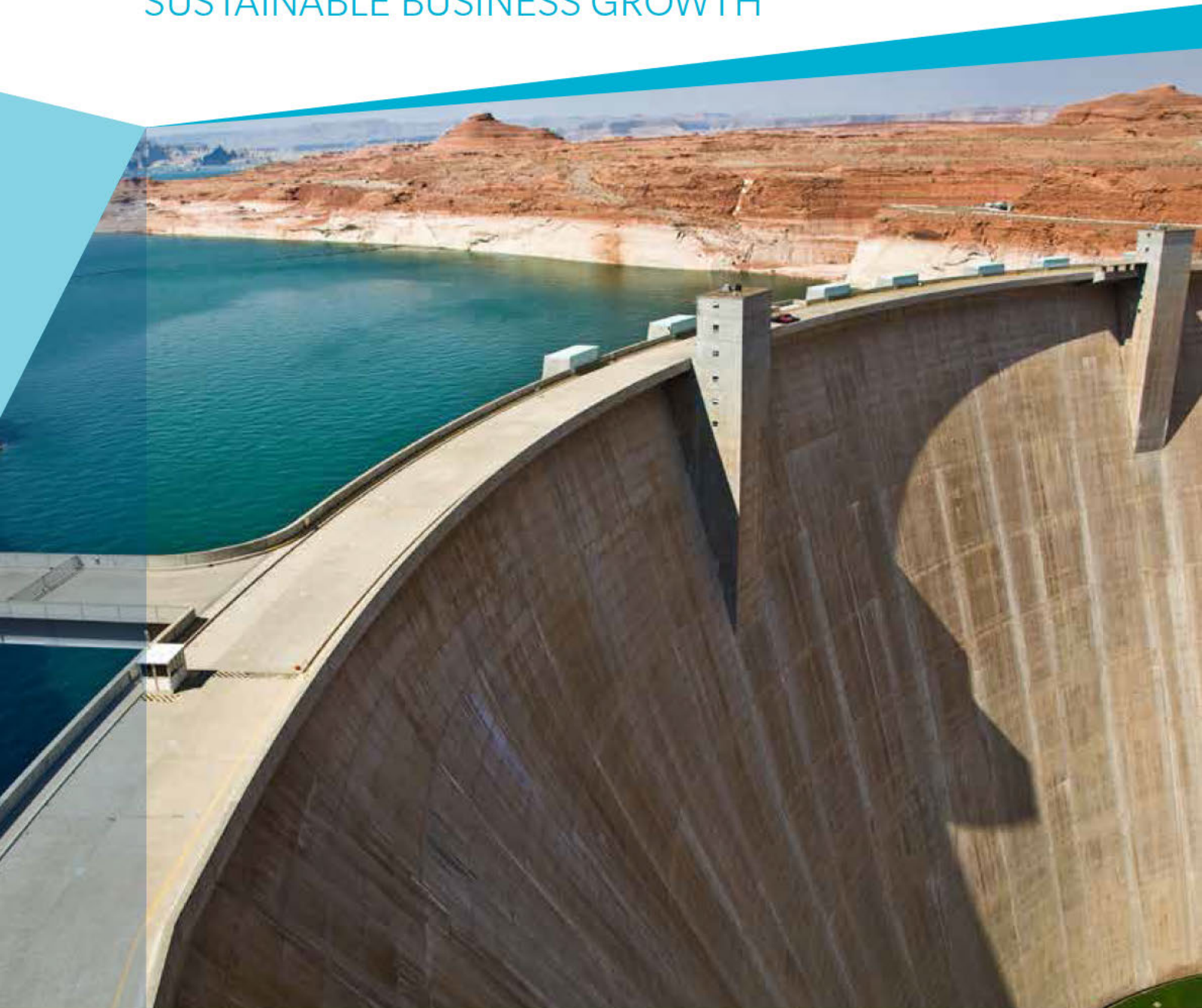


# FROM GREEN TO SUSTAINABLE

DEVELOPING A HOLISTIC APPROACH TO  
SUSTAINABLE BUSINESS GROWTH



# FOREWORD



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With the global population expected to grow to more than nine billion people by 2050, sustaining the earth's resources is one of the biggest challenges facing the world today. A complex issue, sustainability involves interrelated developments ranging from environmental issues such as freshwater depletion, renewable energy, and land use to social and economic issues such as urban planning and transportation, supply chain resilience, and skill shortages.

Sustainability has an impact on every industry, and affects decisions being made throughout a company. Everyone from the facilities manager to the human resources leader to the chief risk officer in companies ranging from retailers to automotive suppliers to technology developers should be considering how to factor sustainability into their plans. The need for companies to act is intensifying: not only do they have to figure out how to deal with scarce resources and with ever more volatile commodity prices, but they also must develop their global growth strategies to account for sustainability challenges around the world.

With this in mind, I am glad to unveil *From Green to Sustainable*. This white paper provides companies in different sectors with hands-on information on how to make sustainability part of their business model.

I hope the paper gives you some new ideas on how to approach this challenging issue.

The capability to incorporate sustainability into strategic and daily decision making is increasingly becoming a must for companies, regardless of their industry. If they fail to place their businesses on a more sustainable basis, they face consumer desertion, potential fines and strictures due to environmental regulation, and the risk of runaway resource costs.

Oliver Wyman has looked at the most relevant sustainability challenges facing the industry today, talked to companies that have pushed the sustainability agenda, and developed a replicable approach to sustainability that is holistic, practical, and industry-focused.

*From Green to Sustainable* shows how sustainability can deliver a strong bottom-line impact. "Green" credentials are no longer enough – companies must become truly sustainable to gain a long-term advantage over their competitors.

I hope you find some valuable ideas herein for your business; we look forward to hearing your comments.



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# EXECUTIVE SUMMARY

Companies today are finding themselves at a crossroads with global implications, as increasingly, they are being required to reconcile business growth with the three pillars of sustainability: economic efficiency, ecological integrity, and social equity. If they fail to do so, they could face existential risks, such as runaway resource costs, consumer desertion, or exorbitant fines.

Many companies, however, are uncertain as to how best to go about improving their sustainability profile and deriving value from the process. A “fig-leaf” approach focused on initiatives that provide “green” credentials is no longer enough to show commitment to the sustainability agenda. Oliver Wyman’s research suggests that companies that take an active leadership position to harness the trends driving sustainability – rather than reactively implementing sustainability in response to regulation and public pressure – will reap the benefits of a new source of competitive advantage and long-term growth.

## Why sustainability matters

As described in this paper, there are a number of trends that are driving industries to establish more sustainable organizations, ranging from resource scarcity and expanding regulation, to increased investor and consumer focus on sustainability. The impact of these trends will vary by type of business and industry, but they are ultimately unavoidable and relevant for consideration by all business leaders.

## Sustainability in practice

Oliver Wyman conducted interviews with a number of firms that are pushing the sustainability agenda to understand how they have used sustainability to improve their bottom line. These companies are reaping value from sustainability because they do not see it as a “trendy” or PR-friendly project; rather, they have proactively developed a comprehensive sustainability strategy and incorporated this strategy into their everyday operations and culture.

## Oliver Wyman’s approach to sustainability

Oliver Wyman has developed a comprehensive, practical, and industry-focused approach that allows companies to extract value from a focus on sustainability. Our experience shows that taking a holistic approach to sustainability does not require complicated methodologies or overly expensive management systems. It does require that companies understand the trends and sustainability impacts most relevant to them, define a set of objectives and solutions, and establish a sustainability transformation plan that will become part of the long-term strategic and operational fabric of the company.

Going forward, a sustainable business model will be critical to achieving lasting success. Many companies have already implemented sustainability initiatives and their businesses have benefited. Better business in a better world is an idea whose time has come.



# INTRODUCTION

Sustainability is one of the greatest challenges facing the world today.

Increasingly, companies are required to reconcile business growth with the three pillars of sustainability: economic efficiency, ecological integrity, and social equity. If they fail to do so, they face the risk of unbearable resource costs, consumer desertion, and exorbitant fines. Going forward, a sustainable business model will be increasingly critical to achieving lasting success.

Indeed, sustainability has become a strategic imperative for companies in all industries if they are to continue to prosper and maintain a competitive edge. All companies need to develop a comprehensive understanding of sustainability and systematically work to incorporate that understanding into their ongoing operations and strategies, with the goal of realizing economic, environmental, and social equity benefits.

Sustainability is a multifaceted and complex issue, extending from climate change and the depletion of natural resources all the way to demographics and skill shortages. It also raises the specter of financial market volatility, far-reaching economic and structural

changes, and tectonic market and competitive shifts. But Oliver Wyman believes that companies that make sustainability a top priority, develop a solid base of knowledge, and put together the right strategic package will gain a huge lead on their competitors.

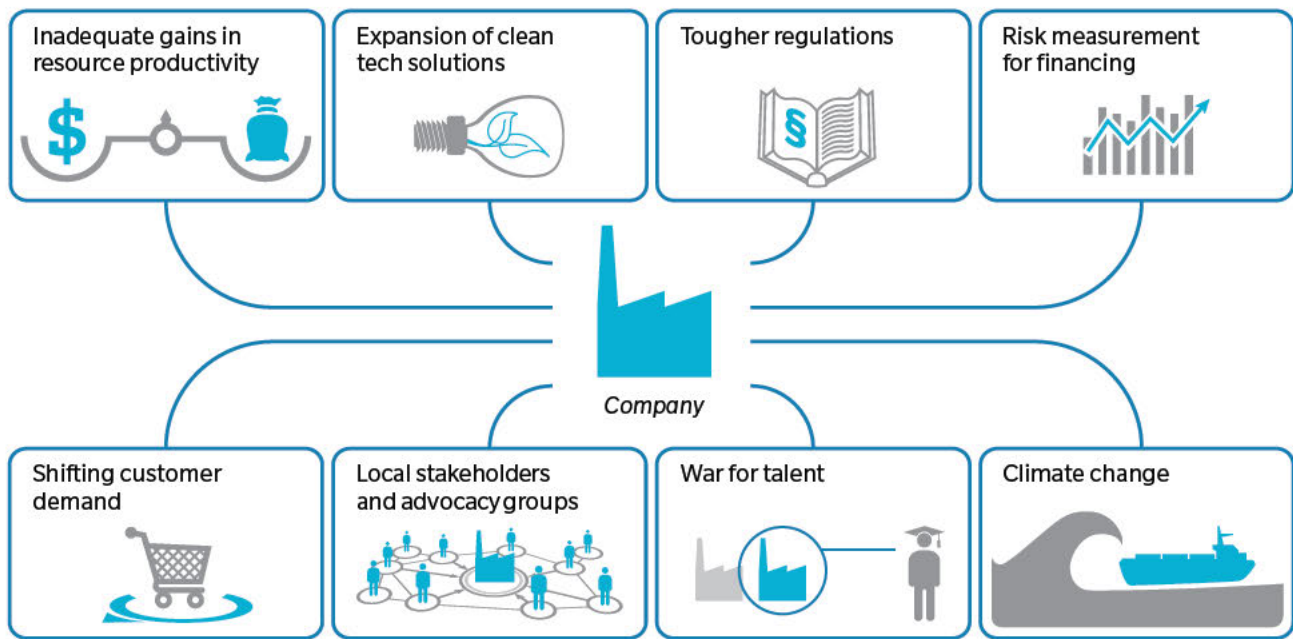
Because sustainability can, in some cases (but certainly not all), represent high upfront investment or opportunity costs, a disciplined approach is required to identify the largest and most value-adding opportunities. As described in this paper, Oliver Wyman's Sustainability Center has looked at the most relevant sustainability challenges facing industry today, talked to companies that have captured value from a comprehensive sustainability program (with a measurable bottom-line impact), and developed a replicable approach to sustainability that is holistic, practical, and industry focused. Oliver Wyman's step-by-step Sustainability Assessment Framework can help companies clearly understand how sustainability impacts their business; how big the potential value pool may be; and what options are available to reduce their environmental footprint, conserve resources, and promote social equity while lowering costs or generating new growth.

# II

## WHY SUSTAINABILITY MATTERS

A number of global trends with regard to natural resources, the environment, and rising social consciousness are guiding companies across industries toward more sustainable practices. Oliver Wyman has identified a set of core trends every business must address, as shown in Exhibit II-1, and briefly described below.

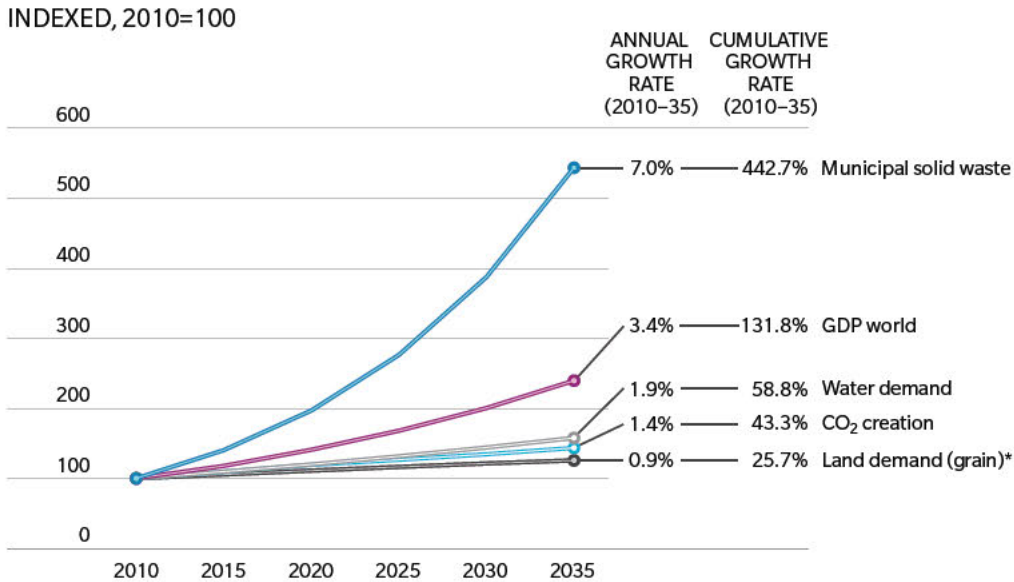
EXHIBIT II-1: MAJOR SUSTAINABILITY TRENDS



## INADEQUATE GAINS IN RESOURCE PRODUCTIVITY

Resource productivity is failing to keep pace with demand (Exhibit II-2). In some OECD countries, gaps have already developed in areas such as energy and water supply. In many non-OECD countries, the situation is even worse.

EXHIBIT II-2: PROJECTED DEVELOPMENT OF KEY RESOURCES AND INDICATORS



Note: Grain includes wheat, rice, and other grains/cereals

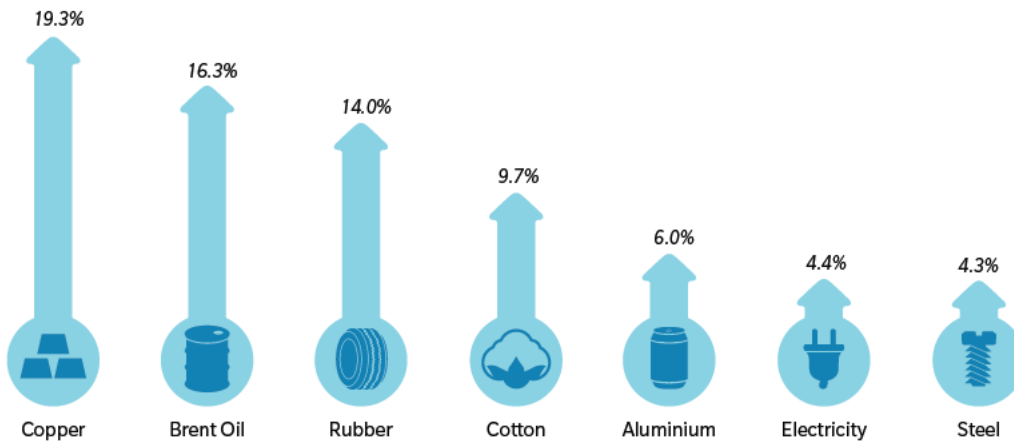
Source: FAO, IEA (2011), EIU, OECD/Maddison, UN, US Census Bureau, World Bank, Oliver Wyman analysis

Critically, growth in demand for products and services is not being adequately offset by improved efficiency in the delivery of services or an increased supply of resources. Increasing demand for a limited set of resources not only raises commodity prices, but results in reverberating volatility down

the supply chain, as “just in time” orders increase and suppliers maintain fewer buffers. Food, metals, and agricultural material prices are not only rising, but have been more than twice as volatile in the past decade as in the whole of the 20th century (Exhibit II-3).

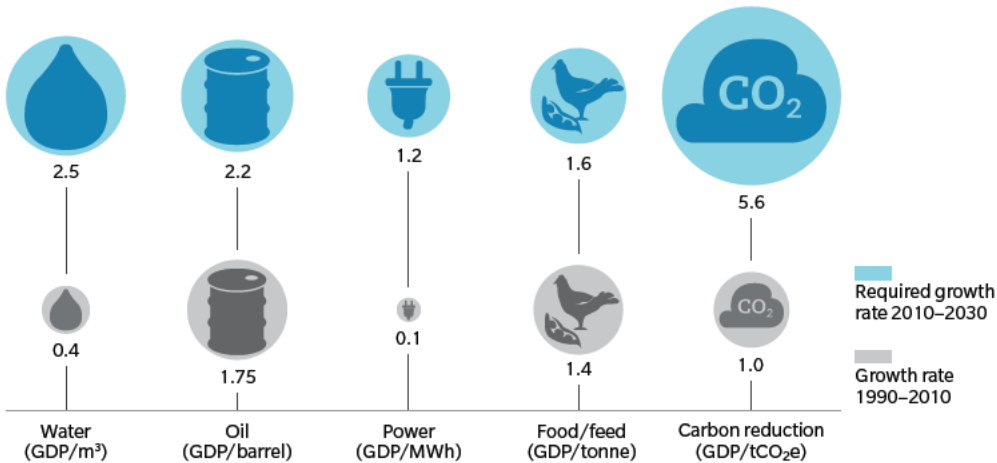
### EXHIBIT II-3: GROWTH OF SELECTED PRICE INDICES

CAGR, 2003-2012



Indices: EUA index, Copper: London Metal exchange copper, Brent oil: BFOE, Rubber: Natural Rubber Futures  
 Steel: North European hot rolled coil, Electricity: VIK index  
 Source: Bloomberg, VIK index, BDEW – Bundesverband der Energie- und Wasserwirtschaft e.V.

### EXHIBIT II-4: ACTUAL AND REQUIRED RESOURCE PRODUCTIVITY GROWTH RATES



Source: GDP: Global Insight; Water: IPCC; Oil: IEA WEO 2008 reference scenario; Power: IEA WEO 2008 (historic), Food/feed: FAO 2009, Oliver Wyman analysis

Going forward, it is likely that companies will be increasingly exposed to critical resource gaps. Key inputs will need to show dramatic productivity increases in the next two decades if supply is to meet demand. For example, during the previous two

decades, the productivity of oil improved by 1.75 GDP/barrel, but the next two decades would need to show a much better productivity growth rate of 2.2. The story for water, power, and food/feed is even more dramatic, as shown in Exhibit II-4.



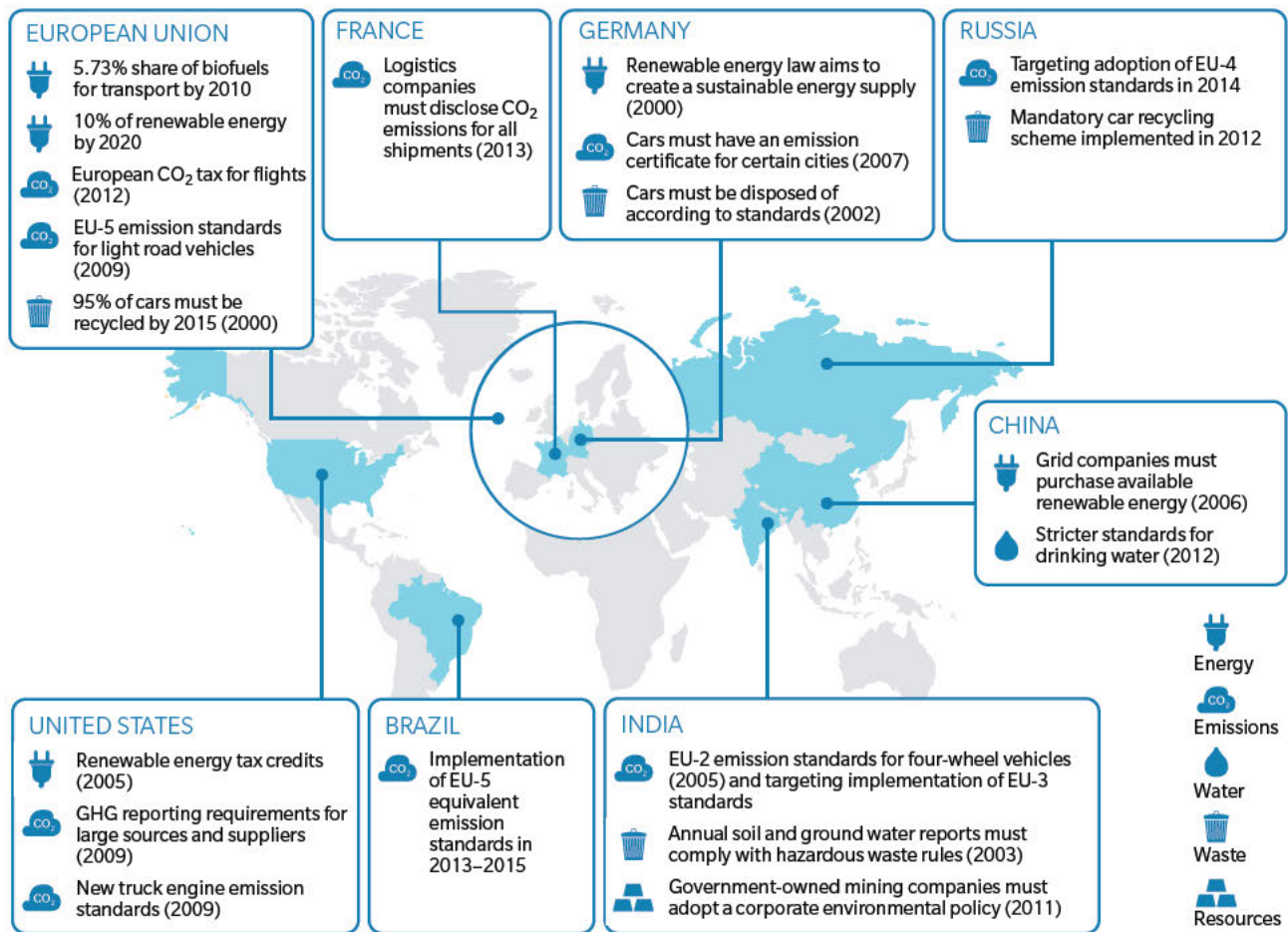
## TOUGHER REGULATIONS

Legislators are writing growing numbers of stringent laws and regulations related to sustainability. Companies need to not only keep pace but be proactive in improving their industries.

The push for regulation is the result of countries worldwide responding to resource supply, resource security, and carbon emissions concerns. The European Union has spearheaded international efforts to improve

sustainability legislation, but countries around the world are now also responding with increased vigor (see example for the automotive industry, Exhibit II-5).

EXHIBIT II-5: EXAMPLE ENVIRONMENTAL REGULATIONS IN THE AUTOMOTIVE INDUSTRY (BY REGION, NOT COMPREHENSIVE)



In the current volatile economy, more stringent regulation has the potential to challenge industry by making cost cutting more difficult. This is because while regulation can incentivize new industries and growth, it can also raise companies' cost bases by imposing the need for capital expenditures on new equipment or facilities, possible fines for non-compliance, and increased operational expenditures. For many companies, the risks associated with impending regulation are unknown, and executives are unsure of what action to take.

Historically, regulatory approaches and emphasis have varied by country, with the Western economies typically leading on more stringent regulations related to environmental pollution.

But it is no longer safe for industry to assume that developing nations will allow lax regulatory control, as they are quickly catching up, and in some cases surpassing, developed nations. For example, Chinese utilities are obliged to purchase any available renewable energy; in Zambia, there are tax reductions in mining areas to stimulate investment in power capacity, especially renewables; and in the UK and France, logistics companies are now obliged to report their carbon footprint, a regulation which is becoming more common. This poses a unique challenge for companies hoping to expand and grow in new markets, as their operations will be increasingly vulnerable to each host country's regulatory priorities.





## RISK MEASUREMENT FOR FINANCING

*Sustainability has become an issue for financial markets: Indices now track sustainability, and investors are more frequently looking at sustainably managed companies as targets for their capital.*

Financial markets and investors have become aware that sustainable companies perform better over the long term. For example, Goldman Sachs in 2010 conducted an assessment to identify companies best suited to deliver long-term performance and found that those which scored higher on a range of “ESG” (environmental, social, governance) factors tended to have higher incremental returns, higher cash returns, and less volatile returns on capital across all sectors.<sup>1</sup> The *Harvard Business Review* also recently reported that resource efficient companies (i.e., those that use less energy and water and create less waste per unit of revenue) tend to produce higher investment returns; they also show better core value metrics, thanks to high levels of innovation and entrepreneurship.<sup>2</sup>

The investment community is becoming increasingly aware of how sustainability not only adds value but mitigates risk by increasing transparency – and thus level of commitment to sustainability is becoming a criterion in long-term investment decisions. For example, the Board of CalPERS – the largest American public pension fund, with \$232 billion in assets – in 2011 approved the adoption of a process for integrating ESG issues as a strategic priority across their entire investment portfolio.<sup>3</sup> And in a 2012 study, the European Sustainable Investment Forum (Eurosif) found that all “responsible” investment strategies had outgrown the market, with four out of six growing by more than 35 percent per year since 2009.<sup>4</sup>

1 “Crossing the Rubicon,” Goldman Sachs, February 26, 2010.

2 “Companies that Invest in Sustainability Do Better Financially,” HBR Blog Network, September 19, 2012.

3 “Towards Sustainable Investment,” CalPERS, 2012.

4 “European SRI Study,” Eurosif, 2012.

## EXPANSION OF CLEAN TECH SOLUTIONS

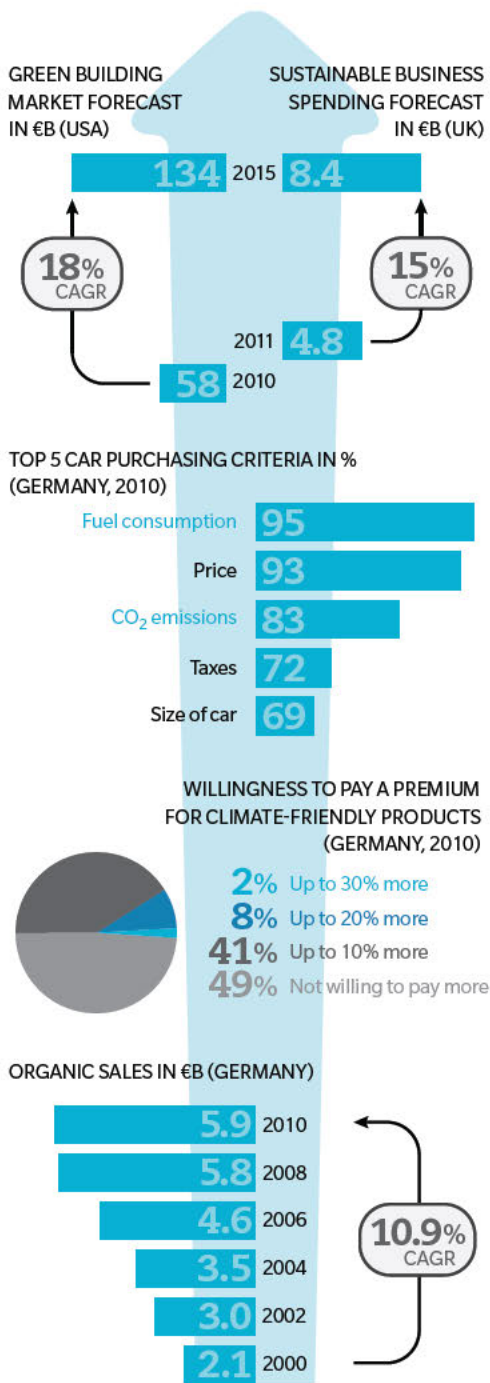
*New technologies and business models that encourage sustainable business practices are sweeping through markets and changing existing industry structures, often opening up new opportunity spaces.*

New technologies, products, and processes are helping “clean tech” combine profitable growth with environmental benefits to boost resource efficiency. Clean tech has the potential to fundamentally change existing value creation and industrial structures – as is already starting to occur in areas such as energy harvesting and storage and 3D printing. A large number of innovative technologies are in the pipeline (e.g., third-generation biofuels), suggesting clean tech’s potential to impact businesses and society at large.

Clean tech is tapping forward-looking markets that exhibit strong growth worldwide. In recent years, the output of installed photovoltaic systems, for example, has soared by an average of 163 percent each year. Clean tech clearly offers the prospect of long-term competitive advantage, and companies will need to weigh the value and risks of successive clean tech innovations. “Doing nothing,” however, will not be an option, as clean tech will disrupt outmoded and wasteful processes.



**EXHIBIT II-6: INCREASING RELEVANCE OF SUSTAINABILITY TO CUSTOMERS (ILLUSTRATIVE)**



Note: US green building market comprises products that maximize a building's energy efficiency. UK sustainable spending includes for carbon reduction, energy mgmt., sustainability innovation.  
 Source: BÖLW 2011, Verdantix, DENA 2010, German federal environment office, McGraw-Hill, Statista/GfK, Oliver Wyman analysis

**CRITICAL BUYING CRITERION**

*For business customers and consumers, sustainability is becoming an important component of purchasing decisions. Many are now willing to pay higher prices for sustainable products.*

Customers are starting to recognize the benefits of sustainable products and services, meaning sustainability is moving from an ancillary feature to a core requirement (Exhibit II-6). Companies with sustainability credentials can effectively promote them to build brand value and customer loyalty. Those who fail to adapt to shifting consumer demand for sustainable products will cede competitive advantage to those who do.

As an example, Switzerland's Coop Group in a 2012 study found that more than three-quarters of Swiss consumers look for meat that has been raised humanely.<sup>5</sup> Coop has responded to demand for more sustainable food through its Naturaplan and Naturafarm product lines, among others, and now has about 40-50 percent of the market for sustainable food products. Through its Naturaline, Coop is also the world's largest supplier of textiles made from fair-trade organic cotton. As demonstrated by its expanding base of products, Coop has turned sustainability into part of its brand identity and a significant source of competitive advantage.

It's not just end consumers who are increasingly demanding sustainability; major companies are also pushing their suppliers to help them meet sustainability goals. McDonalds and Walmart, for example, both impose strict sustainability standards on their suppliers. McDonalds uses an annual supply chain evaluation process to ensure it receives products from legal and sustainably managed lands.<sup>6</sup> Walmart began using a Supplier Sustainability Assessment (SSA) process in 2009 to ensure supply chain sustainability; in 2011, it shifted to a more rigorous system that uses sustainability requirements specific to product categories.<sup>7</sup>

5 "Sustainability Report," Coop, 2012.  
 6 "Sustainable Land Management Commitment," McDonald's website.  
 7 "Sustainability Index," Walmart website.

## MEETING LOCAL/REGIONAL STAKEHOLDER NEEDS

*Local and regional stakeholders are demanding that businesses adopt more sustainable practices, and pose a political/operational risk for businesses that fail to do so.*

Every company seeks to maintain good relationships with a range of external stakeholders, including the local community and local authorities, potential partners, and the media. Local stakeholders will increasingly advocate for a sustainability agenda, and companies can expect that these stakeholders will scrutinize their sustainability practices and react negatively if they do not come up to the bar.

Particularly, companies will need to convince local authorities – who may control access to utilities, land and development rights, and taxes – that they have developed an approach to sustainability that takes into consideration local community impacts. For example, Volkswagen developed a more water-efficient process for its operations in Mexico because groundwater supply was limited and would have been unable to supply both VW and the local community without efficiency improvements.

## WAR FOR TALENT

*A culture change is taking place in the battle to attract talented employees, as companies with a distinct focus on sustainability rank as the most attractive employers.*

Potential new hires increasingly consider prospective employers' sustainability performance when weighing their career options. For example, according to a German survey, 76 percent of respondents considered sustainability as a very important or important factor in the choice of their employer.<sup>8</sup> Similarly, a survey by the Society for Human Resource Management (SHRM), the world's largest association devoted to HR management, found that 49 percent of surveyed firms reported that involvement in sustainability was very important in creating a positive employer brand to attract top talent, 40 percent reported it was very important to improving employee retention, and 33 percent indicated that involvement in sustainability was very important to developing the organization's future leaders.<sup>9</sup>

Staff retention and productivity are also being influenced by whether a company has a proactive approach to sustainability: Sears for example reported a 20 percent drop in turnover after implementing a corporate social responsibility (CSR) program, while a 2002 GlobeScan International survey showed that 80 percent of those who worked for a large company "felt greater motivation and loyalty towards their jobs and companies the more socially responsible their employers became."<sup>10</sup>

8 "Study on Germany, 2010/2011," Haniel.

9 "Advancing Sustainability: HR's Role," Society for Human Resource Management.

10 "CSR Toolkit," Government of Canada.



## CLIMATE CHANGE

*The “risk multiplier” effect of climate change – particularly in the form of severe weather events – will be an ongoing threat to business on a global scale, mandating the need for continuing risk management and scenario-based planning.*

Economic losses from severe weather events worldwide have soared to \$ 1.4 trillion in the past ten years, up from \$387 billion in the 1980s, according to the World Economic Forum’s Global Risks 2013 report. The business impacts have been undeniable: The 2010-2011 floods in Australia, for example, resulted in more than \$350 million in claims to Munich Re; the 2012 drought in the United States led to record-high prices for grain; and severe flooding in Thailand in 2011 seriously disrupted semiconductor manufacturing<sup>11</sup>. Climate change threatens businesses in a number of ways, from resource security and logistics/supply chain risks to increased

regulatory costs and the threat of operational and infrastructure disruption. Climate change is thus a “risk multiplier,” intensifying the need for businesses to assess and respond to the other seven risk factors described herein. In addition, it mandates scenario-based planning and well-defined risk management procedures that consider all links in the supply/production chain. Wider strategic and operational considerations may uncover a need for greater supply chain diversification or a strategy that limits the risk of business interruption by spreading operations across geographic regions.

<sup>11</sup> “Geo-5 for Business: Impacts of a Changing Environment on the Corporate Sector,” United Nations, 2013.

## THE IMPACT OF SUSTAINABILITY TRENDS: THE WORLD IN 2024

As a result of the trends described above, industries can expect the business environment and their marketplaces to change dramatically in the next ten years:

- Environmental taxes will become widespread across most industries and geographies; the cost base for companies with high CO<sub>2</sub> emissions, high energy/water requirements, or high waste disposal volumes will increase substantially.
- Regulation at all levels will become more prevalent, particularly where industries have not been proactive.
- Prices for natural resources will continue to rise, with increasing resource scarcity as population increases and industrialization spreads.
- Investors will make sustainability a standard component of their investment criteria.
- Clean tech solutions will partially or completely disrupt a wide range of industries; those who have failed to adapt will experience diminishing relevancy and competitiveness.
- Business customers and end consumers will require sustainability as a key purchasing criterion; non-sustainable companies also will have difficulty recruiting and retaining talent.
- Local and regional stakeholders will exert increasing pressure on non-sustainable industries and hold them accountable for their impacts on the local community.
- Climate change will continue to be a “risk multiplier”; businesses that fail to plan ahead will see supply chain and operational disruption.

### THESE TRENDS SUGGEST TWO POSSIBLE FUTURES FOR BUSINESS:



**Future #1:** Companies engage only in superficial activities to appear “green,” and as a result are forced by regulation or escalating cost pressures to undertake a more comprehensive sustainability program with competitive and financial penalties for waiting too long to do so.

**Future #2:** Companies start actively looking to implement holistic, practical sustainability programs now – generating strategic leverage that will reduce the specter of regulation and unlock lasting competitive, economic, and environmental benefits.





## SUSTAINABILITY IN PRACTICE: INDUSTRY CASE STUDIES

*The following four case studies provide a snapshot of how companies in various manufacturing and service industries have captured significant value by developing sustainability programs and incorporating them into operational and strategic objectives. These case studies provide a more concrete view of the many discrete opportunities that can exist to increase sustainability. Although several of these programs are still in their early phases and none of the companies described have yet reached a completely holistic level of sustainability, these companies have realized positive financial and environmental impacts while reducing their resource dependency.*

The four cases described in this section are:

- WITTE Automotive, an automotive supplier, which is reducing energy usage through production process improvements
- Robinson-TUI, a resort chain that uses biomass heating and which has developed more-sustainable guest rooms
- Siegwark, a printing ink supplier, which is reducing carbon emissions through process changes and providing sustainability consulting to its customers
- Freudenberg Sealing Technologies, a manufacturer of seals, which has developed more energy-efficient equipment and resource-efficient production techniques

## WITTE AUTOMOTIVE PRODUCTION PROCESS ENERGY REDUCTION

WITTE Automotive (WITTE) was founded in 1899. With annual turnover of more than €440 million, WITTE has locations in Germany, the Czech Republic, and Bulgaria and employs 3,200 people. Through the global alliance VAST, WITTE, together with two US partners, also runs production plants in the United States, Mexico, China, and Brazil.

PROJECT METRICS	
Energy savings per year	600 kWh
CO <sub>2</sub> reduction per year	400 metric tons
Financial savings per year	€100,000
Up-front investment requirement	€150,000
Payback period	1.5 years

WITTE Automotive produces:

- Individual hinge and latching solutions for hoods and tailgates
- Door handles and door locks with patented clasp systems for latching parts, and door lock systems for conventional or sliding doors with or without remote control, including passive entry/passive go
- Energy-absorbing rear seat latches that guarantee maximum protection for the occupant, as well as seat latches with mechanical or electrical signal function and interlock function

WITTE sees sustainability as an opportunity to align with clients and stay ahead of the curve with respect to customer values, foster growth and strong relationships while cutting process costs, and ensure compliance with regulation. WITTE has addressed sustainability driven by the desire to improve the bottom line and satisfy customer demands. As WITTE's CEO Rainer Götz puts it, "We know we have more steps to take until we are fully sustainable, but I have no doubt that we will get there. The automotive supplier of the future can support the OEM not only with sustainable products but also through sustainable manufacturing processes."

### TARGETING SUSTAINABILITY THROUGH PROCESS IMPROVEMENT

WITTE has begun a project that focuses on energy reduction in one of its production facilities in Germany. Thus far, the project has resulted in energy savings of 600 MWh per year, equivalent to 400 metric tons of CO<sub>2</sub> reduction, and cost savings of €100,000 per year. With an initial investment of €150,000, the project's payback period was only 1.5 years.



WITTE AUTOMOTIVE STAMPING PLANT  
IN NIEDERBERG, GERMANY

The project was instigated by management in response to rising energy costs and emissions from machinery at the facility. WITTE investigated four areas for improvement: heating, cooling, aeration and pressure management, and electricity and gas spending. The project includes 32 measures that were implemented in three stages: investigation of the economic and environmental footprint, development of upgrade measures (e.g., equipment upgrades, heat recovery and heat loss reduction, reduced cooling requirements, and innovative re-engineering), and implementation planning and execution.

#### **Example 1: Insulation of injection molding machines**

Molding machines have surface temperatures of approximately 200°C, resulting in high heat losses. An investment of €15,000 funded the insulation of injection molding machine extruders. This resulted in savings of 50 MWh per year and 30 metric tons of CO<sub>2</sub> per year, with a payback period of 18 months. The measure was implemented during normal downtime and maintenance breaks, thus requiring no additional downtime.

#### **Example 2: Low-emissions paint**

WITTE used an innovative paint product to reduce heat emissions from the furnaces of casting machines that have a high surface temperature. Through the use of heat maps, the team was able to directly estimate the resulting savings of 4 MWh and 2 metric tons CO<sub>2</sub> per year, verifying the business case for the paint, which cost €500, with a payback within 12 months.

#### **Example 3: Refrigerant pump regulation**

To save cooling energy, WITTE began to regulate refrigerant pump usage based on cooling system demands, rather than leaving the pumps constantly running. This measure saved 30 MWh and 20 metric tons CO<sub>2</sub> per year, with a payback period of 12 months on an initial investment of €5,000.

#### **Example 4: Die-casting inlet & return water**

To further target pumping energy, the temperature differential between inlet and return water temperatures of the die-casting machines was increased from 6.5°C to 8.0°C, enabling a slower water flow and thus requiring less pumping energy. On an investment of €2,000, the new system setup saves 15 MWh of energy and 9 metric tons CO<sub>2</sub> per year, with a payback period of one year. To improve savings measurement, WITTE has installed energy monitoring equipment to directly track the impact of all 32 measures in the pilot facility. The data will be fed into the company's ERP system and analyzed to develop a quantitative basis for similar future projects at WITTE's worldwide production facilities.

Thus far, the tracked results and feedback from employees on the shop floor have been positive. Motivation is high to improve WITTE's approach to sustainability on an ongoing basis, and the company hopes that the success of the project will help embed sustainability securely as a value across the organization.



Images on pages 24-25 used with the permission of WITTE Automotive.

## ROBINSON-TUI BIOMASS HEATING AND SUSTAINABLE ROOMS

*Established in 1970, Robinson is a chain of club hotel resorts that provide family-friendly sports and health facilities, mainly in Europe, Africa, and Asia. Robinson is part of the TUI AG and consists of 23 clubs and one city house, with a total capacity of 13,000 beds.*

PROJECT METRICS	
Energy savings per year	800,000 liters of fuel oil
CO <sub>2</sub> reduction per year	2,700 metric tons
Payback period	5 years

Robinson is considered a sustainability pioneer within the hospitality industry, due in part (in the early days) to the often remote locations of its resorts. Today, sustainability at Robinson is driven by three main factors: local environmental conservation, providing a good holiday experience for guests, and the need for strong local community relations to maintain operational licenses and support worker relations.

An Environmental Manager oversees the environmental operations of each club and is responsible for implementing sustainability measures and communicating sustainability issues to guests. The Environmental Manager is supported by a central sustainability officer charged with developing new global initiatives, guidelines, and larger projects and linking sustainability initiatives among departments.

### BIOMASS HEATING IN AUSTRIA

Robinson is integrating renewable energy into its asset portfolio. For example, at Robinson Club Amadé in Kleinarl, Austria, biomass is used to provide 100 percent of heating throughout the year. The initial investment in the system had a payback period of 5 years (similar to a comparable oil-fired system).

The project was instigated as part of the normal replacement cycle of the facility's heating system. The Robinson procurement team compared the economic and environmental viability of two systems: a traditional heating oil fueled boiler and biomass district heating. The financials of the biomass system were similar to that of the heating oil system, but offered the added advantage of reducing Robinson's exposure to heating fuel oil price fluctuations while supporting the local economy through the use of locally sourced biomass. The local district heating system today saves 25 percent per year on the cost of operation of a heating oil system, while reducing the club's footprint by 2,700 metric tons of CO<sub>2</sub> emissions per year.

Robinson's biomass heating system serves both the resort and the nearby village of Kleinarl, which on its own did not have the critical mass to justify a district heating system. Sixty houses and the Robinson resort are connected to the 4,750 meters of network, of which only 25 percent is under paved surfaces, allowing for easy maintenance. The system has a 3,770 kW capacity, sells 5,800 MWh per year, and saves approximately 800,000 liters of fuel oil per year. Firing takes place in an automated combustion plant, which can take either dry or moist chips, allowing flexibility in fuel choice according to local availability. Exhaust is treated with a flue gas scrubber unit to remove pollutants. This system is equipped with heat recovery, capturing about 15 percent of exhaust energy through steam condensation while drying the flue gas, making the steam plume from the smokestack almost invisible.



Image used with the permission of Robinson-TUI.

Four other clubs across Robinson's portfolio utilize biomass, some in conjunction with neighboring communities and some as an isolated system.

Another Robinson sustainability initiative is the development of "sustainability rooms": two pilot guest rooms at the Robinson Club Daidalos in Kos, Greece. These rooms are equipped in the same way as standard rooms, but allow guests to monitor their energy and water use throughout their stay and include guides for guests to learn how to save resources. Robinson's aim is to demonstrate to guests in a tangible way that sustainability does not mean a reduction in comfort: just as biomass heating is as warm as oil-produced heat, the "sustainability rooms" are just as comfortable as standard rooms.

**ROBINSON CLUB DAIDALOS  
IN KOS, GREECE**

## SIEGWERK HEAT RECOVERY AND ON-SITE PROCESS IMPROVEMENT CONSULTING

With revenues of €1,011 million in 2012, Siegwerk is a family-owned manufacturer and supplier of printing ink. The company is ranked number three in the world ink industry by revenue and employs 4,400 people worldwide. Siegwerk produces a variety of ink types and is well positioned globally, as it is currently at or near the top of the market for many types of inks.

### PROJECT METRICS (ON-SITE CONSULTING)

CO <sub>2</sub> reduction per year	264 metric tons (10 kg per printing unit)
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Up-front investment requirement	0
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Siegwerk's sustainability activities span environmental, economic, and social dimensions. In terms of environmental sustainability, Siegwerk sees its activities adding value to its business by enabling it to improve its processes (based on environmental impact metrics) and help its clients in turn realize material savings and lean-out production. Siegwerk has assessed sustainability along the entire value chain, with a focus on emission control, surface water protection, energy savings, resource efficiency, and intelligent transport logistics.

Herbert Forker, Siegwerk's CEO, noted that, "As a family-run business, our activity always focuses on long-term orientation. For us, sustainability is a perfectly normal aspect of our day-to-day activities. As a company with a longstanding tradition, Siegwerk is fully aware of its responsibility toward future generations. We understand this as an obligation to harmonize the ecological, economic, and social impacts of our actions."

### IMPROVING SUSTAINABILITY INTERNALLY AND EXTERNALLY

Three examples of Siegwerk's sustainability focus are its carbon footprinting study, process technology changes at its headquarters, and its collaboration with Bischof + Klein GmbH<sup>12</sup> as part of its On-Site Consulting service.



SIEGWERK'S CARBON ADSORPTION WHEEL

Through its initial carbon footprinting study, Siegwerk determined its CO<sub>2</sub> emissions from production (1-3 kg per kg of ink). It also uncovered two related insights:

- Most (90 percent) of Siegwerk's carbon emissions related to ink production were the result of raw materials selection, with the rest attributable to production (9 percent) and transportation (1 percent). This means that focusing on raw materials and production techniques is the best way for Siegwerk to reduce carbon emissions.
- Ink usually makes up 1 percent of the carbon footprint of completed end products (e.g., packaged foodstuffs).

<sup>12</sup> B+K is a European leading full service supplier of flexible packaging made from plastics, paper, and technical foils.

Based on this exercise, Siegwerk realized that reducing carbon emissions related to its products would require both improving its own processes as well as working with its clients and suppliers across the value chain.

For example, to address sustainability within its own processes and fulfill a regulatory requirement, Siegwerk utilizes adsorption wheel and heat recovery technologies at its headquarters in Siegburg to reduce solvent emissions into the environment and to save energy. The process involves transferring solvent-laden air through an exhaust system, where solvents are recovered through a carbon adsorption wheel. The collected solvents are then transferred to a regenerative thermal oxidation unit, where heat is extracted and used on site for Siegwerk's production processes. Regulations require that solvents are removed from exhaust air, but by adding heat recovery to the process, Siegwerk was able to turn the mandate into an opportunity to reduce energy costs. The technology is not a new innovation in the industry, but the process yields significant benefits, saving 57,000 m<sup>3</sup> of natural gas and reducing running costs by €28,000 per year. The natural gas offset also keeps 143 metric tons of CO<sub>2</sub> out of the atmosphere every year.

To engage with sustainability in the wider value chain, Siegwerk works with its customers through its On-Site Consulting service to help them develop more efficient processes, sharing the resulting savings. For example, Siegwerk worked with Bischof + Klein to reduce B+K's carbon footprint by 264 metric tons of CO<sub>2</sub> (approximately a 60 percent reduction per printing unit), saving €250,000 per year, with negligible up-front capital requirements. The key to achieving these savings was reducing ink wastage in B+K's processes. Siegwerk and B+K developed new standards and a process for adapting used return ink in the ink room using small amounts of fresh ink, bringing the return ink up to print-worthy quality in terms of color and viscosity so that it could be reused rather than discarded.

B+K staff were initially reluctant to implement the changes suggested by the On-Site Consulting team, but they became more enthusiastic once the magnitude of savings that could be realized became apparent. B+K also committed to further applying lean techniques to improve its printing and other processing procedures.



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**FST'S METAL RING PRODUCTION FACILITY**

**FREUDENBERG SEALING TECHNOLOGIES  
ENERGY-SAVING INJECTION MOLDING AND  
IMPROVED MATERIAL EFFICIENCY**

*Freudenberg is a €6 billion family-owned diversified group of companies, consisting of 16 business groups that operate in numerous sectors. Freudenberg Sealing Technologies (FST) provides a broad range of custom-made seals and sealing solutions for worldwide customers in industries such as automotive, civil aviation, mechanical engineering, shipbuilding, food and pharmaceuticals, agriculture, and construction machinery. In 2012, the FST business group generated sales of roughly €1.7 billion and employed more than 12,000 worldwide.*

PROJECT METRICS: ENERGY EFFICIENCY	
CO <sub>2</sub> reduction per year	30 metric tons per machine
Financial savings per year	€5,500 per machine

PROJECT METRICS: MATERIAL EFFICIENCY	
CO <sub>2</sub> reduction per year	2,750 metric tons
Steel saved per year	1,800 metric tons

FST employs a suite of sustainability initiatives to drive cost reduction, materials and process innovation, ensure regulatory compliance, respond to customer demands, and enhance its social responsibility. Each Freudenberg division has its own sustainability team and policies, governed by an overarching company-wide sustainability strategy focused on resource management and overseen by a global board. At FST, energy represents a €40 million yearly cost (80 percent for electricity), while materials account for 40 percent of the company's operational costs.

A few examples of how FST has developed its approach to sustainability include:

- The “Green Book,” a tailored list of efficiency measures applicable to each segment of FST’s operations
- Energy and material savings monitoring and benchmarking for FST processes, reported at the division and global board level
- Educational programs to promote behavioral changes, which resulted in 7,000 metric tons of CO<sub>2</sub> and €4.5 million saved over three years
- Technology Panels, groups of experts responsible for developing and implementing innovative technologies to save materials
- Sustainability workshops to educate employees about sustainability in the workplace and gather suggestions on how to improve sustainability



## ENERGY & MATERIAL SAVINGS THROUGH TECHNICAL INNOVATION

Two examples of FST's success in resource management are its proprietary energy efficient injection molding machines and material-efficient metal ring production technique.



FST'S INSULATED MOLDING MACHINE

### Energy Efficient Injection Molding

FST, in cooperation with a local university and its suppliers, developed an injection molding machine that uses new insulation techniques to reduce machine energy consumption by 25 to 45 percent (0.5 kWh per cycle). This equates to a €5,000 – €6,000 reduction in energy costs per machine per year (and 30 metric tons of CO<sub>2</sub> saved per year). Limited additional capital investment is required to achieve these savings, as procurement costs for the new machines are similar to those for standard machines. Thus the new machines can be substituted in as part of the normal replacement cycle.

The key innovation in the development of energy efficient injection molding machines is specially designed insulation. Normally, injection molding machines heat the entire mold to produce the parts. With the new technology, insulation isolates the areas of the mold that need to be heated from those that do not, thus saving heating energy, pumping energy, and reducing air conditioning requirements.

In addition to better energy efficiency, the new machines improve worker safety and reduce preheating/ setting times from two hours to 14 minutes. Less manual handling of the machines is required and the insulation keeps workers away from hot surfaces.

This machine has been so successful at saving energy that it is currently being prepared for release to the commercial market and could be available within two years.

### Material-Efficient Metal Ring Production

FST worked with suppliers to develop a proprietary metal ring production technique that reduces steel use by an average of 73 percent. On a yearly basis, the improved technology saves 1,800 metric tons of steel, 2,750 metric tons of CO<sub>2</sub>, and eliminates the need for 2,400 liters of drawing oil.

The key innovation in the metal ring production technique involves a shift from the standard stamping process to a newly developed rolling and welding process that requires just one laser for cutting and welding, thus updating the process to use rolled steel instead of stamping.

The technique reduces the lead time and complexity of metal ring production by reducing the number of process stages and enabling metal ring geometry to be managed using the system's computer control panel, rather than physical tool changes. This allows the production of a wider range of different seal shapes while using less expensive tools. In addition, the technique reduces sample lead times, tooling costs for serial parts, and maintenance costs due to less abrasive wear.

Employees benefit as well from the new production process, as physical stress is reduced due to lower tool weights, reduced noise and vibration levels, and the elimination of exposure to drawing oils and oil dust.

Through the development and implementation of this technology, FST has reduced its material input costs, enabling it to respond to high price pressures in the market while developing a competitive advantage in an environment in which OEMs demand increasingly sustainable products. Dr. Arman Barimani, Chief Technology Officer of FST, noted to us that, "Freudenberg's Guiding Principles dictate that the company pursue constant innovation, protect the environment, ensure safety in the workplace, and provide value to its customers. The metal ring production process is a perfect example of how the company is achieving all of these objectives by developing groundbreaking technologies and processes – and our customers benefit from receiving high-quality, precision steel components that require less time to produce."





## OLIVER WYMAN'S APPROACH TO SUSTAINABILITY

While it is clear that a proactive approach to sustainability is essential for companies to capture value and get ahead of emerging sustainability trends – and the case studies in the prior section show that it can be done – business executives still face a lack of clarity when it comes to identifying when and how to take action.

Oliver Wyman interviews with senior managers across industries and geographies determined that while many understand the importance of sustainability and its potential value, few felt they had sufficient information and insight into value levers, best practices, implementation, and developing a holistic approach. Most mid-sized to large companies have a corporate social responsibility report, consider their companies to be “somewhat” green, and believe more is being done with regard to sustainability than 5-10 years ago. But our interviewees also expressed uncertainty about whether their company's current actions were

sufficient for the future – and if sustainability could “do more” in terms of generating operational and financial improvements.

We believe that to have a profound and lasting impact on a business, sustainability must be assessed and implemented along three major dimensions: **Strategy, business elements, and culture** (Exhibit IV-1). Properly addressing all three dimensions will help business leaders answer questions such as:

- How much will sustainability trends impact my business and how urgently do I need to act?
- What are the financial and sustainability potentials for my company? Where is my company now and where can we go in the future?
- What do we need to do to get there? What are our options and what are their benefits? How do I take a holistic approach to sustainability?
- What is the right sustainability transformation plan, given my company's unique constraints?

## EXHIBIT IV-1: OLIVER WYMAN'S SUSTAINABILITY ASSESSMENT FRAMEWORK



Below we consider some of the critical components of sustainability assessment and implementation across the framework.

### STRATEGY

Sustainability strategy influences strategic direction and business resource distribution. Currently, many companies are starting to integrate sustainability into their mission and statement of values, but have not yet grappled with how to make it truly a part of company strategy. Our experience shows that fully integrating sustainability into company strategy is the only way to unlock business benefits. This includes bringing sustainability into the top priorities of the C-suite and identifying appropriate measures of sustainability performance.

A well-defined sustainability strategy will incorporate the following:

- **Sustainability definition:** A clear definition of “sustainability” should be based on the company’s current situation and vision, as well as relevant trends. The process should involve key executives from each functional division and the final definition should be documented and communicated (both within the company and externally).

- **Target definition:** Targets should be ambitious but realistic, covering the full spectrum – economic, environmental, and social – and be broken down to operational levels (BU/country).
- **Alignment with business strategy:** Consideration must be given as to how sustainability will be incorporated into the company’s overall strategic direction; top management must be aligned with the revised strategy.
- **Sustainability agenda:** A sustainability agenda breaks the long-term sustainability program down into manageable milestones (usually annual), with intermediate steps and timing. A Program Management Office (PMO) should be implemented to oversee the program, with a KPI dashboard to track progress.
- **Organization and financing:** The implementation plan for the program should assign roles and clarify interfaces between units. In addition, the business case for individual sustainability measures must be evaluated and required resources allocated.

The key dimensions of the strategy agenda should be checked against all relevant trends, to identify focus areas and ensure no critical areas of alignment have been missed.



## BUSINESS ELEMENTS

Properly embedding sustainability into business operations involves all the traditional management challenges, but is made more difficult due to most managers' lack of familiarity with the topic. In our interviews, many companies identified developing the sustainability business case, measurement, management, target setting, and action identification as their most pressing challenges to implementing sustainability. These challenges are real, but Oliver Wyman believes that they can be overcome through an integrated approach that considers all business elements, how they interact, and what they are trying to achieve.

To achieve a company-wide level of impact, sustainability must be incorporated into the business along the following dimensions:

- **Roles and responsibilities:** Who is responsible for sustainability and the range of their activities must be formalized, with the goal of ensuring fluid project execution and communication flow across business units and geographies.
- **Organizational alignment:** All departments/functions must be aligned around the overall strategy and business model; the interface between sustainability and other functions must be clearly delineated.
- **Internal processes:** How sustainability considerations will play into all internal value chain activities (e.g., sales, logistics, HR, IT) and culture must be defined.
- **External processes/partners:** The sustainability impact of business partners/suppliers should be quantified and integrated into the company's overall footprint. The company may want to screen suppliers based on whether they have mature/active sustainability programs of their own. It can also be useful to partner with peer companies to define regulations and strategy definitions.
- **Monitoring/continuous improvement:** The costs and benefits of sustainability should be quantified and a scorecard tracking system developed to monitor progress against goals, as well as to highlight potential new action areas.

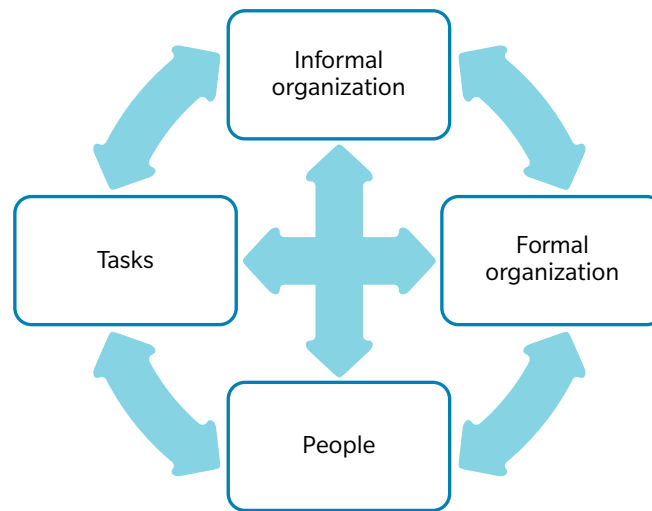
## CULTURE

In our experience, sustainability is often seen by business leaders as a series of operational initiatives, and the importance of embedding sustainability into corporate culture is not well understood. But without a strong culture of sustainability and the support of senior management,

sustainability initiatives will fall flat. To this end, Oliver Wyman addresses the four fundamental components that make up culture in the form of a leadership congruence model (Exhibit IV-2), enabling each one to drive forward organizational change and performance.

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### EXHIBIT IV-2: THE LEADERSHIP CONGRUENCE MODEL



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- **Formal organization:** Consists of formal systems, policies, structures, and processes, all of which must take sustainability into account and reflect its role. Reporting structures and reward systems must support sustainable behavior within the organization.
  - **Informal organization:** Informal relationships and internal networks also can be used to support the sustainability agenda; role models and champions can be used to lead desired behavior.
  - **People:** The characteristics, needs, values, and preferences of employees will influence how

sustainability is communicated and developed; desired skills and ability levels with respect to sustainability efforts should be clearly defined.

- **Tasks:** The workings and goals of the sustainability program (and of any new initiatives) should be transparent to all and evident in daily tasks; employees should be included in program development and educated on the program's benefits.

Through the congruence model, sustainable thinking and action can become part of the company's "DNA."

## IMPLEMENTATION

Implementation of the sustainability program will require potential measures to be aggregated at the company level and prioritized based on required investment, expected benefits, and leverage potential. Quick wins and regular evaluation and recalibration to align the sustainability program with overall business objectives are crucial components.

In summary, extracting business value will require commitment from all parts of the organization. At Oliver Wyman, our experience tells us that this is best achieved by understanding the key sustainability trends, how they impact the business, and the business and environmental potential arising from each. This knowledge can then be used to build a holistic and practical firm-wide sustainability program, with robust management and measurement to ensure the program delivers concrete value in terms of financial, operational, and environmental goals.



## ABOUT OLIVER WYMAN:

Oliver Wyman is a global leader in management consulting that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, and organization transformation. The Sustainability Center at Oliver Wyman supports leading companies and governments around the world in their efforts to foster economic growth while encouraging more responsible use of natural resources and environmental protection. Backed by the deep expertise of our specialized industry practices, we collaborate with clients to identify sustainable solutions across a wide range of industries and in the public sector.

The demand for more sustainable business behavior and products is one of the most powerful trends driving wholesale industry change today, and will be a critical driver of cost control, competitiveness, and growth over the long term. Oliver Wyman offers strategies and tools that can identify opportunities to improve resource usage, capitalize on clean tech, and meet changing customer demands, while mitigating resource-related risks.

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