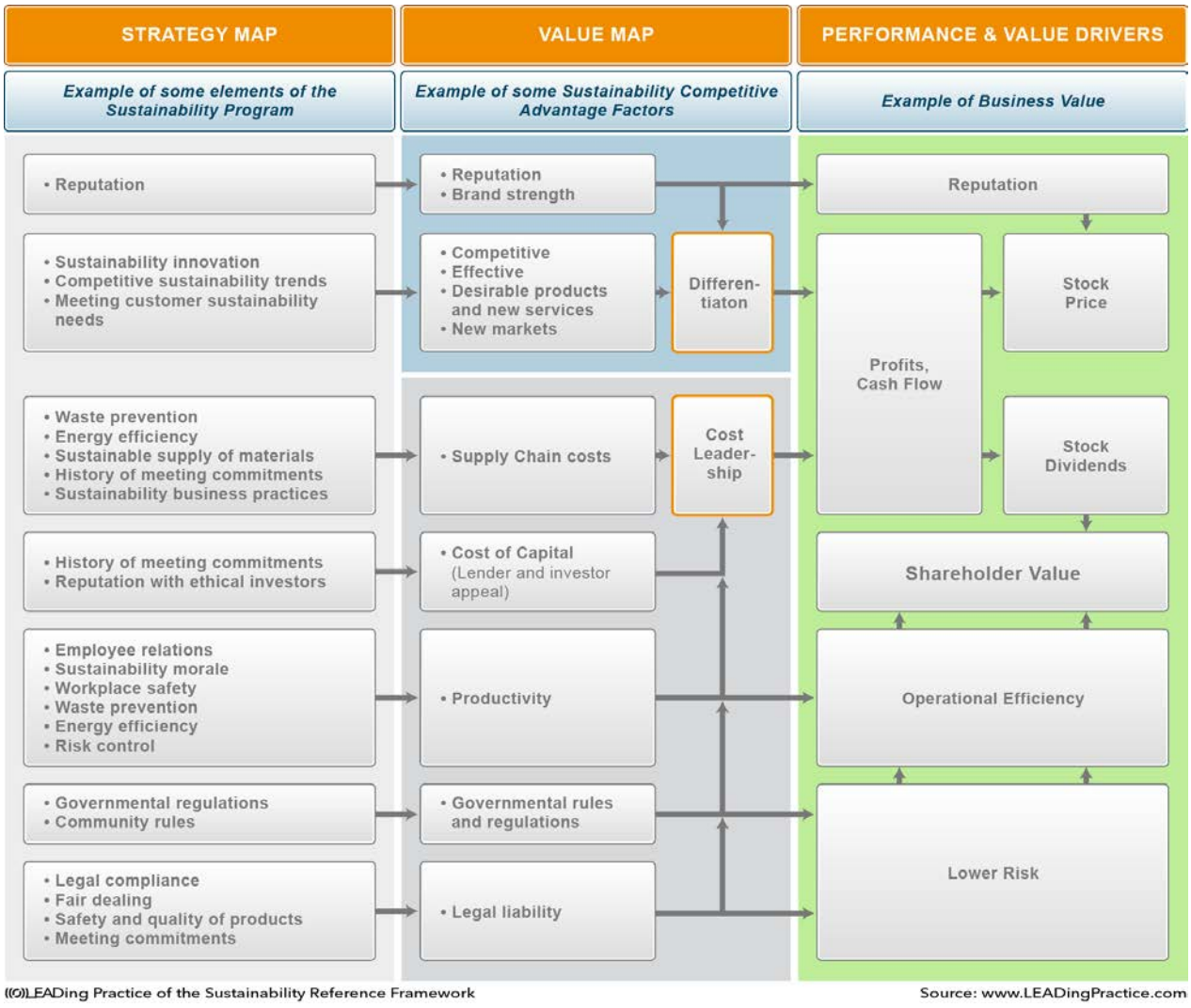
- Kim, Chan, "Tipping Point Leadership." Harvard Business Review 81, April, 60-69. 2003.
- Kim, Chan, "Blue Ocean Strategy." Harvard Business Review, October, 76-85. 2004.

Research writings by Prajogo[21] state that firms employing the hybrid business strategy (Low cost and differentiation strategy) outperform the ones adopting one generic strategy. Sharing the same view point, Hill[22] argued that successful combination of those two strategies will result in long term competitive advantage. Combining these strategies is successful, when for example combining a market segmentation strategy with a product differentiation strategy is an effective way of matching your firm's product strategy (supply side) to the characteristics of your target market segments (demand side).

But combinations like cost leadership with differentiation are hard (but not impossible) to implement due to the potential for conflict between cost minimization and the additional cost of value-added differentiation. To achieve a competitive advantage, the firm must perform one or more value creating activities in a way that creates more overall value than do competitors. Superior value is created through lower costs or superior benefits to the consumer (differentiation). In that case a company would have to define on a high level, how competitive advantage is created by using lower cost structure and which by applying differentiated leadership and what business value which strategy can or will generate.



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Source: www.LEADingPractice.com

21 Daniel I. Prajogo, Mark Goh: Operations Management activities and operational performance in service firms. IJSTM 8 (6): 478-490 (2007)
22 Charles W. L. Hill and Scott A. Snell, External Control, Corporate Strategy, and Firm Performance in Research- Intensive Industries, Strategic Management Journal, Vol. 9, No. 6 (Nov. - Dec., 1988), pp. 577-590, Published by: John Wiley & Sons

After the generic strategies of Cost and Differentiation Leadership are chosen, many writers[23] argue that specific and multiple business strategies need to be specified and applied in order to carry out the chosen strategies. According to the resource-based view[24], in order to develop different underlying competitive advantage strategies the firm must apply the strategies to the resources and capabilities and thereby the competencies of the company. Without applying this to the company competencies, the competitors simply could replicate what the firm was doing in sustainability and any advantage quickly could disappear.

Resources are the firm-specific assets useful for creating a cost or differentiation advantage and that few competitors can acquire easily. Resources are inputs into a firm's process, such as capital, equipment, and the skills of individual employees, patents, finance, and talented managers. Resources are either tangible or intangible in nature. With increasing effectiveness, the set of resources available to the firm tends to become larger.5 Individual resources may not yield to a competitive advantage. It is through the synergistic combination and integration of sets of resources that competitive advantages are formed.

The following are some sustainability examples of such resources:

- Sustainability Patents and trademarks
- Proprietary sustainability know-how
- Employee sustainability relations and commitment
- Employee sustainability morale
- Installed sustainability customer base
- Sustainability reputation of the firm
- Sustainability brand equity

Capabilities refer to the firm's ability to utilize its resources efficiently. A capability is the capacity for a set of resources to interactively perform a stretch task or an activity. Through continued use, capabilities become stronger and more difficult for competitors to understand and imitate. As a source of competitive advantage, a capability "should be neither so simple that it is highly imitable, nor so

23 - Robert M. Dibrell, C. Clay, CONCEPTUAL AND EMPIRICAL EVIDENCE OF INTERNATIONAL MACRO AND MICRO CONGRUENT, Advances in Competitiveness Research Peterson, 1999

- Kim, Eonsoo Nam, Dae-il Stimpert, J.L., Testing the applicability of Porter's generic strategies in the digital age: Journal of Business Strategies, March 22, 2004
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24 Wernerfelt, B. (1984), The Resource-Based View of the Firm. Strategic Management Journal; 5, (2), pp. 171–180

- Crook, T.R.; Ketchen, D.K.; Combs, J.G.; Todd, S.Y. (2008). Strategic Resources and Performance: A meta-analysis. Strategic Management Journal; Vol. 29, No. 11, pp. 1141-1154.
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complex that it defies internal steering and control." A capability is the capacity for a set of resources to interactively perform a stretch task or an activity. Through continued use, capabilities become stronger and more difficult for competitors to understand and imitate.

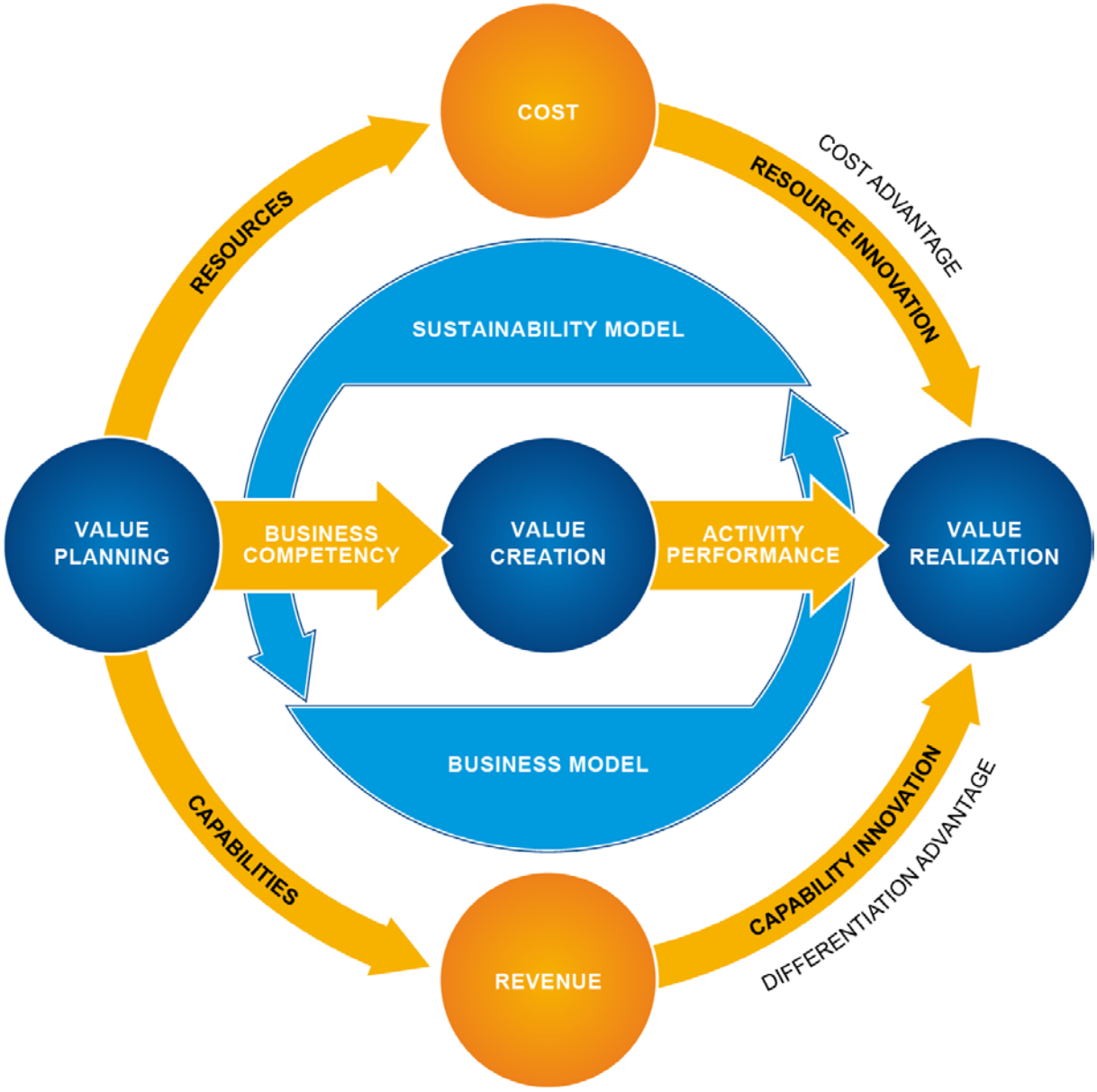
As a source of competitive advantage, a capability "should be neither so simple that it is highly imitable, nor so complex that it defies internal steering and control." [25] An example of a capability is the ability to bring a sustainability product to market faster than competitors. Such capabilities are embedded in the competencies of the organization and should be documented and thus are difficult for competitors to replicate. The firm's resources and capabilities together form its distinctive sustainability competencies.

The competencies are mapped on the business model level. An example of such competencies is the ability to analyze, define, innovate or develop ones competencies (resources and capabilities) actively:

- Analyze “As-Is” and “To-Be” sustainability competencies
- Define sustainability value drivers
- Implement sustainability measurement
- Define continuous Improvement of sustainability processes
- Develop sustainability performance metrics
- Innovate sustainability processes
- Sustainability governance model

The active planning, creation and realization of such sustainability competencies, strengthens brand, reputation, enable innovation, meeting customer sustainability needs, build employee relations, productivity, efficiency, quality, and, all of which can be leveraged to create a cost advantage or a differentiation advantage.

25 Schoemaker, P.J.H.and Amit,R., Investment in Strategic Assets: Industry and Firm-Level Perspectives,Strategic Management Press, 1994



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Each organization is a collection of unique resources and capabilities that provides the basis for its strategy and the primary source of its returns. In the 21st-century hyper-competitive landscape, a firm is a collection of evolving capabilities that is managed dynamically in pursuit of above-average returns[26]. Thus, differences in firm's performances across time are driven primarily by their unique resources and capabilities rather than by an industry's structural characteristics. The business strategy chosen should allow the firm to best exploit its core competencies relative to opportunities in the external environment[27].

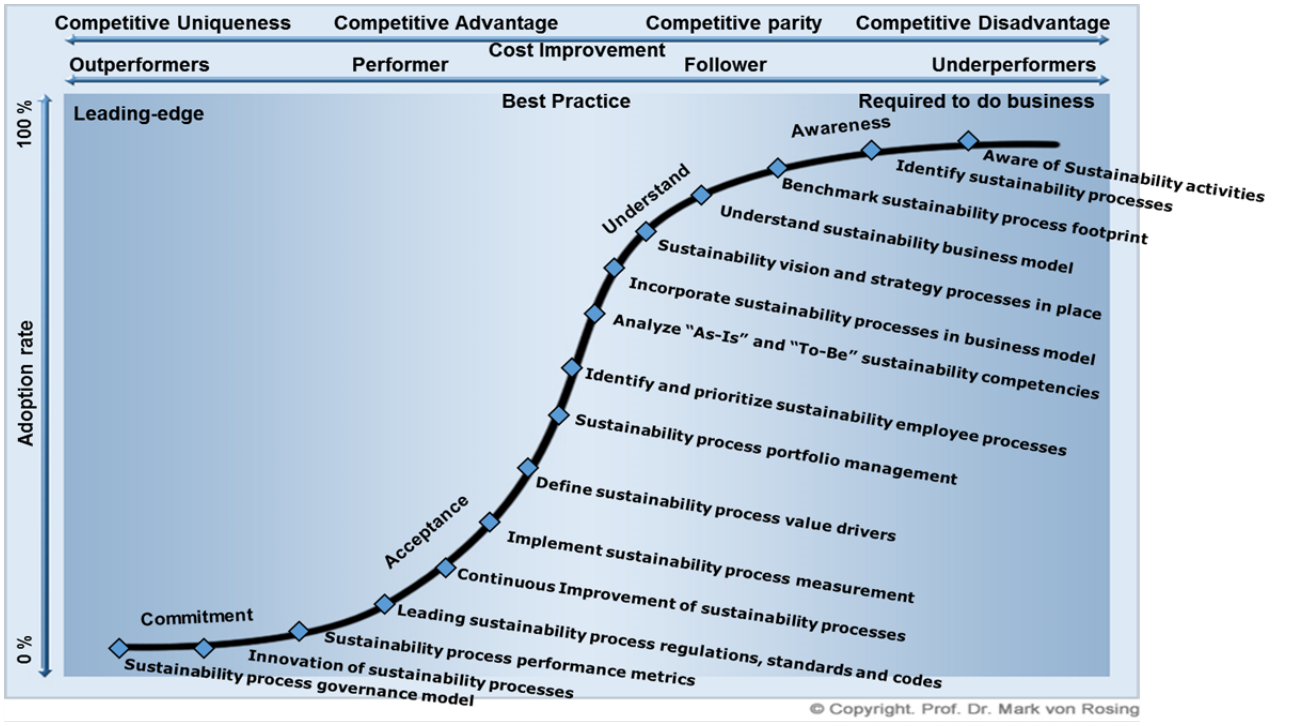
In theory, this might sound easy, however in practice this is quite challenging and many companies would have a hard to determine exactly what their competitive advantage is. The best way to determine ones competitive advantage is as described in chapter 5.2, which is to break down the competencies from the very business model to the processes and activities.

26 Regner, P., Strategy-as-practice and dynamic capabilities: Steps towards a dynamic view of strategy, Mendeley, 2008
27 Hint, M.A. Ireland, R.D. Hoskisson, R.E, Strategic Management - Competitiveness and Globalization, South-Western College Pub, 2004

Once these are described and detailed one should map the competencies into four distinct categories:

- **Competitive uniqueness:** What can my company do for my customers that no one else can do? What can my company offer that no one else can offer?
- **Competitive advantages:** What can my company do for my customer that my competitor can also do, but my company can do it better and we can prove it?
- **Competitive parities:** Objectively speaking, our competitors and my company are the same here - no real differentiation.
- **Competitive disadvantages:** Where does the competition have an advantage over my company?

It is therefore vital that competitive advantage is created by analyzing, defining, innovating or developing ones competencies actively, to achieve for example either a lower cost structure or a differentiated sustainability leadership. Therefore it can be argued that a firm positions itself in its industry through first understanding what the competition is doing and secondly by its choice of low cost or differentiation strategies that are applied to the competencies of the firm.



Sustainability Value Drivers

Value Management is probably one of the most common dilemmas and challenges confronted by companies today, regardless of factors such as size, revenue, industry, region or business model. The decision to make large-scale investments in Sustainability and IT-enabled sustainability enabled processes as well as the complex challenges in ensuring that these investments are effective end efficiently transformed into the different competencies to realize concrete business value need to be managed. In far too many cases, this business value simply is not realized. Just consider the many different cases and evidence.

In recent years, survey after survey has revealed that from 30 to 70 percent of large-scale investments in for example IT-enabled change is wasted, challenged or fails to bring a return to the company. In fact, one survey on measuring costs and value found that, in many enterprises, less than 8 percent of the IT budget is actually spent on initiatives that bring value for the company[28]. Another survey of 124 financial executives revealed that almost 80 percent did not actively encourage value creation in their enterprise[29].

A 2009 IBM survey of Fortune 1000 CIOs found that, on average, CIOs believe that 40 percent of all IT spending brought no return to their organizations[30]. A 2007 study conducted by The Standish Group found that only 35 percent of all IT projects succeeded while the remainder (65 percent) were either challenged or failed[31].

However, this is not an issue only specific to IT investments, for very few companies actively manage for value. Research carried out by the Cranfield School of Management suggests that less than 30 percent of the largest companies actually have a formal value management process. [32] They don't have a formal value planning, value creation and value realization formulation, identification, monitoring or measurement in place. Many organizations ask themselves what it takes to 'get value right'? One of the single most important factors is a clear understanding of the drivers, business factors and the breakdown of the economic business value the investment can and should deliver[33].

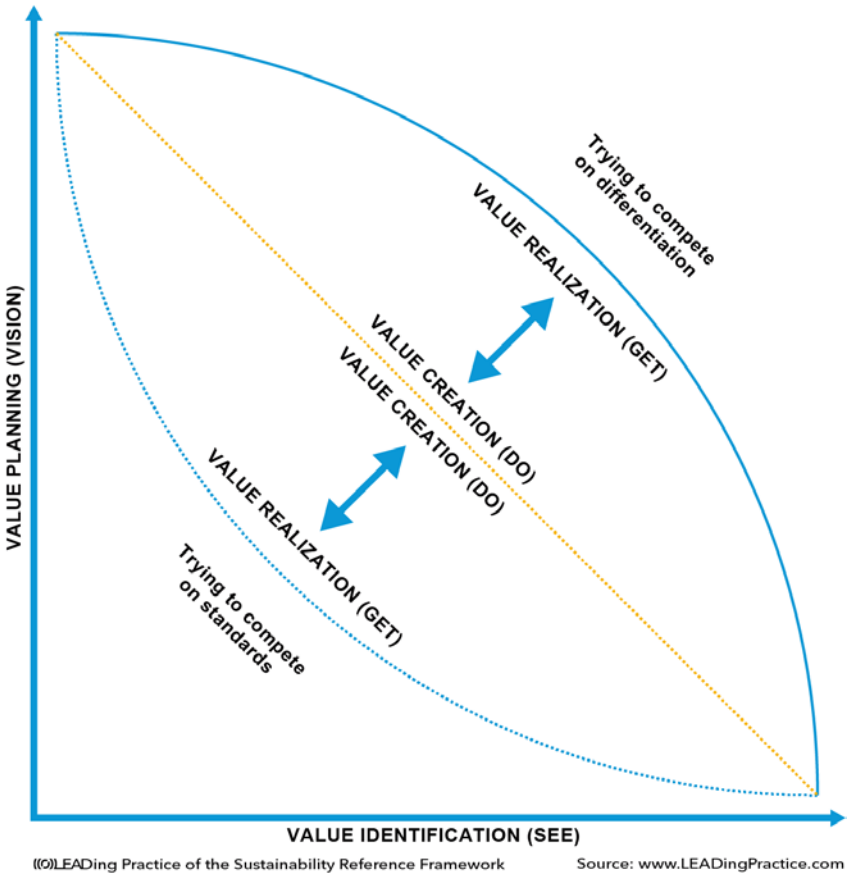
Introducing or improving a real value management practices in an organization is not an easy task, and will take time. It may require significant change in terms of executive thinking and action around decision making, value and accountability. Organizations should formalize the breakdown[34] of the strategic business objectives (SBOs), to the critical success factors (CSFs) with the associated Key Performance Indicators (KPIs) and the attached Process Performance Indicators (PPIs) in order to get the right, identification, and monitoring or measurement process in place.

28 Butler Group, 'Measuring IT Costs and Value', September 2005
29 Deloitte, 'Driving Enterprise Value,' October 2004
30 IBM Global CIO study, IBM, 2009
31 Cook, R.; 'How to Spot a Failing IT Project', CIO Magazine, 17 July 2007
32 Peppard, J.; J. Ward; Unlocking Sustained Business Value From IT Investments, Cranfield School of Management, UK, 2003
33 von Rosing, Mark,. Business Value Management, a way to plan, create and realize value – (2009)
34 von Rosing, Mark,. Building the right Business Performance Management Framework – (2009)

Level	Focus Area	Measurement
Strategic	SBO (Strategic Business Objective)	BPI (Business Performance Indicator)
Tactical	CSF (Critical Success Factor)	
Operational		KPI (Key Performance Indicator)
		PPI (Process Performance Indicator)
	Value Management	Performance Management

((o))LEADing Practice of the Value Reference Framework Source: www.LEADingPractice.com

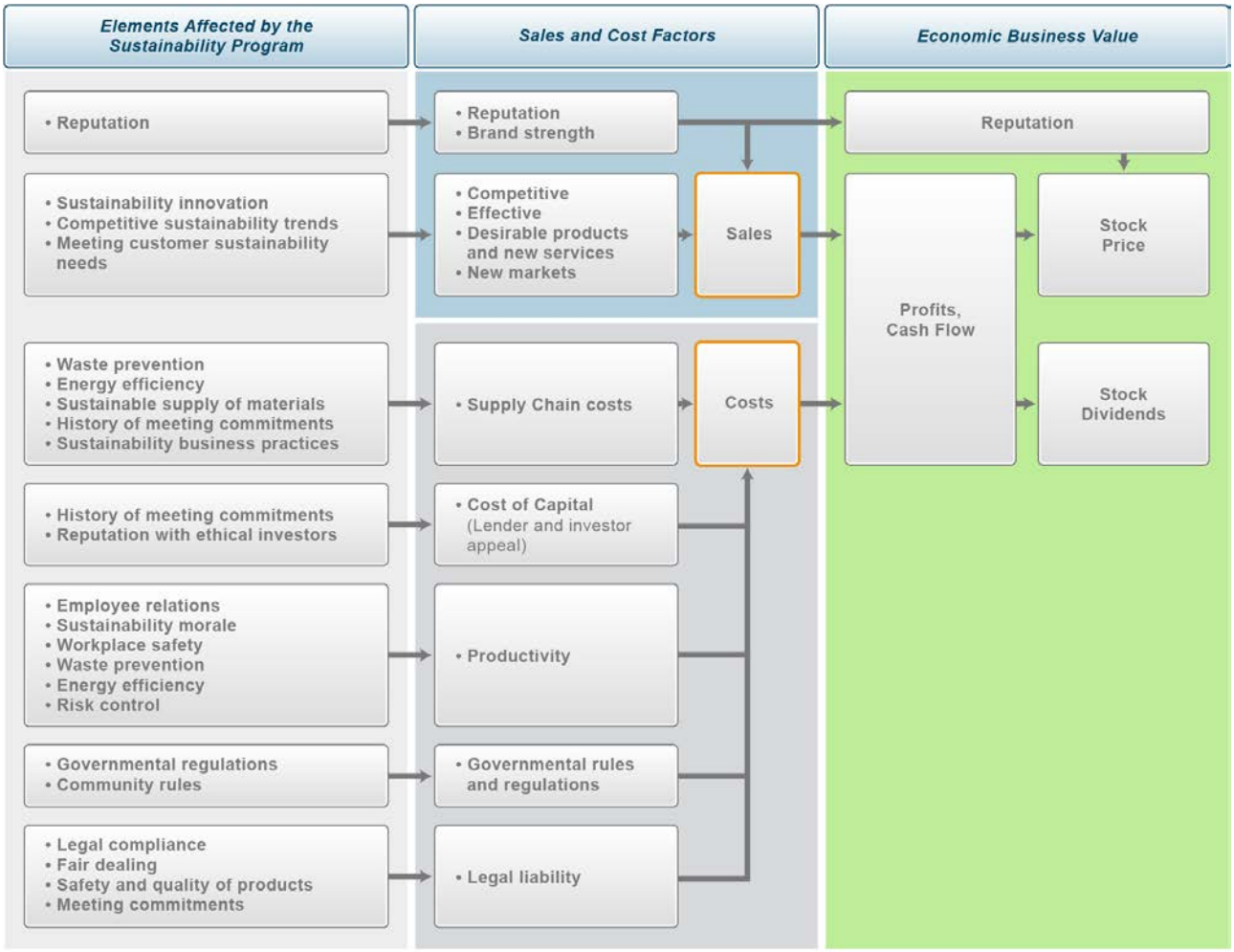
This will enable the organization to plan the value they want to create and then realize within the context of the vision and the overall strategies. Interesting enough is the fact that companies spend the most time trying to realize value. This in itself is quite understandable; however the fatal mistake they are doing is that the most organizations do not realize the simplistic fact that there is a direct connection between value planning, value creation and value realization[35].



((o))LEADing Practice of the Sustainability Reference Framework Source: www.LEADingPractice.com

[35] von Rosing, Mark,. Business Value Management, a way to plan, create and realize value – (2009)

In terms of business value and sustainability, companies must understand the value of their investment in Sustainability in order to stay competitive in today's rapidly changing business world. The Sustainability gains, sustainability costs, revenue potential and possible value spots are often hidden and, therefore, not always addressed.



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In order to not only plan, create and realize these values the company must utilize the competencies (e.g. resources and capabilities) in some kind of Sustainability Value Management and Performance Management framework that ensures that the organizational goals are delivered to the desired sustainability value and goals, should be implemented. It establishes a shared understanding about which sustainability values should be achieved, and an approach to lead and develop responsible sustainability owners to ensure it is achieved. Such a Sustainability Value Management and Performance Management strategy relates to every activity of the organization in the context of its sustainability resources and capabilities.

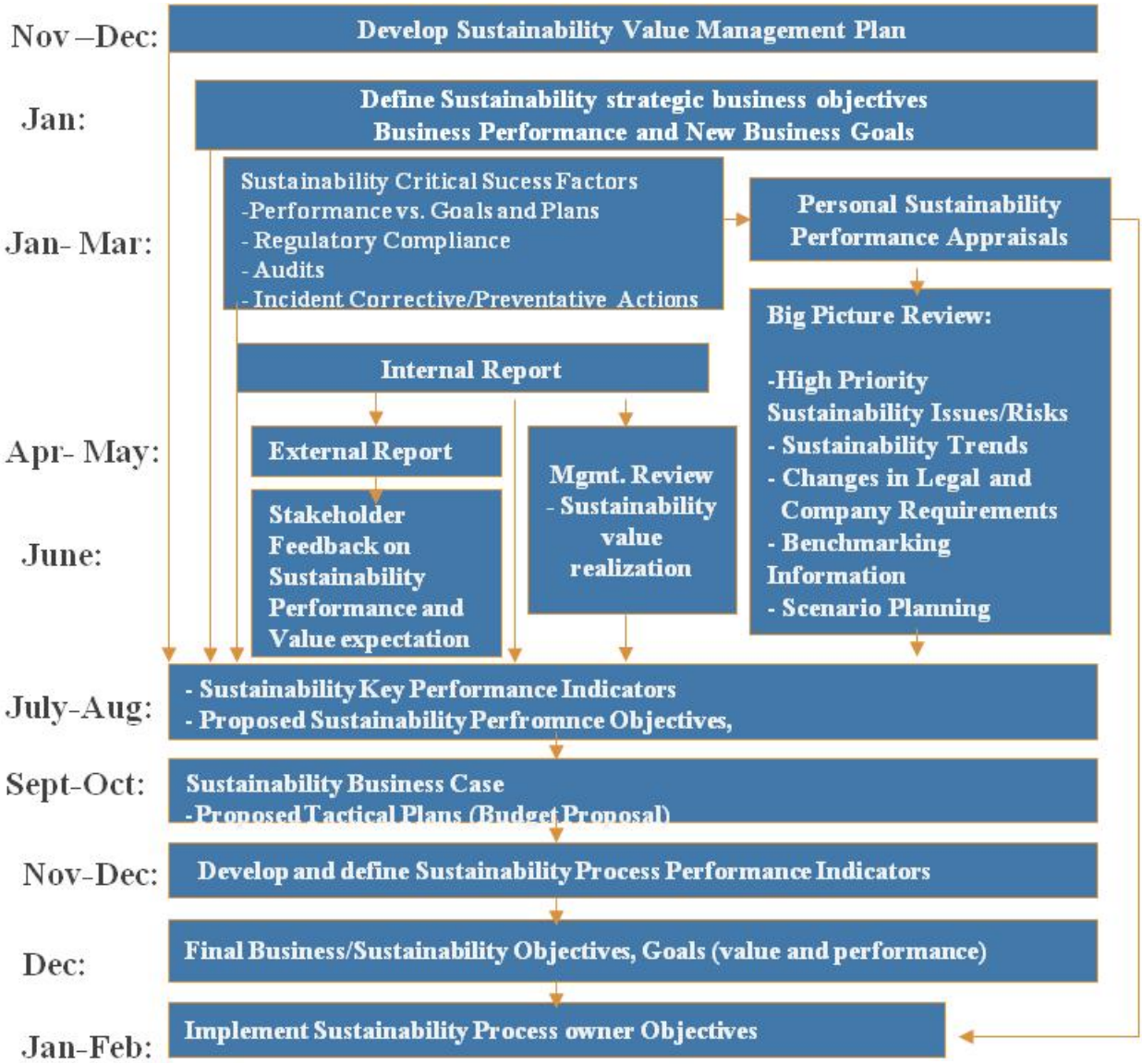
The reason why sustainability goals and other indicators fail to deliver the value and performance are among some of these:

1. The sustainability value definitions and performance measures are not credible with intended data users because:
   a. The measures are based on unreliable, sparse, or old data.

   b. The measures are being collected, complied, and/or reported by people who are not trained or held accountable for doing so.
   c. The meaning of the measures is not clear.
   d. The measures are not thought to be valuable or a priority by those must perform to produce the desired results, or are not linked to
   e. important objectives of those people.
   f. The people whose performance is needed for results are not aware of the measured results.
   g. There are confounding factors other than those intended to be stimulated or controlled that affect the results; the cause relationship is unclear;
   h. the actions needed to improve performance under the measure are not clear.
2. The use of measures is not readily visible; management is not interested in the results.
3. There are too many measures or they are reported too frequently, which overwhelms data compilers and users.
4. Results are reported too infrequently to keep the organization on course.
5. There are too few measures and their context relative to other factors is not well understood e.g., having sales figures without profit figures.
6. Not enough time is allowed for corrective actions to take effect; goals are too short term.
7. There is no accountability or recognition for performance under the measure.
8. Goal targets are unrealistic.
9. The goals drive the wrong performance.
10. The results are not reported clearly or with sufficient detail and explanation.
11. The results are not used to make business decisions.

Such a Sustainability Value Management and Performance Management framework should include:

- **Strategic:** it is about broader issues and longer-term goals and values.
- **Integrated:** it should link various aspects of the organization, technology and processes.
- **Performance improvement:** throughout the organization, from strategic business objectives, critical success factors, key performance indicators to process performance indicators.
- Sustainability owners that are responsible for continuous development of the sustainability initiatives.
- Follow up program.



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Such a sustainability value and performance management framework is a key to understand the bigger picture and have the skills and ability to deliver these expectations, receive pectations have the opportunity to discuss and contribute to individual, team and service objectives.

In order to create and realize these values the company must utilize the competencies (e.g. resources and capabilities). The following is a sample list of roles and their sustainability responsibilities:

- Sustainability owner
  - Manage a sustainability end-to-end
  - Ensure sustainability performance measurement
  - Deliver on sustainability performance target
  - Develop employees who run the sustainability initiatives
  - Avoid silo-thinking and continuously reinforce sustainability process-thinking
- Sustainability eXpert/Architect
  - Facilitate sustainability analysis and design workshops
  - Sustainability Model and publish sustainability processes

  - Develop and continuously enhance sustainability modelling and publishing standards
- Sustainability performance manager
  - Establish sustainability performance measurement systems
  - Measure and analyze sustainability performance on a regular basis
  - Report sustainability performance and analysis results to the sustainability owner
- Sustainability Initiative executor
  - Execute the sustainability initiative according to the current sustainability business model and the sustainability model and agreed sustainability performance targets
  - Report sustainability improvement potentials to the sustainability owner(s)
  - Support sustainability improvement projects

Although an overall sustainability decision-making body — or sustainability steering committee — can be implemented, it may make more sense to define different sustainability bodies for the various stakeholder groups involved in sustainability.

Examples for sustainability decision-making bodies include the following:

1. Sustainability steering committee
   a. Concerned with ensuring that sustainability initiatives support the company's longer-term strategies.
   b. Reviews and approves the sustainability project portfolio, based on strategic importance, funding and resources available.
2. Sustainability standards committee
   a. Discusses and reviews BPM sustainability standards and guidelines for methods and tools.
   b. Acts as a best practice forum for sharing sustainability experiences.

The ten major business sustainability drivers for these sustainability responsible:

- **Operational efficiency:** eco-efficiencies in manufacturing leads to immediate cost savings in form of lower input costs and also lowers company's dependence on natural resources whilst improving quality and building capacity.
- **Risk management:** integrating environmental and social considerations into the decision making framework assists a company to manage its financial, market, operational and strategic risks.
- **Market positioning:** incorporating sustainability considerations into it strategy and operations allows a company to position itself as a market leader and maintain a competitive edge and strengthen brand value.
- **Innovation and learning:** innovation around sustainable products and efficient processes will enable companies to build capacity to cater for and exploit future trends and improve customer relations by offering superior product quality.
- **Human capital development:** employee welfare and development programs along with a supportive work culture can reduce turnover and training costs and increase productivity. Such initiatives also help boost employee morale and strengthen organisational commitment creating the employer of choice.
- **Community acceptance/licence to operate:** partnering and maintaining a continuous dialogue with stakeholders ensures that the company maintains its license to operate and enables potential liability issues to be addressed early thus reducing potential legal costs. Partnering

with the community also helps companies identify new market trends and gain access to sensitive markets.

- **Corporate governance:** effective corporate governance ensures that the company builds trust with a wide range of stakeholders and has the capacity to respond to future regulations. Improved reputation plays a part in reducing the cost of capital.
- **Supply chain management:** collaborating with suppliers of both goods and services to address various environmental and social impacts along the supply chain allows companies to realise cost savings and build capacity to respond to changing market demands.
- **Access to resources:** responsible conduct towards its stakeholders helps the organization gain access to new resources, even in environmentally sensitive areas, which can serve as a major source of competitive advantage for the company.
- **Access to capital/ investor relations:** various sustainability initiatives help the company to lower its risk thus lowering its cost of capital. These initiatives help build investor trust and facilitate access to capital to assist in new investment opportunities.

Sustainability Value Management

	1. Stronger Reputation	2. More Competetive Products; New Markets	3. Improved Productivity	4. Reduced Operational Burden	5. Reduced Supply Chain Costs	6. Reduced Cost of Capital	7. Reduced Legal Liability
1. *Economic Responsibility*							
1.a. Company Economic Prosperity	☆	☆	☆	☆	☆	☆	☆
1.b. Community Economic Prosperity	☆	☆		☆			
2. *Social Responsibility*							
2.a. Respect for Employees	☆	☆	☆	☆			☆
2.b. Diversity, Fair Hiring practices	☆	☆	☆				☆
2.c. Responsible Governance	☆		☆	☆		☆	☆
2.d. Fair Dealing With Customers	☆	☆			☆		☆
3. *Environmental Responsibility*							
3.a. Resource Conservation	☆		☆				
3.b. Waste Prevention Management	☆		☆				☆
3.c. Environmental Risk Control & Restoration	☆		☆				☆
3.d. Reduction of Supply Chain Impacts	☆	☆			☆		☆
3.e. Collaboration With Communities	☆			☆			

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Sustainability Balanced Scorecards

Sustainability Balanced Scorecard Map.

Balanced Scorecard #	What/Which specification:		
	Sustainability Objective (CSF, plan, forecast, budget)	Sustainability Performance Indicator (Strategic/Tactical/Operational)	SustainabilityTarget

Sustainability Balanced Scorecard Matrix.

		What/Which specification:		
	Balanced Scorecard #	Sustainability Objective (CSF, plan, forecast, budget)	Sustainability Performance Indicator (Strategic/Tactical/Operational)	Sustainability Target
Measurement (What are the measurement results)	#			
Reporting (Who is reporting the measurement results to the stakeholders)	#			
Ownership (Whom is the owner of the balanced scorecards)	#			
Measurement (What are the measurement results)	#			
Reporting (Who is reporting the measurement results to the stakeholders)	#			
Ownership (Whom is the owner of the balanced scorecards)	#			

Getting started in making the difference - Developing a Sustainability Operating Model

In today's companies the alignment between strategies, organizational business model, processes and technology is impossible to split from technology. So it is with the efficient execution of sustainability processes in today's corporate world is largely dependent on IT systems. According to a study by McKinsey[36], companies need to look critical at their own technology use. The study argues that the ICT- information and communication technology industry accounts for approximately 2 percent of the global carbon footprint, an amount equivalent to the footprint of the entire airline industry. The IT industry's carbon emissions are anticipated to accelerate to over 3 percent of the global carbon footprint by 2020. I'm not sure that the most companies realize the impact their IT has to the environment. The good news: IT can significantly contribute to control and reduce the 98% of carbon emissions caused by other activities and industries – including transportation, smart grids and more.

In the next pages we will analyze how such a business sustainability framework is supported by the different IT solutions. IT companies like Oracle, SAP, Microsoft, IBM and SUN have been working with their customers and partners to systematically lower the energy required to operate their systems and data centres. These IT vendors also recognizes that its products and services can help achieve significant efficiencies for the remaining 98 percent of the global carbon footprint–emissions produced by all other industries combined. For these IT Vendors like SAP, Oracle, Microsoft or IBM, this represents not only an opportunity but a business responsibility. The Mc Kinsey study estimated that the IT industry can help reduce total global emissions by 15 percent by 2020, which is the number needed to stop global warming. There is much to learn from organizations implementing IT Sustainability initiatives.

It's estimated that the enabling role of IT and other advanced technologies can deliver more than 50% of the goals set within the EU Energy Efficiency Action Plan[37]. The economic advantages for businesses with IT enabled sustainability solutions—both large and small—to "go green" are enormous. Not only are energy efficient technology and processes good for their own sake, but they enable most companies to realize dramatic cost savings. This goes to the root of "sustainable development." Economic prosperity and environmental protection must go hand-in-hand. And often, when you improve the efficiency of a product or process, you also improve the environment. It's a win/win situation for companies and society as a whole.

No single piece of information, however, is more compelling than the level of success organizations have seen. The benefit most commonly realized by 68% of companies was the ability to increase features and functionality. This includes enhancements in computing or storage capacity, and meeting employee demands for features or environmental action. Overall, 65% of companies successfully realized one of the major benefits of IT Sustainability – a positive sign for companies considering these initiatives.

A holistic and integrated IT Sustainability Footprint should cover some of the seven distinct competency areas we will discuss in this paper, where the IT enabled sustainability solution combined with an organizations own sustainability ownership and governance can help achieve significant efficiencies:

36 McKinsey & Company (2009). Pathway to a Low-Carbon Economy : Version 3 of the Global Greenhouse Gas Abatement Cost Curve, p. 7
37 AeA Europe, 9-17-07, EU Commission

Energy & Carbon	Energy-efficient Assets	Energy Management	Carbon Management	Smart Grids		
Product Safety & Stewardship	Product Compliance	Material & Product Safety	Recycling & Re-use	Recall Management	Environmental Footprint	Sustainable Design
Sustainable Supply Chain	Procurement	Traceability	Commodity Trade & Risk Management	Resource Optimization	Supply Chain Optimization	
Environment, Health & Safety	Environmental Performance	Occupational Health	Industrial Hygiene & Safety	Emergency Management		
Sustainable Workforce	Labor Compliance & Rights	Diversity	Talent Management			
IT Infrastructure	Availability, Security, Accessibility & Privacy	Green IT				
Sustainability Performance Management	Assured Reporting/Compliance	Benchmarks & Analytics	Strategy & Risk	Financial Performance		

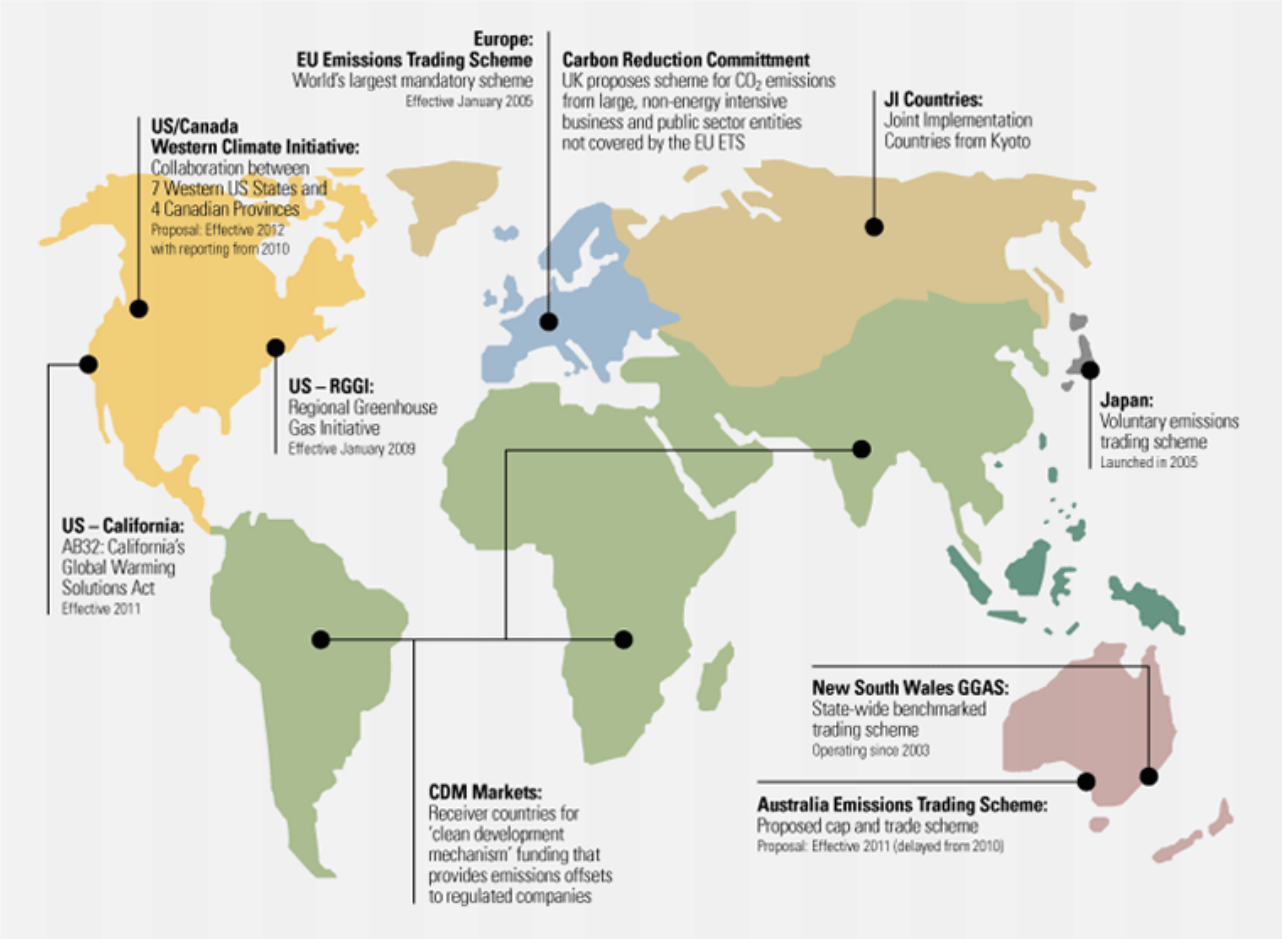
Develop an <u>Energy & Carbon</u> footprint

> *"Energy-related carbon dioxide emissions, resulting from the combustion of petroleum, coal, and natural gas, represented 82 percent of total U.S. greenhouse gas emissions in 2006." (U.S. Environmental Protection Agency)*

Energy consumption and climate change are highly correlated. Some of the IT enabled sustainability solutions incorporate the links between greenhouse gas (GHG) emissions and energy consumption. To put it simply, if a company reduces energy use, the company will reduce GHG emissions. Companies need short-term solutions to optimize energy usage and better understand their GHG emissions. In the long term, they want to optimize the usage and financial impact of energy and reduce GHG emissions.

Energy is a key contributor to carbon and other GHG emissions. Recent energy prices have seen extreme volatility because of supply-and-demand imbalances and financial speculation. Most energy experts anticipate a return to higher energy pricing when the current economic downturn ends. The ability to manage the acquisition, use, and cost of energy will be critical to combating climate change and to promoting sustainable, profitable growth.

GHG regulations are changing all over the world and are heavily impacted by the Climate Change conferences (here an overview of the Kyoto protocol).



The IT industry directly generates approximately 2 percent of the global GHG emissions, but the hardware, software, and services industries can impact the remaining 98 percent. It is estimated that the IT Vendors like SAP, Oracle, Microsoft or IBM customers represent a significant part of GHG emissions worldwide, so the potential impact of these companies ability to help customers improve their environmental performance is huge.

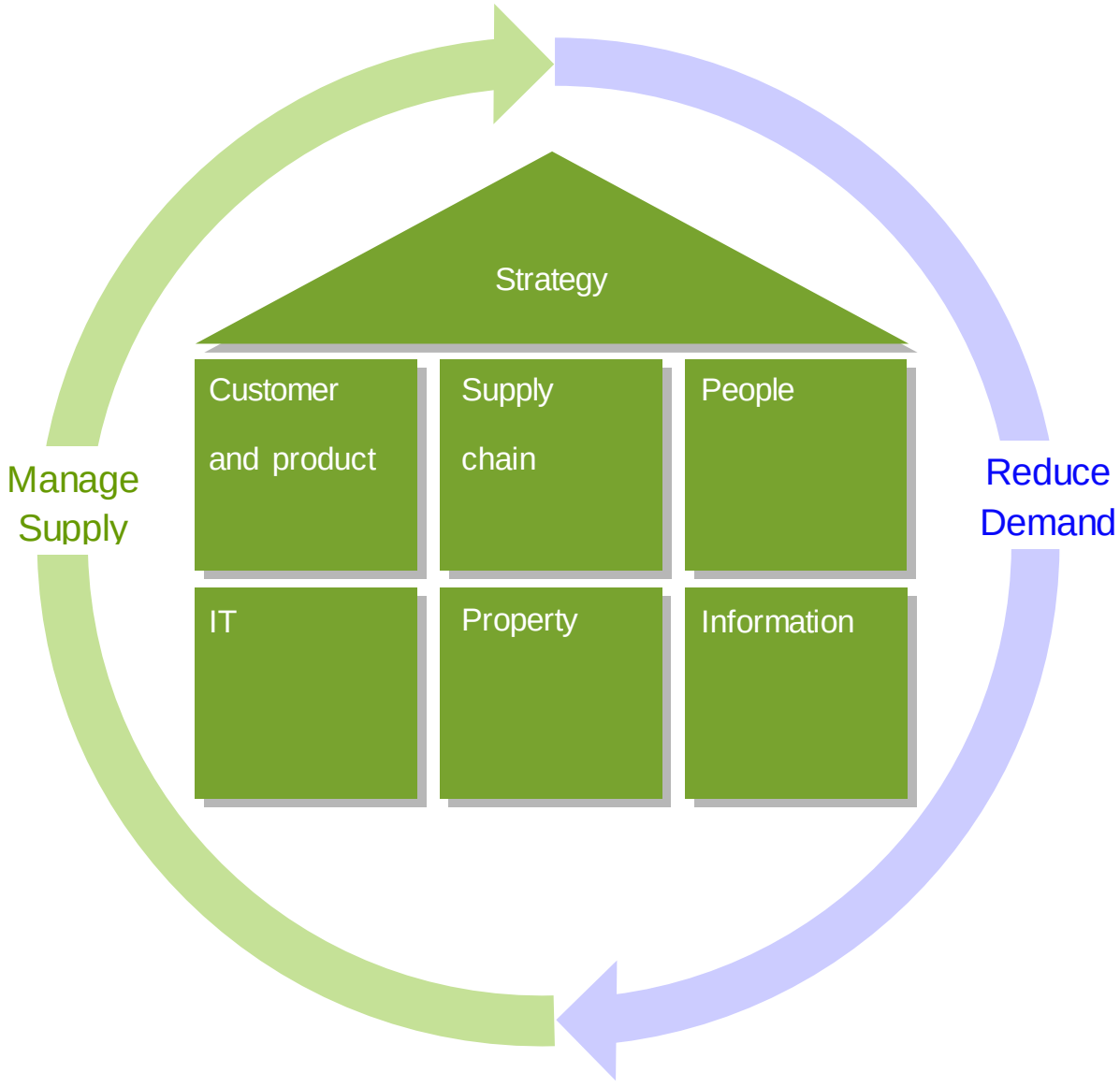
Taking a holistic view balance view of supply and demand framework within an ERP suite that interlinks with sustainability will help organisations develop effective action plans that address carbon across their operations.

It works in two dimensions:

1. Identify where carbon is being generated across the business. By analysing how carbon is generated in the 'rooms' of the house, organisations can decide where to focus and how to prioritise their efforts.
2. The framework then guides organisations to carbon management solutions that help to deliver the carbon reductions in priority operational areas.

The Holistic Carbon view of ERP suite's incorporating sustainability across supply and demand offers a simple and structured approach to a complex problem. It helps break the problem into discrete areas that can be addressed as manageable pieces of work. At the same time, because it views carbon management as an interconnected set of activities across an organisation, the framework helps to ensure the various initiatives combine to meet the targets an organisation has set itself.

Wherever an organisation is in their carbon management journey, the Holistic Carbon view of ERP suite's incorporating sustainability across supply and demand can help. They may need to set carbon reduction goals but don't know where to start, or have agreed targets in place, but aren't sure how to achieve them. If they've already achieved significant carbon reductions, the Holistic Carbon view of ERP suite's incorporating sustainability across supply and demand can help by enhancing existing initiatives, and identify opportunities for further carbon reduction.



Customers are actively looking for ways to monitor, track, report, and trade carbon. Their primary requirement is management at the plant and ERP suite's incorporating sustainability level. Customers are increasingly interested in a more detailed allocation and breakdown of product level reporting–for example, the ability to track energy and carbon amounts by individual package size.

In summary, customers are looking for solutions in energy management and GHG emissions that encompass:

- Visibility and energy optimization of assets
- Energy management for buildings, manufacturing, data centres, and logistics
- Energy mix optimization and data and portfolio management
- Smart meters and advanced metering infrastructure
- Smart customer applications
- Carbon management
- GHG inventory management and abatement initiatives
- Carbon footprint and supply network design
- Cap-and-trade modelling and analysis

IT-enabled Energy & Carbon solution requirements:

Energy & Carbon	Energy-efficient Assets	Energy Management	Carbon Management	Smart Grids

Software designed to help customers better manage energy usage, decrease carbon and GHG emissions, and increase transparency.

Incorporate a Sustainable Supply Chain solution

> *"Product safety issues have an economic impact of more than US$800 billion in injury costs, fatalities, and property damage." (U.S. Product Safety Commission, 2008)*

The largest portion of greenhouse gas impact for many companies is within their supply chain. With the rise of global business networks and extended global supply chains, companies today can optimize their production, distribution, and logistics to a greater degree than ever before. Supply chain operations–the transporting, storing, and shipping of goods–consume substantial amounts of energy, burn fuel, and release significant carbon emissions.

Companies can improve supply chain performance by consolidating and optimizing orders and shipments as well as by applying greater analytics and consistency to their transportation processes. Supply chain efficiency benefits the environment and can have a positive impact on the bottom line. Companies must also continually monitor suppliers to prevent any involvement with unfair labor practices and to ensure safe working conditions.

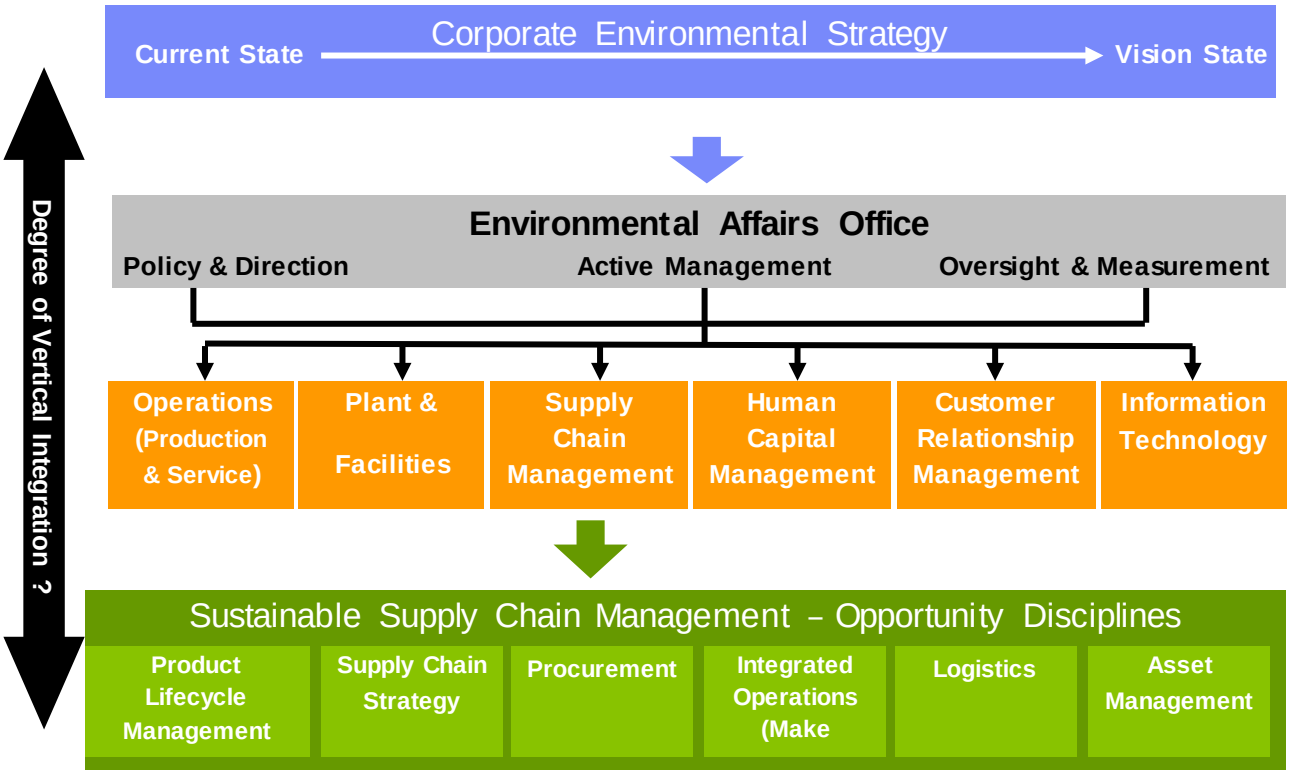
Key sustainable supply chain focus areas include:

- Supplier selection, on-boarding, performance management, and human rights monitoring
- Recall execution and performance and upstream traceability
- Commodity trade and risk management, including commodity exposure management, hedging, and trading
- Supply chain planning, network design, and optimization, including logistics and transportation management

Supply chain activities create significant carbon emissions, making supply chain an important focus for clients seeking to reduce their carbon footprint. ERP suite's incorporating sustainability leverages comprehensive solutions to address sustainability supply chain challenges to diagnose and assess the

impact of supply chain activities (right from procurement to product return) on the environment and helps optimize the supply chain with respect to cost, service, quality and carbon emissions. Sustainability supply chain represents a bulk of opportunities for revenue growth, reduced costs and increased efficiencies.

In the transition to a Sustainable supply chain which emphasizes sustainable procurement is to understanding the organization's existing environmental strategy and the future state vision.



Sustainable Logistics Design

The Sustainable Logistics Design Solution suite enables companies to optimize the design of their distribution and logistics network while balancing key objectives around environmental impact (e.g. carbon, waste, water reduction), cost and customer service levels. These tools enable modelling, scenario development and objective function optimization. Solution suite features Carbon Tradeoff Model, Green SNOW and Warehouse Site Planner.

Sustainable Logistics Design can simultaneously reduce cost and improve environmental performance related to logistics. Reduce risk exposure due to highly volatile energy costs and emerging environmental regulatory schemas such as carbon taxation. Contribute to positive brand image which can translate into marketplace competitive advantage and consumer goodwill.

Sustainable Procurement

Sustainable procurement helps organizations meet their needs for goods, services and utilities in a way that optimizes cost, quality, social responsibility and the environment while enhancing supplier partnerships. Assisting in establishing appropriate purchasing policies to meet varied stakeholder needs, in identifying sustainable suppliers and in managing progress by ensuring and monitoring

regulatory compliance. Sustainable procurement identifies balanced metrics including sustainability, cost and service enables our clients to review procurement relationships and drive improvement in all three categories.

Sustainable Asset Management

Sustainable Asset Management helps companies use their physical assets in a more sustainable way, ranging from real estate strategy to supplier selection, carbon data collation and analysis to ongoing asset lifecycle maintenance and the processes and systems to support these activities. Sustainability focused selection, use and maintenance of assets and supporting activities, including work force, supply chain and data management. More efficient space and utility use within facilities, leading to cost and carbon reduction.

Environmental Product Lifecycle Management

Environmental PLM provides methods and accelerators to enable environmental regulation compliance, packaging improvement and product lifecycle strategy. Product design can influence 80% of a product's environmental impact. DfE-Product Compliance cuts the cost of compliance and cuts the risk of non compliance by providing a dynamic, comprehensive, long-term approach to compliance management. DfE-Packaging provides a win-win where cost savings (transportation and inventory volume) can be made as well as improvements to the environment. It addresses packaging recycling regulations from downstream entities. Product Stewardship & Lifecycle Design aligns product design to market strategy, moving companies from risk/cost avoidance to product innovation/revenue generation. It enables companies to transform point solutions into an integrated product design strategy while being environmental friendly.

Sustainable SCM Strategy

Sustainable SCM Strategy helps incorporate 'Green' into their core business strategy by determining the current carbon usage and developing a coherent energy and environmental strategy which is communicated to the stakeholders. The Sustainable SCM Strategy suite consists of Sustainable SCM Health-check and Strategic Carbon Management diagnostic tool. Assisting in understanding and supporting new sources of revenue and increased market share and establishing goodwill to retain and attract customers.

Sustainable Logistics Operations

Sustainable Logistics Operations featuring advanced algorithms to assist clients during logistics operations and execution to determine optimal routing, mode mix, and service level agreements. Sustainable Logistics Operations reduced cost as a direct result of re-evaluating and optimizing routing, modes, shipment load (consolidation) and frequency of delivery policies. Reduce carbon emissions.

Sustainable Integrated Operations

Sustainable Integrated Operations includes: Production carbon management and operations improvement for waste reduction & recycling. Energy management for thermal efficiency and energy use monitoring. Includes green sigma efforts focused on energy and water. Sustainable Integrated Operations support in cost management, meeting regulatory requirements, meeting customer requirements around sustainable operations or reporting of environmental KPIs.

Business Process	Description	Benefits
Part Number Management	Enterprise-wide database for management of component part numbers, descriptions, selection criteria, and approved usages.	Enables part-number traceability across the enterprise for reduced product cost, improved time-to-market, and improved product quality.
Sustainability Change Management	Enterprise-wide system to capture, analyzes, and reacts to supplier manufacturing process changes and end-of-life notifications.	Enables responses which are fast, thorough, and repeatable, for reduced product cost, improved product quality, and fewer manufacturing interruptions.
Supplier Audit Management	Enterprise-wide system to plan and execute supplier audits, including scheduling, execution, results, corrective actions, and associated technical data.	Enables efficient and effective supplier audits with lowest cost and highest technical quality, for improved time-to-market, improved product quality and reduced product cost. And addresses ethical and environmental requirements of the business
Qualification Management	Comprehensive system to ensure consistent and repeatable qualification of new suppliers, technologies, and manufacturing facilities.	Enables fast and thorough qualifications for product cost reduction, improved product quality, and improved continuity of supply. And analyzes labor and environmental record and principles
Supplier Problem Management	Enterprise-wide database to capture and share information about supplier problems among Development, Manufacturing, and Procurement technical and commercial staff. and labor and environmental concerns	Enables fast and effective communication among stakeholders in both client and supplier organizations for faster problem resolution and cost avoidance.
Real-Time Quality Management	System for real-time acquisition of, analysis of, and response to quality data from suppliers and manufacturing facilities.	Enables fast and effective use of enterprise-wide quality data for reduced product cost, improved product quality, and improved continuity of supply.
Predictive Quality Management	Automated system to warn of potential future quality problems based on predictive analysis of supplier quality data. including virtual supplier auditing	Enables earlier response to, or prevention of, problems in product quality or reliability, for cost avoidance, improved product quality, and improved manufacturing serviceability. As well as labor and environmental requirements

IT-enabled Sustainable Supply Chain solution requirements:

Sustainable Supply Chain	Procurement	Traceability	Commodity Trade & Risk Management	Resource Optimization	Supply Chain Optimization

IT enabled sustainability solutions should addresses the challenges of sustainable supply chain across:

- Sustainable procurement (by conducting routine supplier evaluations)
- Sustainable logistics and fulfilment within the Transportation Management application
- Recall management to support quick and efficient removal of products from the marketplace
- Commodity trade and risk management, including commodities trading, hedging, and managing commodity exposure

Currently IT vendors supply chain management (SCM) application helps improve planning, execution, and collaboration across the supply chain. However companies should be able to increase energy efficiencies by improving demand planning and forecasting for safety stock, inventory, and distribution. SCM with a sustainability angle could also helps companies execute on order fulfilment, procurement, transportation, and warehousing more efficiently in terms of energy consumption.

The existing SCM solution promotes collaboration with suppliers, customers, and contract manufacturers to promote supply chain practices. Therefore the IT enabled sustainability solution should also offers global trade services (GTS) to help maintain accurate and complete export documentation, promoting transparency in goods movement and helping to fulfil regulatory reporting requirements.

Incorporate sustainability into the Environment, Health & Safety policies, guidelines, standards and procedures

> *"The average fine for environmental non-compliance is US$9 million per occurrence."*
> *(Karpf, Lott, Rankine–University of Chicago School of Law)*

Protecting people, keeping workers safe, and ensuring air and water quality is a legal and moral imperative of any IT enabled sustainability solution–and it extends up and down the supply chain. Failure to follow safe working practices and procedures can result in accidents, injuries, and compromised environmental quality.

More serious cases result in hefty civil fines or criminal liability. Some companies struggle to comply with the ballooning number of regulations focused on occupational health, safety, and environmental issues in a cost-effective, organized manner. But beyond complying with incident and emissions reporting, companies need solutions for improving their processes related to environmental, health, and safety planning and prevention.

Organizations are looking for solutions that address a wide range of environmental, health, and safety issues:

- **Environmental Compliance**. Air, land, and water emissions; waste management; and permit and certificate management.
- **Occupational Health**. Health surveillance, medical service and certificate management, health reporting, and disability and rehabilitation.

- **Industrial Hygiene and Safety**. Hazardous substance management, safety management, and incident management.
- **Emergency Response**. Preparedness and crisis response.

IT-enabled Environment, Health & Safety solution requirements:

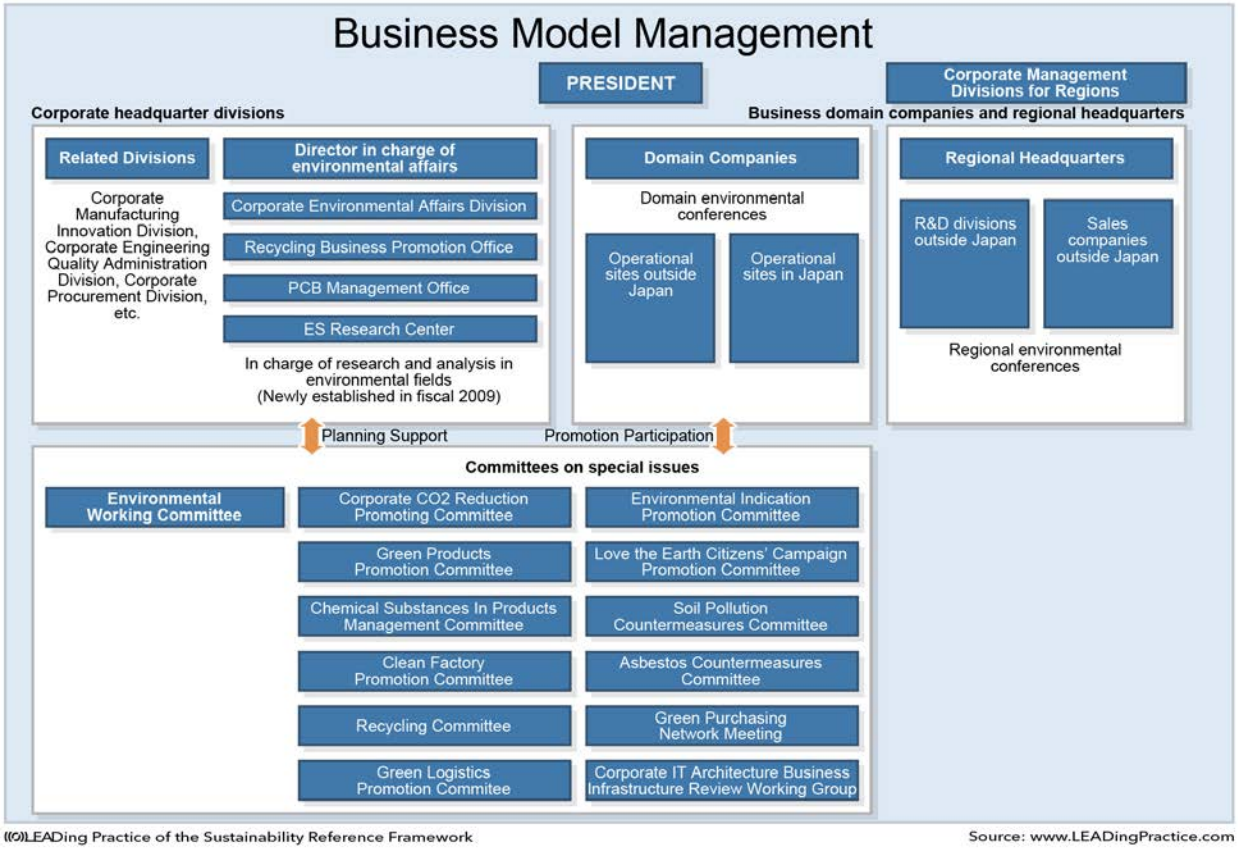
Environment, Health & Safety	Environmental Performance	Occupational Health	Industrial Hygiene & Safety	Emergency Management

The Environment, Health and Safety (EH&.S) Management solution should be able to help customers solve their EH&S needs. EH&S monitoring, reporting, and planning should be embedded into the customers operations and business processes through the deep integration of EH&S process expertise into the IT enabled sustainability solutions.

Incorporate a <u>Sustainability Workforce</u>

> *"There are more than 3.1 billion people in today's global workforce; 60 percent of that workforce is in industry and services." (CIA World Factbook, 2007)*

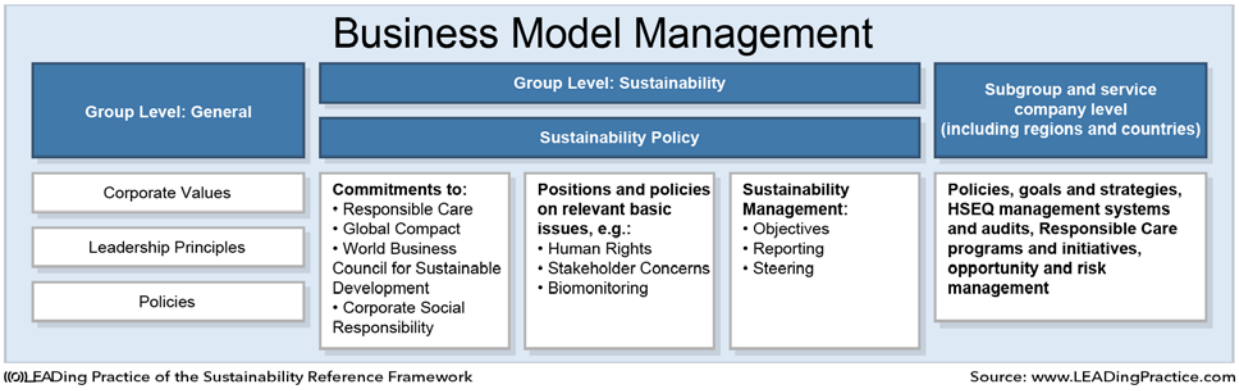
Every business benefits from committed, engaged, and productive employees and society benefits come from the top of the company to the bottom and even new hired workers.



((o))LEADing Practice of the Sustainability Reference Framework

Source: www.LEADingPractice.com

Companies should address labour sustainability compliance from the group level to the subgroup and service company level. Sustainability policy, workforce planning, and diversity and talent management in order to increase productivity and support sustainability strategies should be identified, defined and outlined.



((o))LEADing Practice of the Sustainability Reference Framework Source: www.LEADingPractice.com

At the same time, the challenge to attract and retain the best people is applicable across all industries at every level. Companies need processes to find, nurture, and retain a skilled workforce that can support business and sustainability objectives.

The key elements to attracting and retaining a skilled workforce include:

- Labor compliance and rights, including training, occupational health, and industrial hygiene.
- Diversity planning and performance management.
- Talent management, including career and skill development and training and workforce capacity planning.

IT-enabled Sustainable Workforce solution requirements:

Sustainable Workforce	Labor Compliance & Rights	Diversity	Talent Management

IT enabled sustainability solutions in the areas of Human Capital Management Solutions would require:

- Automates core human resource processes, such as employee administration, payroll, and legal reporting.
- Increases efficiency and supports compliance with changing global and local regulations.
- Equips executives, HR professionals, and line-of-business managers with tools for hiring, training, and developing the best talent.
- Helps align employee goals with overarching business strategies.
- Measures employee contributions to the bottom line.
- Supports shared services and business process outsourcing.
- Integrates training and certification with EH&S solution.

Develop Product Safety & Stewardship within the organization

> *"Product safety issues have an economic impact of more than US$800 billion in injury costs, fatalities, and property damage." (U.S. Product Safety Commission, 2008)*

Companies face many challenges when ensuring product safety, including regulatory risk, revenue impact, and brand value. Overall concern for product safety is driving an increase in material usage and traceability mandates–such as REACH and RoHS–focused on making companies more responsible for product content and disposal.

Ironically, global business networks can actually complicate compliance by extending the need to certify, monitor, and manage safety throughout the product lifecycle across national borders and myriad regulations. In many cases, businesses and consumers need to track raw materials from inventory to finished product to recycling. With today's 24-hour news cycle, social media, and viral internet communications, the mere perception of product safety issues and slow responsiveness can have a detrimental impact. Companies need to be out in front of product issues to protect consumers and to protect their brand reputation.

A product recall can devastate a company's reputation and brand value–and be extremely expensive in monetary terms. To play it safe, companies must be diligent and able to quickly isolate potential quality problems before they impact the consumer. Complying with traceability, recycling, and product safety regulations is not only mandatory, but a good business decision.

In summary, companies are looking for solutions that provide them with the ability to track and manage their product lifecycle, including:

- Product compliance analysis and reporting
- Product safety, including customer instructions, product classification, labelling, storage, handling, and reporting
- Recycling and reclamation, including compliance with WEEE and other reporting and packaging scorecards
- Environmental footprint calculation, including carbon and water footprint
- End-to-end product traceability, impact analysis and response, and recall execution
- Sustainable design, including design for the environment
- REACH and RoHS compliance management and reporting

IT-enabled Product & Safety Stewardship solution requirements:

Product Safety & Stewardship	Product Compliance	Material & Product Safety	Recycling & Re-use	Recall Management	Environmental Footprint	Sustainable Design

An IT enabled sustainability solution should help/support companies develop, produce, and sell safe and environmentally friendly products.

To address product safety and stewardship concerns, the IT enabled sustainability solution should therefore help customers to:

- Minimize the effort required to manage and provide product safety information
- Centrally manage product safety data

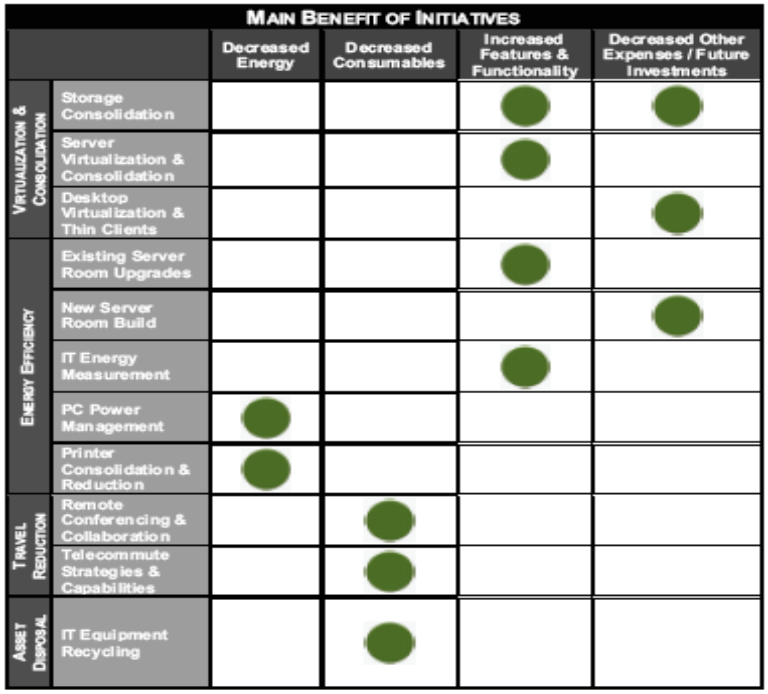
- Provide an end-to-end view of the product lifecycle through the integration of the Product Lifecycle Management, HR Management, Supply Chain Management (SCM), and Transportation Management applications
- Integrate compliance with material usage and traceability regulations into the product design initiatives
- Embed compliance controls throughout the value chain

ENSURE THAT GREEN IT INFRASTRUCTURE IS APPLIED

> *"McKinsey and Company estimates that less than 1 percent of the energy of a data center is actually used to run specific business transactions. The vast majority (up to 90 percent) of energy is consumed by idle computers and for cooling."*

Technology is transforming virtually every aspect of human interaction. People can now access and distribute more information than ever before. However, the explosion in information transfer has compounded issues related to availability, security, privacy, and accessibility. The accelerated growth of digital interaction into our daily lives has heightened the risk of data security for both organizations and individuals. The ability to protect that data to gain and retain the trust of customers and employees is critical.

Furthermore, to provide technological advancements to a global market, the number of data centres has grown and with that there has been a dramatic increase in the energy required to power computer and cool data centres. The largest contribution software and IT services providers can make toward reducing GHG emissions is through enabling their customers to run more energy-efficient data centres and support more sustainable business processes. The chart below displays a research IBM has done on Green IT Infrastructure (IBM 2009) and the main benefit realized by each initiative for the top four implementation drivers: decreasing energy costs, decreasing consumables used, increasing features and functionality, and decreasing other expenses or future investments. Storage Consolidation for example, had two main benefits: the enhancement of features and functionality due to the resulting increased computing capacity and reliability, and the reduction of future investments needed for storage hardware.



In summary, accessibility, availability, privacy, and security are key IT issues on both a corporate and individual level. Additionally, the environmental impact of the IT that we consume can be minimized by data centre efficiency and by more energy-efficient infrastructure and applications.

IT-enabled Green IT Infrastructure solution requirements:

IT Infrastructure	Availability, Security, Accessibility & Privacy	Green IT

Both the interactive components (security, privacy, and accessibility) and the environmental aspect (Green IT) of sustainable IT is important to most IT infrastructure vendors today. Therefore one requirement to a IT enabled sustainability solutions is that it should have a firm commitment to providing secure programs to ensure an individual's right to privacy, and addressing global accessibility standards. This could lead to common sustainability innovation, for example, by providing virtualization tools and technologies. IT can become a critical strategic facilitator, helping companies respond to the urgent challenge of the global sustainability movement in a manner that enables them to adapt and succeed in a rapidly changing social, economic, and environmental context.

Key initiatives:

- Security
- Privacy
- Accessibility
- Green IT
- Green IT Collaboration

Choosing the right sustainability approach - Developing a Sustainability Cost Model

During the last pages we have analyzed how Business Sustainability is a "key driver" of innovation that also yields real rewards rather than extra cost. By designing, innovating and transforming once processes to match the sustainability vision and strategy early adopters can gain the differentiation and competitive advantage they are looking for.

In addition to defining with what and how the company wants to start, a path for the transition should be developed. The strategy as a whole should cover all of the steps in the Sustainability approach. Such a Sustainability approach can be put in three different paths/categories described by Hagemann Snabe, Rosenberg, Møller, Scavillo[38], each with their own strengths and weaknesses:

- **Revolutionary Approach** (or big bang): With this path, the company, business unit, or department wants to get the most benefit out of all of its sustainability processes within the shortest period of time.
- **Step-By-Step Approach** (or project by project): In this case, the company, business unit, or department works on key strategic sustainability projects, not taking into consideration the end-to-end sustainability processes affected.
- **Evolutionary Approach** (or process by process): With this approach, the company, business unit, or department tackles the most critical sustainability processes first, realizing that lower

38 Hagemann Snabe, J. Rosenberg, A. Møller, C. Scavillo, M. Business Process Management – the SAP Roadmap, SAP Press -2009

priority projects not using a sustainability standard approach may be going on in other areas of the company.

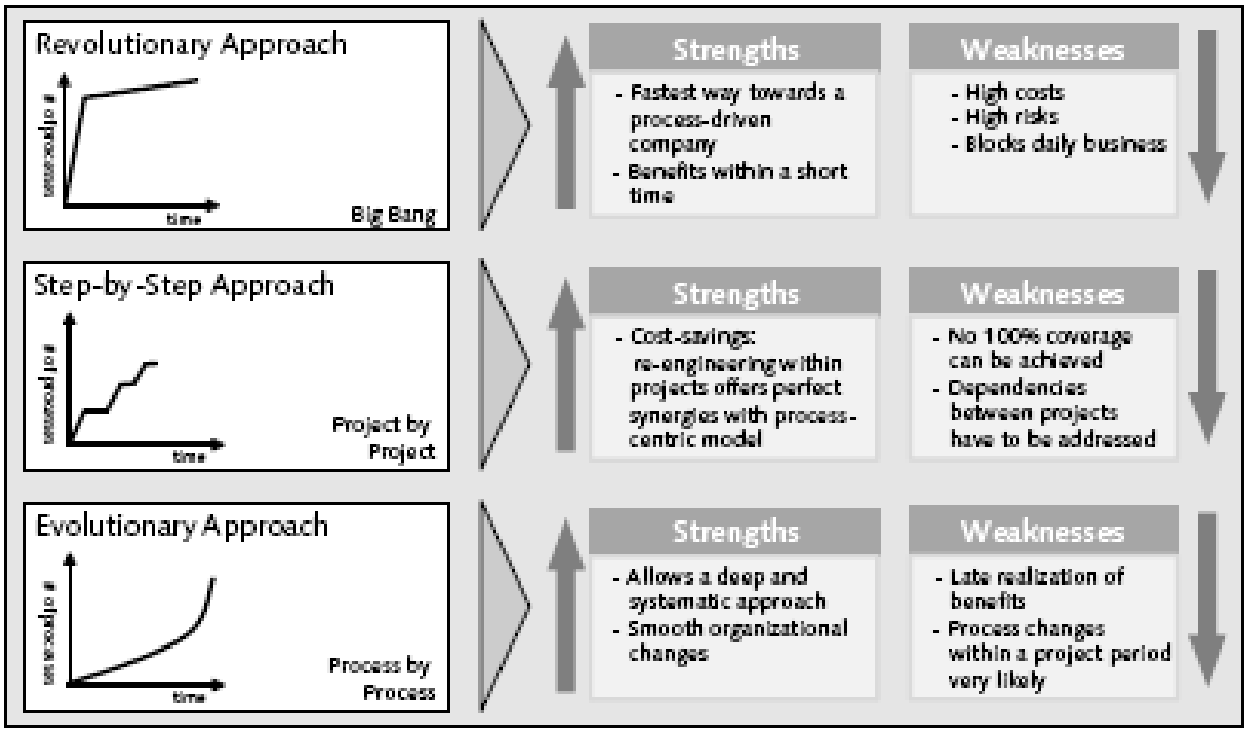


Figure: The Three Transition Paths

Hagemann Snabe, Rosenberg, Møller, Scavillo[39] furthermore described that such a transition can be the same for the entire company, or different paths can be chosen for the different business units or functions.

Many factors influence what path to take, including the size of the company, and its culture. In the following list, four influencing factors are identified to help you determine how the transition should be handled:

- Convenient projects: Opportunities arising from existing projects may exist for creating an ideal sustainability showcase. Or, top management may want to start a new, high-profile project where sustainability could play a vital role.
- Degree of maturity: The cultural maturity of an organization is a critical factor in determining what transition path to take. If process-thinking is already established and strongly supported by senior management, a revolutionary sustainability approach may be best to take advantage of this situation. If the company is still very function-oriented, a step-by-step or evolutionary sustainability approach may be the most feasible.
- Resource situation: The resources available and their skill levels also play a role in choosing the appropriate sustainability approach and transition path. The revolutionary approach requires a large workforce skilled in sustainability management. The other two approaches require fewer resources and allow sustainability management testing in a particular project or on a particular sustainability process.

39 Hagemann Snabe, J. Rosenberg, A. Møller, C. Scavillo, M. Business Process Management – the SAP Roadmap, SAP Press -2009

- Existing pain points: Critical pain points with a high priority may exist in the organization, or in a particular area. These may be the catalyst driving sustainability activities.

Because the sustainability approach and thereby the transition can be considered the keystone to a successful sustainability implementation, it is important to take the time to analyze the organization to determine the most appropriate approach. However, this approach can always be adjusted or changed over time, depending on the changes that occur in the company itself.

Sustainability Cost Map

	What/which specification:				Where specification:		Where specification:		
Cost #	Sustainability Cost Cutting Strategy (Strategic Business Objective)	Sustainability Cost Cutting Objective (CSF, plan, forecast, budget)	Sustainability Cost Cutting Performance Indicator (Strategic/Tactical/Operational)	Business Competency Area	Business Competency Group	Location/place	Sustainability Stakeholder involved	Sustainability Business Unit Owner	Sustainability Area Owner/Manager
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Sustainability Cost Matrix

LEADing Practice Cost Matrix		What/which specification:			Where specification:			Where specification:		
	Cost #	Sustainability Cost Cutting Strategy (Strategic Business Objective)	Sustainability Cost Cutting Objective (CSF, plan, forecast, budget)	Sustainability Cost Cutting Performance Indicator (Strategic/Tactical/Operational)	Business Competency Area	Business Competency Group	Location/place	Sustainability Stakeholder involved	Sustainability Business Unit Owner	Sustainability Area Owner/Manager
Business Area & Group (Which business area and group are involved)	#									
Service Area & Group (Which service area and group are involved)	#									
Business Process (Which business process are involved)	#									
Roles (Which business roles are involved)	#									

Developing a Sustainability Performance Model

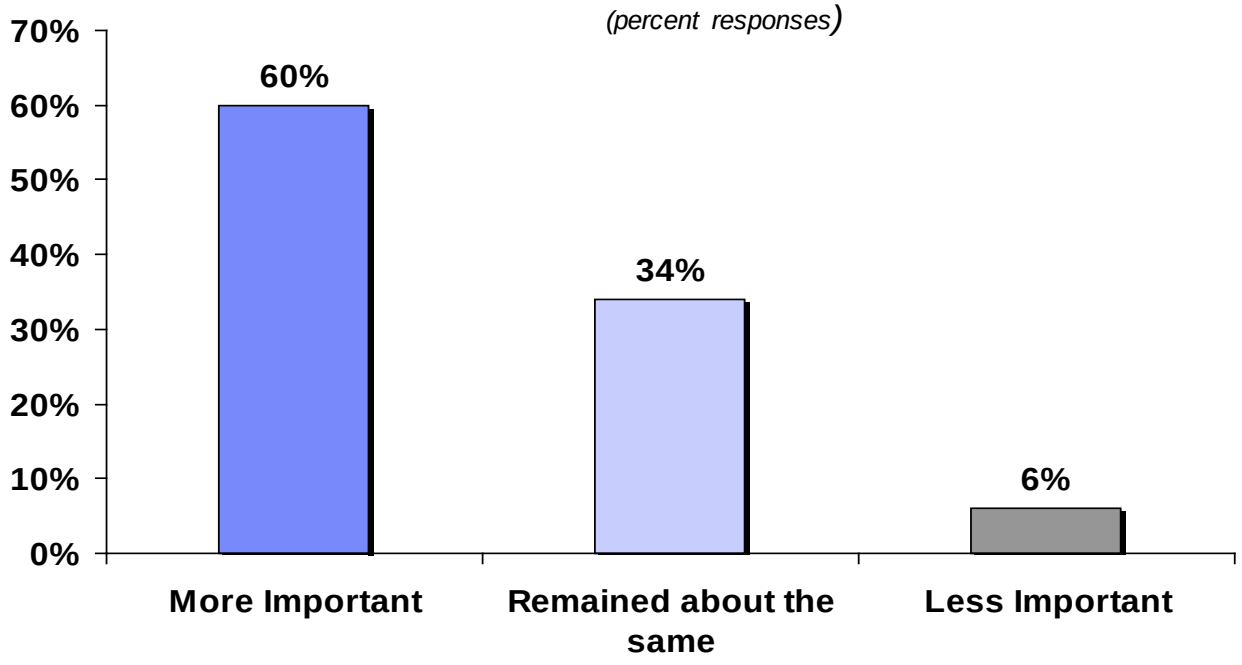
> *"Communicating performance is the #1 sustainability priority over the next five years, according to a 2007 Economist Intelligence Unit survey."*

Even the best-intentioned companies have found real challenge in executing sustainability efforts from the strategic level to the operational processes and activities. It can be very difficult to decide which processes and activities deserve the highest priority, and tangible benefits are hard to calculate. This highlights the potential conflict between sustainability goals and more traditional objectives of profitability and efficiency. Yet, many companies that have not embarked on green initiatives are experiencing public cynicism, stakeholder actions, and the looming risks of government regulations such as carbon cap and trade.

In fact, there is an emerging body of research that suggests a market premium for companies that are effective in executing and reporting environmental and social improvements. Analysis indicates that the economic value may be generally correlated with emerging scores on corporate responsibility indices, such as Innovest's *100 Most Sustainable Companies in the World,* CRO's *100 Best Corporate Citizens,* and the *Dow Jones Sustainability Index*.

Today, more than ever, organizations are focused on environmental and social responsibility as a strategic objective. A 2009 survey of 224 business leaders worldwide by IBM Institute for Business Value in cooperation with the Economist Intelligence Unit, shows that 60 percent of business leaders believe corporate social responsibility (CSR) has increased in importance over the past year. Only 6 percent say it is a lower priority. These responses defy the conventional wisdom that the new economic environment dilutes CSR focus.

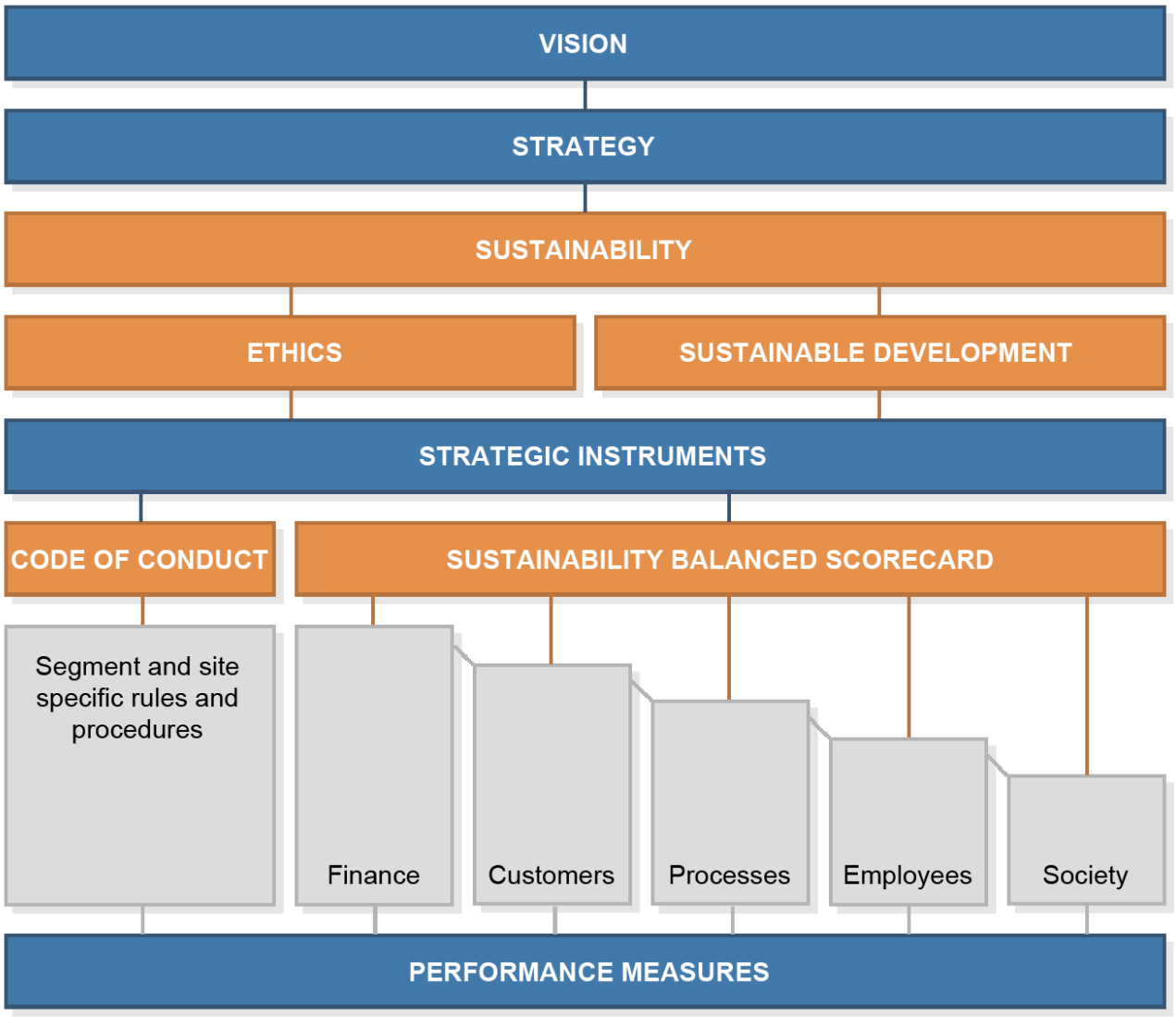
Change in importance of CSR to strategic objectives over the past year (percent responses)



Source: IBM Institute for Business Value 2009 CSR Study

The reality is that corporate responsibility is fast becoming a lens, through which a company is evaluated – by consumers, employees, partners, and shareholders.

Even so, the areas of environmental sustainability and corporate responsibility are still fairly new as value drivers. While they are rapidly emerging and growing in importance, many companies are still in the early stages of adopting a measured approach to sustainability practices. Organizations need to take proactive steps to optimize their business and manage sustainability. Even as companies realize the imperative to act on sustainability issues, they often face a gap between vision, strategy and the sustainability execution.

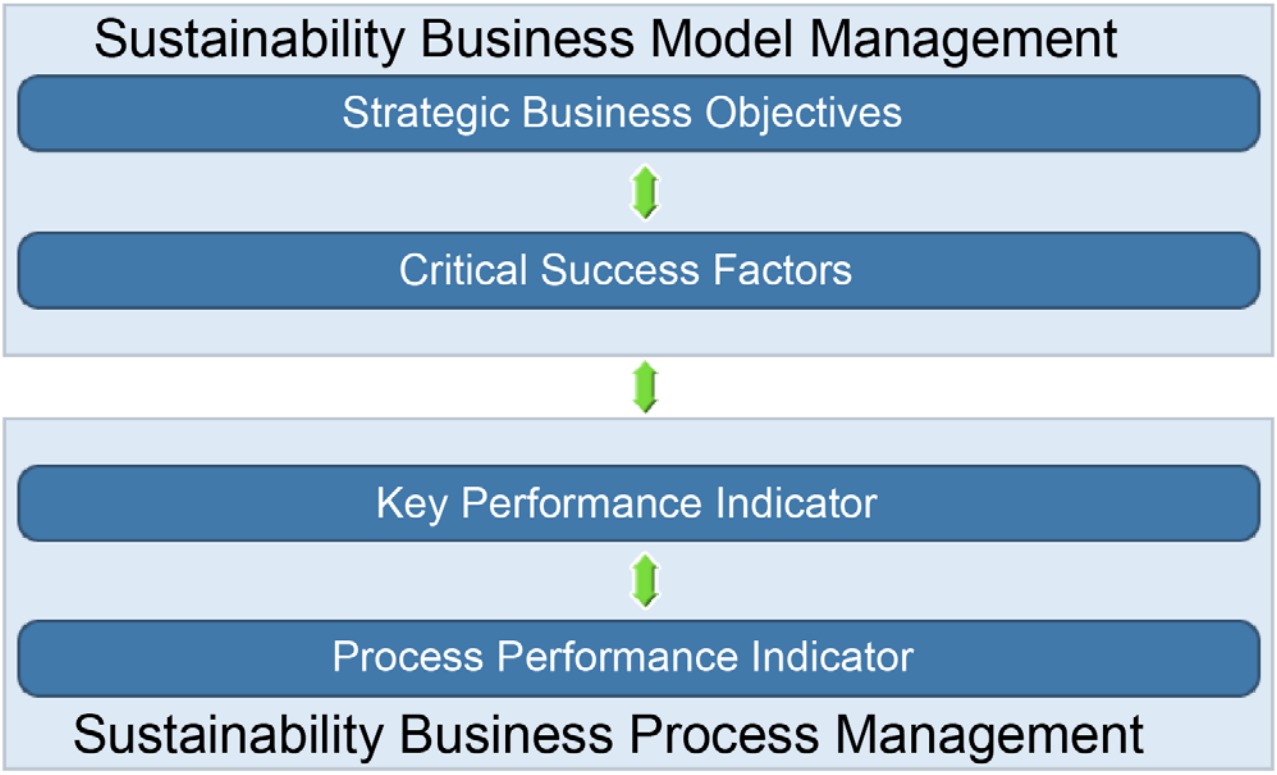


((o))LEADing Practice of the Sustainability Reference Framework Source: www.LEADingPractice.com

Most companies have preliminary sustainability initiatives under way, but customers, employees, governments, and shareholders continue to ask for greater transparency. They want well-developed, efficiently implemented, and clearly communicated sustainability visions, strategies and sustainability programs/initiatives, such as ethics, sustainability development, having the right instruments e.g. software systems, code of conduct and sustainability balanced scorecard, which is connected with the right performance measures/benchmarks, and targets. Moving from a series of ad-hoc activities and a

maze of reporting frameworks to a coordinated, transparent and auditable sustainability strategy and communication program can improve performance and lower costs.

C-level executives need a single solution to holistically manage environmental, social, and economic risks and opportunities and where they can define and cascade goals and build the right performance metrics from Strategic Business Objectives (SBOs), Critical Success Factors (CSFs) and tie them to sustainability Key performance indicators (KPIs) and Process performance Indicators (PPIs) all to give the right performance metrics to the wanted sustainable business model management and sustainability management system.



((o))LEADing Practice of the Sustainability Reference Framework Source: www.LEADingPractice.com

They need to increase profitability while enabling:

- Sustainability goal setting (SBOs and CSFs) and reporting that provides auditable and assured reporting for both regulatory and voluntary KPIs and PPIs.
- Benchmarking and analytics that can compare internal and external data and support what-if analysis and projections measured on KPIs and PPIs and compared to the defined SBOs and CSFs.
- Strategy and risk management that cascades goals (SBOs) and objectives (CSFs) throughout the organization and integrates risk monitoring and response throughout business processes (PPIs).
- Financial performance reporting that integrates sustainability into financial planning processes and focuses on ROI measured on KPIs and PPIs and compared to the defined SBOs and CSFs in order to truly the business return on investment.

IT-enabled Sustainability Performance Management solution requirements:

Sustainability Performance Management	Assured Reporting/Compliance	Benchmarks & Analytics	Strategy & Risk	Financial Performance

Many IT Vendors like SAP, Oracle, Microsoft or IBM helps to bridge the strategy-to-execution gap by combining strategic planning, risk management and sustainability monitoring and reporting. These solutions enable organizations to reduce time spent collecting data, while providing the foundation to improve sustainability performance. With sustainability strategies in place, companies can achieve transparency, protect their brand, better manage risk, and increase returns.

Customers today are leveraging Strategy Management application; Risk Management application; ERP suite's software; and other governance, risk, and compliance solutions to help manage and measure their business. Business Intelligence software allows customers to easily create dashboards to access and monitor performance data. Strategy Management solutions allows organizations to derive the right performance metrics and measurements. Such solutions help enable organizations to drive increased profitability by holistically managing economic, social, and environmental risks and opportunities.

Developing the right Sustainability Governance & Continuous Improvement approach

Sustainability Owner Map

Owner #	Who/whom specification:							
	Sustainability Reporting	Sustainability Business Owner	Sustainability Service Owner	Sustainability Process Owner	Sustainability System Owner	Sustainability Data Owner	Sustainability Platform Owner	Sustainability Infrastructure Owner
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Sustainability Owner Matrix

	Owner #	Who/whom specification:							
		Sustainability Reporting	Sustainability Business Owner	Sustainability Service Owner	Sustainability Process Owner	Sustainability System Owner	Sustainability Data Owner	Sustainability Platform Owner	Sustainability Infrastructure Owner
Business Area & Group (Which business area and group is the owner responsible for)	#								
Service Area & Group (Which service area and group is the owner responsible for)	#								
Process Area & Group (Which process area and group is the owner responsible for)	#								
Requirement (What is the requirement of the owner)	#								
Organizational Construct (Which organization is the owner a part of)	#								

Business Function (Which business function does the owner carry out)	#								
Goal (What is ultimately the goal of the owner)	#								

Mapping the stakeholders and sustainability owners

After the sustainability business model and the sustainability process levels are defined within the company, the basic structure of the sustainability process map exists. The company must now consider the many different sustainability stakeholders and satisfying the needs and wants they have in connection with the sustainability initiatives.

To really develop a practical sustainability approach and commitment at all levels, the company should be incorporating, what different stakeholders "Need" from and "Provide" to sustainability approach:

Sustainability Aspect	Stakeholders							
	Employees		Investors/Lenders		Supply Chain (Customers, Suppliers)		Communities/ Governments	
	Need	Provide	Need	Provide	Need	Provide	Need	Provide
Wise Use and management of Economic and Natural Resources*	- Fair Wages - Tools - Training	- Reliable, Motivated Labor	- Good Reliable Management - Good Return on Investment at Reasonable Risk	- Reliable, Motivated Labor	*Suppliers*: - Sales Revenue *Customers*: -Good Quality, Safe Products Properly Delivered - Reasonable Total Product Cost	*Suppliers*: -Good Quality, Safe Products Properly Delivered - Reasonable Total Product Cost *Customers*: - *Sales Revenue*	-Taxes - Donations - Total Wages - Local Puchasing - Prudent Use of Natural Resources	- Autorisation to Operate - Support Services
Respect for People and other Life**	-Safe and Healthy Working Conditions - Employee Development - Ethical Treatment - Diversity -Management Transparency - Non-Intimidation - Employee Benefits - Recognition for Contributions	-Trust - Safe Workplace behavior - Ethics - Transparency	- Consistant Meeting of Commitments - Good Business Oversight Processes (Governance) - Management Transparency and Ethics	-Trust - Good Business Practices (Ethics) - Long-Term Support	*Both*: -Trust - Consistent meeting of Commitments - Good Business Practices; Fair Dealing - Reasonable Use of Economic Power - Transparency *Customers*: - Accountability for Harm from Products	*Both*: -Trust - Consistent meeting of Commitments - Good Business Practices; Fair Dealing - Reasonable Use of Economic Power - Transparency *Suppliers*: - Accountability for Harm from Products	-Remediation of Environmental Harm - Pollution Prevention - Protection of Biodiversity - Community Safety and Emergency Responce - Support for Community Social Programs - Responsible Use of Economic Power - Transparency	-Trust - Community Safety, Stability - Law Enforcement - Fair Treatment - Transparency

* Comparable to the economic and environmental responsibilities under the Triple Bottom Line and to natural, manufactured and finacial capital under the Forum for the Future/SIGMA approach to sustainability.
**Comparable to environmental and social responsibilities under the Triple Bottom Line and to human and social capital.

For example, employees may want an overall transparency of the end-to-end sustainability processes for which they are responsible or have to work with. They may also be interested in knowing the end-to-end sustainability processes impact, and who the responsible sustainability owners are for these processes. On the other hand, the company may want to provide new hires with the sustainability activities that are relevant for them.

In these two cases, the sustainability business model and sustainability process map as a whole needs to enable different views. The sustainability owner needs to see the end-to-end processes, whereas the new hire may want to not only see the sustainability activities he must work with but also what mandatory guidelines and templates exist for these activities.

Sustainability Stakeholder Map

Stakeholder #	Who specification:	Who - in terms of ownership:			Where specification: Enterprise, Business Area or Group, Service Area or Group, etc.		
	Sustainability Stakeholder	Sustainability Stakeholder	Sustainability Stakeholder	Sustainability Stakeholder	Business/Service Area	Competency Groups	Operational Competencies

		(Business Unit)	(Department)	(Operational Manager)			
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Sustainability Stakeholder Matrix

	Stakeholder #	Who specification (in terms of ownership):				Where specification: Enterprise, Business Area or Group, Service Area or Group, etc.		
		Sustainability Stakeholder	Sustainability Stakeholder (Business Unit)	Sustainability Stakeholder (Department)	Sustainability Stakeholder (Operational Manager)	Business/Service Area	Competency Groups	Operational Competencies
What in terms of context e.g. Performance/Value Expectation	#							
Why specification e.g. Goal/Reason for change	#							
How specification e.g. Expected manner	#							
What in terms of context e.g. Performance/Value Expectation	#							
Why specification e.g. Goal/Reason for change	#							
How specification e.g. Expected manner	#							
What in terms of context e.g. Performance/Value Expectation	#							
Why specification e.g. Goal/Reason for change	#							
How specification e.g. Expected manner	#							

ABOUT THE AUTHOR

Mark von Rosing

Prof. Mark von Rosing is in every way an innovator impacting developments, standards, frameworks, methods and approaches around the world. He founded in 2004, the Global University Alliance (GUA), the largest non-vendor academic platform for academic collaboration. As a part of the GUA work he has been involved of developing 96 Enterprise Standards and 51 Industry Standards. He is a leader in the industry in developing standards. He has not only founded the largest Enterprise Standard community 'LEADing Practice" used by practitioners and organizations around the world, but also has a main role in developing standards in the following standard bodies:

- **World Wide Web Consortium (W3C):** Prof. Mark von Rosing is leading development member of the World Wide Web Consortium. The W3C purpose is to lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web/Internet. Prof. Mark von Rosing is thereby part of developing the internet principles and standards; that will help radically improve the way people around the world develop new technologies and innovate for humanity. See the link under LEADing Practice that is a strategic liaison partner of W3C www.w3.org/2001/11/StdLiaison#L

- **ISO:** As a leader and development member of 'The International Organization for Standardization (French: Organisation internationale de standardization); known as ISO, Prof. Mark von Rosing coordinates the development of international standards-among various national standards organizations. Prof. von Rosing is thereby a leading mind in promoting worldwide proprietary, industrial and commercial standards. The standards focused on at the moment are ISO 42010, the Systems and software engineering Architecture description, as well as ISO 279 the Innovation standard

- **Energetics:** As a core development of the energy standard body Energetics, does Prof. Mark von Rosing, develop the energy standards used by countries and companies around the world. This also includes the standards used by the upstream oil and gas organizations around the world, improving their business model, performance concepts, process models and data models.

- **Object Management Group (OMG):** Prof. Mark von Rosing is co-chair and leading development member of the software standards in OMG. This development includes:

    - Value Delivery Modeling Language (VDML)
    - Business planning and motivation modeling (BMM)
    - Business Process Modeling Notations (BPMN)
    - Semantics of Business Vocabulary and Rules (SBVR)
    - Decision Model and Notation (DMN)

- Risk & Threat Modeling

- **The Information Security Forum (ISF):** Prof. Mark von Rosing is a core team development member of the Information Security Forum. Investigating, clarifying and resolving key issues in information security, and developing best practice methodologies, processes and solutions that meet the business and IT needs around security.

Additional standard development that are worthwhile mentioning:

- Research collaboration and developer with IEEE standards.
- Co-developer of the Global TOGAF Business Architecture Methods & Certification Development Group
- Development member of the NATO standards, including EA, BPM, Capabilities and joint mission execution.
- Built the BPM and EA curriculum for the SAP University Alliance (+ 900 universities).
- SAP AG Method developer e.g. ASAP, SAP Agile, BPM, Enterprise Architecture (EAF).

Author of multiple publications among them the last 3 years:

- SAP Press bestseller: "Applying real-world BPM in an SAP environment"
- IEEE publication "defining the profession of the Business Architect" as well as the publication "How to integrate Enterprise Architecture and BPM",
- Springer: Conceptual Structures in LEADing and Best Enterprise Practices as well as The Impact of Culture Differences on Cloud Computing Adoption
- Future Strategies Inc. and the Workflow Management Coalition (WfMC**)** "Passports to Success in BPM"

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