



SUSTAINABILITY

Is Business

Schneider Electric™
Leadership Series

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Living in a world of data



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Living with finite resources



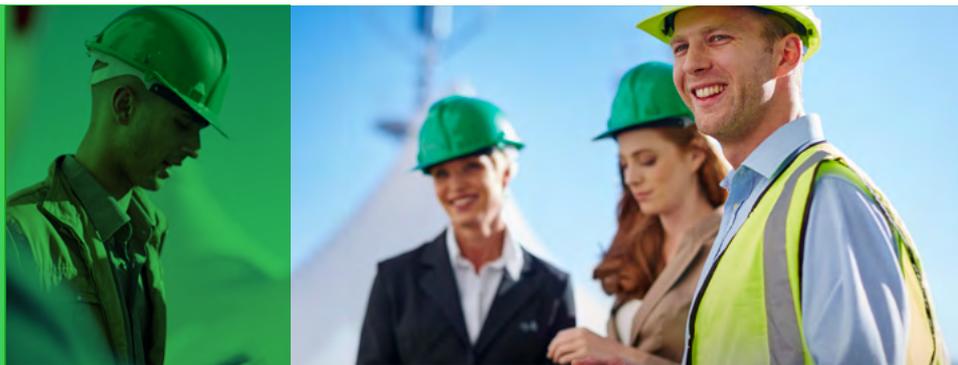
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Foreword

Business leaders worldwide face the dual challenge of managing stakeholder business governance expectations while still delivering a return to shareholders. This difficult balance has prompted a reexamination of core corporate values. Within this context of reassessment, sustainability has emerged as a necessary and important ingredient for defining a company's long-term success.

Of the more than 1,250 responses to the Accenture Strategy's 2016 survey of CEOs of the world's largest companies, 80 percent said they believe that "demonstrating a commitment to societal purpose is already a differentiator in their industry." In addition, 97 percent felt that sustainability is critical to the future success of their business, and nearly as many (95 percent) felt personal responsibility to ensure their company has a core purpose and role in society.¹

Sustainability has evolved from simply being the "right thing to do" to being the "right thing to do to grow business."

In point of fact, sustainability has evolved from simply being the "right thing to do" to being the "right thing to do to grow business."

Sustainability efforts are particularly embraced by companies that have implemented business digitization. By replacing manual processes with software, digitization allows businesses to automatically collect data that can be mined to better understand process performance, cost drivers, and causes of risk. These digitization efforts have enabled sustainability programs to have a more robust impact on corporations and to do so at a substantially lower cost of implementation.

Digitization is already starting to transform the competitive sustainable landscape, which will require all companies to change the way they think about products, technologies, processes, and business models. It therefore comes as no surprise that 75 percent of CEOs see digital technologies as enabling more sustainable business models.²

Beyond sustainability-driven bottom-line and top-line returns, sustainability has proved to be a major contributor to organizational and technological innovation. Sustainability serves as a lens through which business leaders are able to identify opportunities that might otherwise have been missed — to cut costs, reduce risk, and generate higher revenues. New revenue generating opportunities are appearing through the creation of better products that appeal to new audiences. In an effort to support corporate innovation efforts, forward-thinking companies are now treating sustainability as a source for future product and process innovation.



Taken a step further, a customer-centric approach to sustainability creates differentiation far beyond the typical corporate attributes of price, quality, and convenience. To gain this advantage, businesses must be willing to explore sustainability strategies that emphasize the customer and help drive revenue by building long-standing, trust-based relationships with clients. These new points of differentiation are based on delivering products that require fewer resources to create, offering a lower total cost of ownership, and providing healthy and safe solutions.

In the case of thoughtfully designed products, especially those that require energy, the reduced operating expenses over the lifetime of the product can be considerable and may factor heavily into its long-term affordability. The benefits of selecting such products also offers brand enhancement, which is perhaps less tangible but no less important.

Beyond the positive environmental, social, and governance impact they hoped these efforts would yield, forward-thinking companies are being rewarded with long-term economic gain and competitive advantage. Pursuing sustainability has evolved into being the right thing to do to grow business, and the reality is that doing the right thing yields both immediate and long-term rewards.

In its four sections, this report explains trends that are significantly affecting the business world of today.

- Living in a world of data, where digitization is a sustainability enabler
- Living with finite resources, offering strategies for sustainable resource utilization
- Living by principles, and building business resiliency through increased circularity



- Living with integrity, adopting sustainability as an integral part of business risk mitigation

Each section highlights opportunities these trends are creating, along with strategies for making the most of them, and how businesses that adopt these strategies in the pursuit of greater sustainability are minimizing risk, saving money, and creating new business value.

1. Accenture Strategy, "The United Nations Global Compact-Accenture Strategy CEO Study 2016, Agenda 2030: A Window of Opportunity," 2016

2. Ibid.

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Living in a world of data



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Introduction

Technology opens new gateways for understanding, managing, and improving connectivity, which helps businesses identify and respond to the critical need to be planet- and profitability-compatible.

The economic, social, and environmental challenges of unprecedented resource consumption loom large. Globally, greenhouse gas emissions must be dramatically curbed to avoid irreversible damage to the planet that has the potential to radically affect humanity. Evidence of early damage and the disruption it causes has already begun to emerge: unpredictable weather patterns resulting in record temperatures in Australia; superstorms with enough power to devastate parts of the United States and Puerto Rico; sea level rise that threatens nations ranging from Vietnam and Bangladesh, to Ireland and the Netherlands; widespread drought leading to water scarcity throughout Africa and Asia; and mass human migration resulting in a global refugee crisis.

These very real challenges pose a significant and growing threat to business. Leading companies, recognizing these risks, have begun to put their commitments to sustainable practices — such as circularity, efficiency, supply chain engagement, and green power purchasing — at the very front and center of their strategy.

Solutions to these pressing challenges exist in technology. For example, major markets of industry, such as infrastructure and buildings, today consume 70% of the world's energy. Within these same markets lies the immediate potential for much greater efficiency — 82% in buildings and 79% in infrastructure — that can be harnessed through technology.¹

Technology has dramatically increased the effectiveness of modern business. Specifically, digitization and the interconnectivity it has spawned — the so-called Internet of Things (IoT) — are driving powerful new ways to achieve sustainability goals. Information collected through IoT technologies can yield new insights about how resources are used and lead to wider sharing of real-time information, facilitating both human and machine interpretations of these data.

This section will explore how technologies like IoT-enabled smart sensors enable companies to respond to four sustainability megatrends changing the modern business landscape, and how technology is giving organizations the license to set ambitious sustainability goals and make informed decisions to drive the highest planetary and profitability impacts.



How technology helps businesses respond to global sustainability trends

There are four global, sustainability megatrends making a significant impact on the business world today:

- *The increasing need to decouple economic growth from environmental impacts*, to facilitate sustainable resource optimization and reduce threats to business continuity over time.
- *Evolving disclosure requirements*, including the development of metrics and reporting mechanisms to better assess the effectiveness of initiatives and drive business growth.
- *Public pressure and the importance of customer engagement to drive changes in consumer behavior*, especially adopting goods and services built on circularity, which, in turn, nurtures a life-time relationship between companies and consumers and fuels sustainable profits.

- *Digitization, decentralization, decarbonization, and electrification (the 3Ds + E)*, which are changing the way business is done, and requiring data acquisition and analysis that enables information-based decision-making.

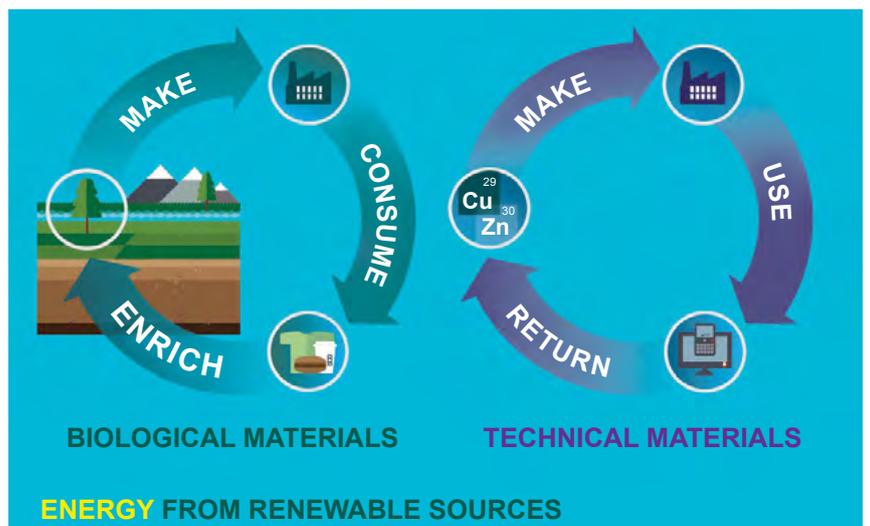


Figure 1 - Progressive manufacturers and their customers think in terms of a circular economy, extending the utility and value of products as long as possible, rather than in terms of the traditional linear approach. Source: kumo.io

Trend 1: Decoupling economic growth from environmental impacts

More than half a century ago naturalist Rachel Carson and others were warning the world of the dangers of pesticides. Today, concerned scientists, social activists, and responsible businesses are rallying support to reverse the tide of resource depletion and environmental degradation.

Humanity is using the Earth's natural resources far faster than they can be regenerated. In 2017, the planet reached Earth Overshoot Day on August 2,² meaning that humanity's demand on planetary resources exceed capacity by nearly half a year. By present consumption rates, it would take 1.7 Earths to regenerate enough natural resources to meet demand, and many industrialized nations use natural capital at twice that rate. Clearly, something must change. An economic strategy of infinite growth cannot continue indefinitely on a planet of finite resources.

Overshoot is driven, in part, by urbanization, which continues at an unsustainable pace; 200,000 people migrate to cities every day. If not managed properly, the costs of

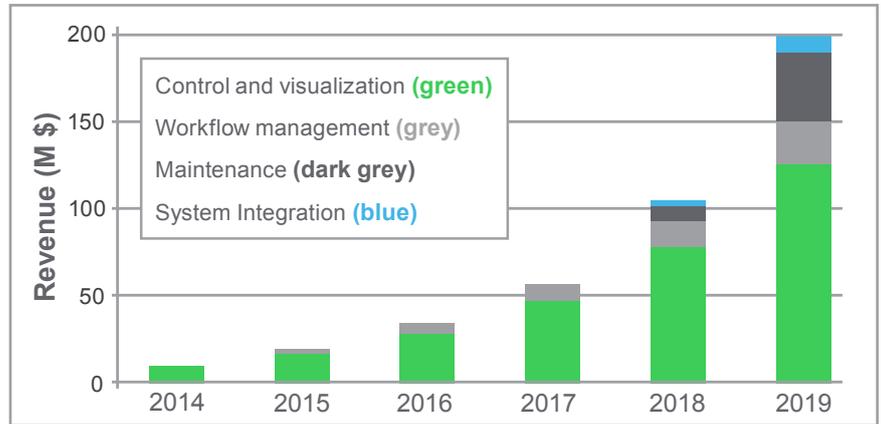


Figure 2 - Global market projections for industrial mobile applications, courtesy of HIS Source: Schneider Electric, May 2016

congestion and pollution combined with the detrimental health effects of such rapidly growing cities threaten future prosperity.³

To respond to the challenge of resource depletion, companies must begin to embrace the idea that economic growth can be decoupled from environmental impacts. This requires the adoption of business models based on systems thinking and circular designed processes, enabled by technology.



Several innovations are likely to be adopted in such models:

Industry 4.0, a current manufacturing trend that emphasizes automation and connectivity. Industry 4.0 comprises technologies such as cyber-physical systems, IoT, and cloud computing deployed in smart factories and through industrial mobile applications, which have undergone remarkable growth that is expected to continue. These systems allow plant operators to make decentralized decisions and achieve efficiencies heretofore unrealized. Schneider Electric’s Augmented Operator is an example of this type of Industry 4.0 technology. It allows machine operators to become more efficient and more effective by increasing knowledge automation.⁴

The size and scope of a large multinational’s supply chain make it the most potent source of sustainability savings.

Green supply chains, which utilize efficiency measures, enhanced transportation networks, an optimized green fleet, and digital capabilities to provide operational visibility from end-to-end.⁵ The size and scope of a large multinational’s supply chain make it the most potent source of sustainability savings — both monetary and environmental. The deployment of technology across the vast web of this chain is critical to efficient optimization and responsible dispatch of resources, as shown in Figure 3.

Everything as a Service (XaaS), which shifts traditional producer-and-consumer business models to ones that move core enterprise processes into a service or prosumer model. This is a logical next step for companies already using innovations like cloud computing. Executive opinions are shifting quickly on this front. A survey by Accenture and HFS found that 68% of participating executives did not think their processes would be delivered as a service within five years, but only a year later 56% were looking to incorporate as-a-service features.⁶



Figure 3 – The sheer size of the Schneider Electric supply chain, shown here at its 2016 levels, illustrates the significant role supply chains play in the overall pursuit of sustainability. (Source: Schneider Electric, “A customer-centric, green vision.”)

Trend 2: Evolving disclosure requirements

Each year businesses devote significant resources to reporting sustainability performance across a growing set of global indices. Since the early emergence of green rating systems in the 1980s, there has been a proliferation of programs designed to quantify building and product sustainability. Worldwide, more than 600 green product certifications exist today with more than 100 in use in the United States alone.⁷

The proliferation of sustainability rankings and reporting standards originally led to a noise of inconsistent, incompatible metrics and formats. Much of what was reported did not reach a diverse set of audiences, such as current and prospective customers and employees, or community groups, governments, and investors. When reports did reach intended audiences, they often fell short of achieving resonance in a meaningful, memorable, and consumable way. However, a range of new policies and recommendations from nongovernmental organizations and standard-setting bodies continue to guide and push ever-greater company disclosure on sustainability performance.

Several indices have emerged as market leading: the Global Reporting Initiative (GRI), the Science Based Targets Initiative (SBTI), CDP's annual reporting and disclosure mechanism (which is responsible for the largest carbon emissions repository in the world), and the Dow Jones Sustainability Index (DJSI).

Better reporting boosts scores

Companies with well-planned sustainability strategies, clear initiatives, and reporting supported by accurate data can improve their scores on global disclosure indexes. Schneider Electric's Energy & Sustainability Services (ESS) has helped many companies achieve their reporting goals. For example:

- Brown Forman, a U.S.-based spirits distiller, has reached the CDP Leadership Index for its initiatives.
- Sporting and music entertainment presenter AEG exceeded its 2020 environmental goal for reducing water usage per attendee through targeting data collection, monitoring and related initiatives.
- Becton, Dickinson and Company (BD) improved its sustainability data collection and analysis as well as its CDP submission. The work has helped BD increase its CDP Climate Change score from a C in 2010 to a B last year. The company also added CDP water to its reporting regimen in 2016.⁸



In addition to their participation in public disclosure indices, investors of all types are increasingly paying attention to sustainability performance due to the high cost of risk, and a growing number of financial institutions have units dedicated to sustainable investing. Many regulators and standard-setting bodies (such as the Sustainability Accounting Standards Board in the United States) have released or are working on new financial disclosure guidelines that highlight the importance of sustainability, and a growing number of companies are facing pressure from investors to be more transparent about sustainability risks and performance. It should be noted, though, that in a 2016 survey of CEOs from around the world, only

10 percent cited pressure from investors as a primary reason to act on sustainability.⁹

The scope of the data streams that must be managed to report to any sustainability index can be overwhelming. It can take organizations many person-hours of dedicated time and attention to prepare a CDP response, for example, and often requires engagement across all sectors of the business. The annual reports required for GRI are even longer, typically needing a year-long engagement to properly develop, report, and implement.

Increasingly, companies are turning toward technology to help them manage the tracking, disclosure, and reporting burden. Solutions such as Schneider Electric's

Tracking Sustainable Companies

The Global Reporting Initiative (GRI) helps businesses and governments worldwide understand and communicate their impact on sustainability issues such as climate change, human rights, governance, and social well-being. The driving and distinctive value behind GRI reporting has been the continuing evolution of GRI's material standards, which have increasingly pushed companies to identify their critical sustainability indicators and to disclose their progress (or lack of) on the select set of those most material to the long-term success of the organization.

The Science Based Targets initiative (SBTI) — a collaborative effort between the UN Global Compact, CDP (formerly the Carbon Disclosure Project), We Mean Business, the World Wildlife Fund, and the World Resources Institute — focuses on challenging companies to set and achieve deep reductions in greenhouse gas emissions heretofore unachieved by most organizations. The initiative showcases companies that set science-based targets; defines and promotes best practice in science-based target setting; offers resources, workshops and guidance to reduce barriers to adoption; and independently assesses and approves company targets. To date, 350 global organizations have joined SBTi, with an average of two new companies joining every day.¹⁰

CDP has significantly helped expand the culture and rigor of carbon reporting and disclosure with its strict methodologies, driven by the demands of its investor base. Its annual reporting request is answered by more than 5,000 global companies. One significant area CDP has developed is the inclusion of emissions reporting by companies' own upstream supply chains. CDP has also developed reporting and disclosure indices for water and forest use.¹¹

The Dow Jones Sustainability Index (DJSI) ratings and rankings also leverage rigorous sustainability assessment methodologies and frameworks developed by RobecoSAM,¹² the Switzerland-based investment specialist focused exclusively on sustainability investing. This significantly helps grow awareness and professionalization of sustainability performance assessment.





EcoStruxure™ Resource Advisor use multiple data streams to create meaningful, digestible, and reportable information dashboards, leading to the visibility and transparency that businesses crave. This equates to better business performance, cost savings, and opportunities for improved efficiency and growth. It also provides easy-to-obtain tools and reports to share progress with all shareholders and community stakeholders.

IoT technologies can further improve efficiencies by providing real-time data and creating traceable, auditable performance footprints. The data driven by these

technologies can enable managers to act based on the insights provided and make more sustainable and profitable decisions. This data can influence the bottom line in numerous ways, including:

- Increased revenue
- Reduced energy expense
- Reduced waste expense
- Reduced expense for materials and water
- Increased employee productivity
- Reduced hiring and attrition expense
- Reduced risks to revenue and the expense of inaction

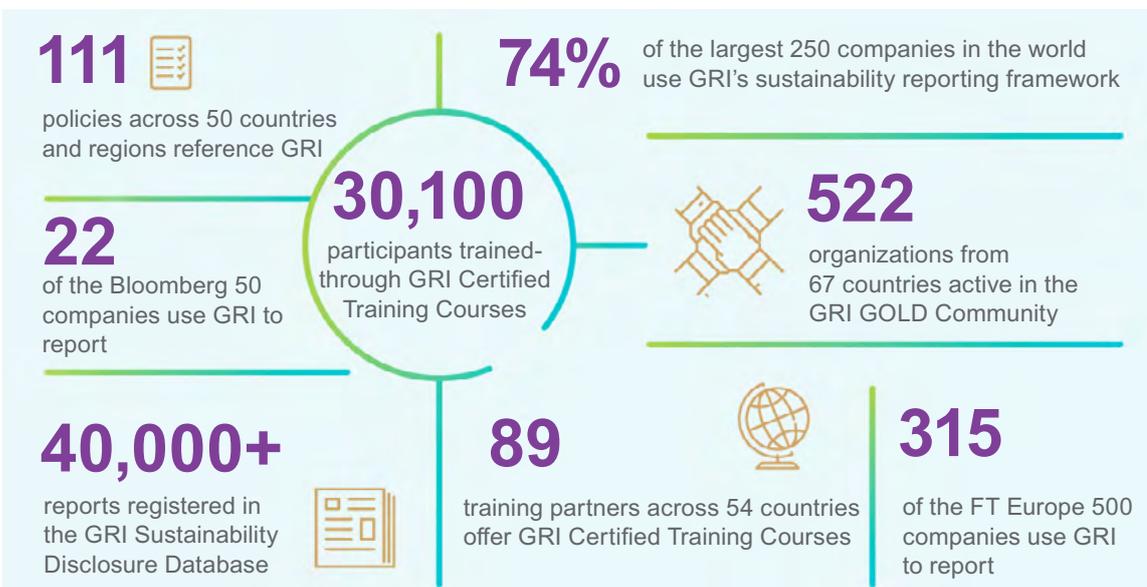


Figure 4 - A few highlights of GRI's accomplishments since it was started in 1997. Source: Global Strategic Alliance

Trend 3: Public pressure, customer engagement, and the need to change consumer behavior

Consumers can be fickle. While there has been growing interest in products that are more sustainable, actual customer behavior has only recently begun to reflect this interest. For instance, a company report released by global products manufacturer Unilever in early 2017 indicates that nearly a third of consumers are choosing brands specifically because they are doing social or environmental good.¹³

To properly address this increasing public pressure in an environment of constrained resources, businesses must understand how to measure, classify, and market sustainable products and services in a way that positively influences consumer behavior and public perception.

Engagement that leads to a change in consumer behavior rests squarely on education and communication to build superior trust in sustainable brands. Companies earn this trust through transparent business processes, optimized supply chains, and thoughtful and responsible asset management. By using technology to capture and share information with consumers, companies can influence customer behavior while simultaneously nurturing lifetime relationships that result in sustainable profits.

Leading companies don't stop with customer engagement. They also participate in, or lead, industry associations, engage with their supply chains, and even take political action. The rise of precompetitive organizations and technology-enabled platforms where businesses can come together to learn from each other and innovate — such as the global Sustainable Apparel Coalition, the UK's Innovation Gateway, and Schneider Electric's New Energy Opportunities (NEO) Network™ — indicates the need for industry leaders to collaborate to solve today's pressing challenges.



Corporate sustainability builds brands

Today organizations are seeking opportunities to improve margins while leveraging corporate sustainability to build their brand.

Consumers want to know more about the brands they buy, and shareholders expect more transparency regarding product, social, environmental, and operational sustainability. Strategies for leveraging sustainability to achieve P&L improvement goals include public reporting on progress toward sustainability targets, improved efficiency of facilities, investments in renewable energy, improved product lifecycles, and active management of the sustainability of their supply chains to ensure a lower impact on the environment.

According to a PwC survey, being more environmentally, socially and economically responsible was fundamentally core to the business strategy of three quarters (77%) of organizations responding. In fact, 76% agreed that placing efforts to be more environmentally, socially and economically responsible at the heart of their business strategy will drive innovation and provide long-term financial stability, while 74% believed it will provide them with a market advantage, alongside mitigating climate change.¹⁴

Trend 4: The 3 Ds + E — digitization, decentralization, decarbonization, and electrification

Widespread digitization and the increased need and desire for electrification are causing significant upheavals in traditional ways of doing business, such as the advent of the sharing economy. This disruption is driving further decentralization of business operations and placing increased responsibility and autonomy into the hands of workers and technology. These trends are only expected to increase as world resource markets undergo seismic shifts — such as the arrival of autonomous electric vehicles, rapid advances in clean technologies like battery storage, and the need to contend with the risks posed by climate change, including business continuity disruption and natural resource depletion.

Digitization, specifically, has been driven by breakthroughs in technology and automation. Today, digital sensors are embedded in what was once regarded as “dumb” equipment, enabling them to gather data previously unavailable. Advanced analysis of the data provides valuable clues into how production assets are being utilized, how much energy they are consuming, when assets are reaching the end of their useful life, and when an adjustment in the field must be performed to better match output to demand. The connectedness of devices allows anything from a variable speed drive to a smartphone to become a source of data that can drive future performance and behavior.

Investing in digitization is one of the key factors in converting business processes from reactive to proactive — and it virtually guarantees a positive return.





Investing in digitization is one of the key factors in converting business processes from reactive to proactive — and it virtually guarantees a positive return. According to a recently released Schneider Electric report, decision makers began to see noticeable rates of return within the first 12 months of implementing new technology, and 75% of those surveyed expected to have the ability to intelligently connect people, processes, and data through devices and sensors within one year.¹⁵

Digitization is also core to a company's sustainability performance. It has begun to change the way companies think about products, technologies, and systems, enabling more sustainable business models. By replacing manual processes with software, digitization allows businesses to automatically collect data that can be mined to better understand performance, cost drivers, and the basis for risk.

Industry leaders who actively pursue digital connectivity and data to bolster their sustainability efforts can succeed in transforming their organizations. These new technologies help companies move beyond reactivity to resiliency by leveraging

Global energy demand is expected to expand by a factor of 1.5 over the next 40 years, driven by increased digitization, urbanization, and industrialization.

sustainability to drive business growth. By gathering and analyzing data in a “sense and respond” manner, digital technologies allow for ever more precise control of how resources such as energy and water can be conserved.

However, digitization also presents a sustainability challenge for business, specifically, how to manage the energy demand it creates. The electrification of the world is the predominant catalyst for the anticipated 80% increase in electricity consumption over the next several decades. Global energy demand is expected to expand by a factor of 1.5 over the next 40 years, driven by increased digitization, urbanization, and industrialization. It is estimated that industrial energy use alone will increase at least 50% over the next 35 years.¹⁶

How commercial industry is using technology to meet sustainability challenges

There is growing and rapid adoption of technology, and digitization specifically, across global industries as companies recognize the power of IoT to drive both cost and resource reductions. This adoption is already beginning to change consumer behavior and will only accelerate. Several of these leading industries are highlighted below.

Hotels and hospitality

Hotel guests are not directly accountable for a hotel's overall utility bill. This means that room occupants have little incentive to adopt energy efficient habits. Guest room energy consumption accounts for between 40% and 80% of energy use within the hospitality industry,¹⁷ yet in most hotels, rented rooms are unoccupied 60% to 65% of the time during the day.¹⁸ But hotels face a unique challenge: temperature control within a room must be balanced for the comfort of the guests regardless of the time of day or occupancy rate. A guest never expects to walk into a room that is too hot or too cold.

Now imagine a hotel where energy consumption in rooms is precisely monitored and guest comfort maintained but energy conserved. New generations of sensors located within rooms gather an abundance of comfort, safety, and energy consumption data on an ongoing basis. That data is forwarded via network to building analytics software which then converts it into actionable intelligence. The result: improved energy efficiency performance of the building, reduced



emissions, and higher guest satisfaction. This is digitization at work.

Beyond the minute-by-minute adjustments to environmental conditions possible within guest rooms, the intelligence built into the system also identifies potential longer-term problems. Once a potential issue is identified — for example, a fan within the ventilation system that is under-performing — the system offers suggested actions to address the situation. This type of automated fault detection and diagnostic data is stored in the cloud and analyzed by qualified experts, allowing hotels to proactively identify equipment and system faults, prioritize the sequence of operational improvements, and gather energy usage trends over time, allowing hotels to meet long-term resource reduction goals.

Manufacturing

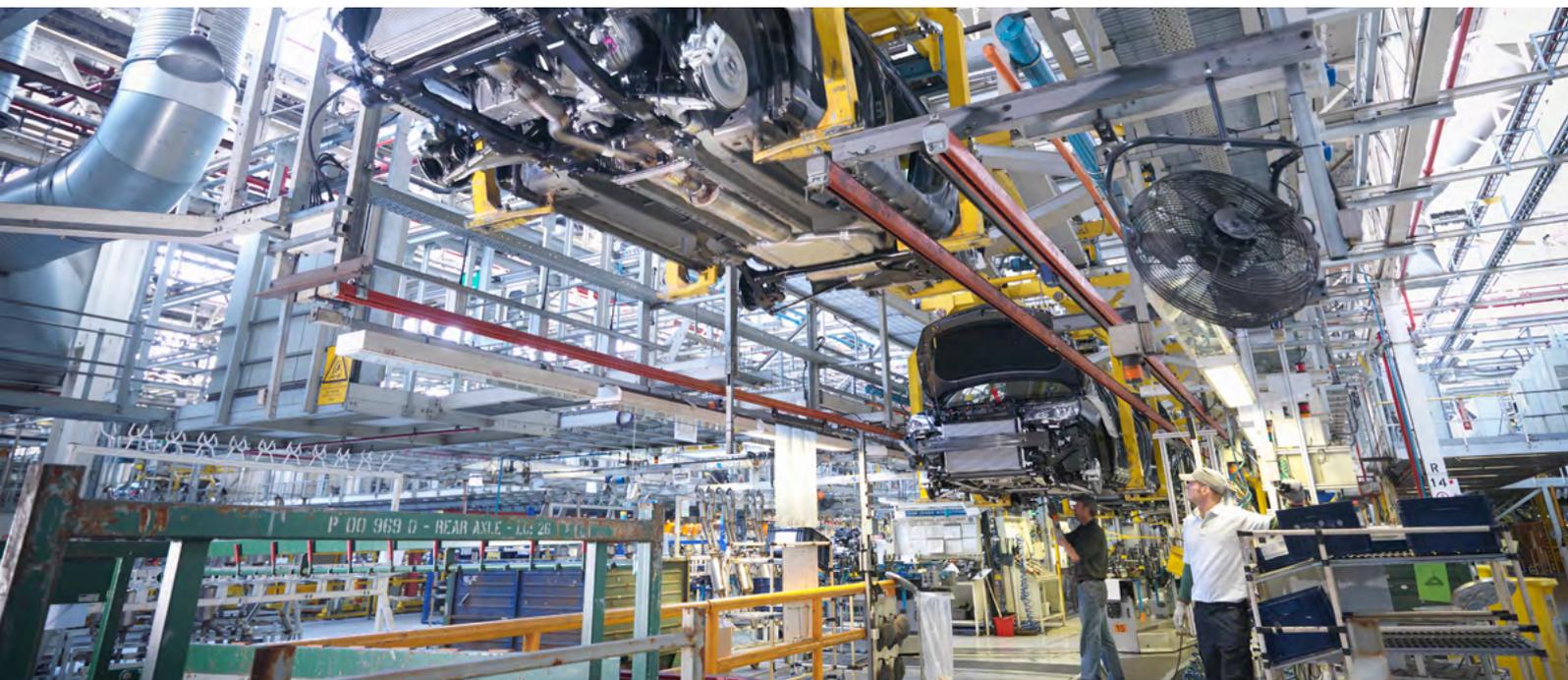
An industrial environment is affected by digitization in a different way, but like hospitality, the implementation of smart, connected sensors in manufacturing is key to productivity, performance, efficiency, and resource management.

Sensors deployed on factory floors used to be overly complicated and included too many functions in one package, limiting their capabilities and volumes of measurement. The new generation of sensors is simpler, smaller, and connected. These sensors measure and pass along the raw data within the smart assets of a cyber-physical system. Unencumbered by the tasks of conditioning or interpreting the data — which takes place at the analysis level — sensors have only one job: measure. Industrial sensors are evolving to track single performance tasks, where each unique sensor differs from another only by the configuration of the same set of raw materials, which allows sensors to be recycled and reconfigured as a new unique sensor — the ultimate in modularity and sustainability. This capability is only possible because of the simplicity of the design of this technology.

The result of smart sensing is intelligent manufacturing: self-organizing machines and assets that enable mass customization and enhanced sustainability through the wireless collection, connection, analysis, and control of the data from thousands or even millions of simple, distributed sensors. By driving simplicity to the fundamental components (measurement), driving differentiating complexity to interpretation (control), and linking them

Global compatibility for long-term success

Semyx, an OEM that designs large, customized waterjet cutting machines for companies around the world, wanted to upgrade its product line while also maintaining compliance with global standards. By carefully selecting a wireless pendant remote for its operations from another global manufacturer, Semyx achieved a 50%–75% improvement in productivity. At the same time, Semyx could assure its customers worldwide support, further enhancing the sustainable nature of their purchase.¹⁹



(connectivity), there is now a directional shift in the Industrial Automation and Control model—one that can be defined as “simply complex,” where simple measurements plus complex interpretation equates to customer value and sustainable production.

In clean-in-place operations, for example, recent smart sensor technologies now enable plant operators to calculate the optimal mix of natural resources, temperatures, and flows required to achieve production and safety standards while saving at least 20% in energy cost and reducing the downtime for operational cleaning by at least 20%.²⁰ In addition, all the steps in the process can be easily traced and automatically documented, which simplifies any auditing requirements that need to be performed by regulatory inspectors.



Edge devices enable legacy assets to interface with newer automation or enterprise architectures.

This is not to say that older installed technology is automatically becoming obsolete. A growing number of edge devices that collect, aggregate, and filter data close to individual process or production assets are expanding the frontiers of intelligent manufacturing. Beyond running local analytics to detect process variations in real time, these devices increasingly act as intelligent gateways on the edge of industrial networks, bridging the gap between the informational and operational environments. In doing this, edge devices enable legacy assets — sensors, controllers, and other devices — to interface with newer automation or enterprise architectures.

Data centers

As mentioned in the previous example, the “big data” generated by this new generation of intelligent, connected devices is converted into useful information that heavily influences both business decisions and natural resource consumption. For the most part, this information is processed by a combination of software and hardware that resides in a data center.

Data centers also support a large population of server and smart devices themselves that require precise environmental conditions that result in high energy consumption. Energy use is a substantial cost of data center operations, in some cases exceeding the cost of the IT hardware. It’s unsurprising, as a result, that global data center companies such as Equinix, Amazon Web Services, and Digital Realty have been among the earliest adopters of utility-scale renewable energy to reduce the cost and environmental impact of managing their digital real estate.

Cost pressures, and the realization that data centers can be much more efficient in their use of energy, have also influenced many cloud operators to reduce their energy consumption through smart technologies.

Earlier infrastructure management systems generated pre-loaded lists of devices and warned that a cooling unit inlet temperature had exceeded an established threshold. The operator would have to determine on his or her own what equipment was affected by the error. The tools were not capable of generating a correlation between physical infrastructure device and server. Nor were these tools capable of initiating actions to prevent downtime, such as speeding up fans to dissipate a hot spot.

Newer smart tools are designed to identify and resolve these issues with a minimum amount of human intervention. By correlating power, cooling, and space resources to individual servers, these tools can proactively inform IT management systems of potential physical infrastructure problems and how they might impact specific IT loads.

Particularly in a highly virtualized and dynamic cloud environment, this real-time awareness of constantly changing power and cooling capacities it is important

Improving data center performance

A new high-efficiency green data center for the Director General of Highways in Taiwan was facing high energy consumption, challenging uptime demands, and low system scalability. Incorporating IoT sensors and control software resulted in a much more sustainable installation. The data center improvements are yielding annual savings of 1 million euros, which translates to a 36% reduction in energy use. In addition to reduced energy costs, the center has higher reliability, provides opportunities for business analytics and optimization, and now has flexibility for growth.²¹

for safe server placement. These more intelligent tools also enable IT to inform cloud customers of the consequences of their actions before server provisioning decisions are made. Business decisions that result in higher data center energy consumption, for example, will impact the cost to do business as well as the data centers' carbon footprint. Charge backs for energy consumption are also possible with these new tools and can alter the way decisions are made by aligning energy usage to business outcomes.



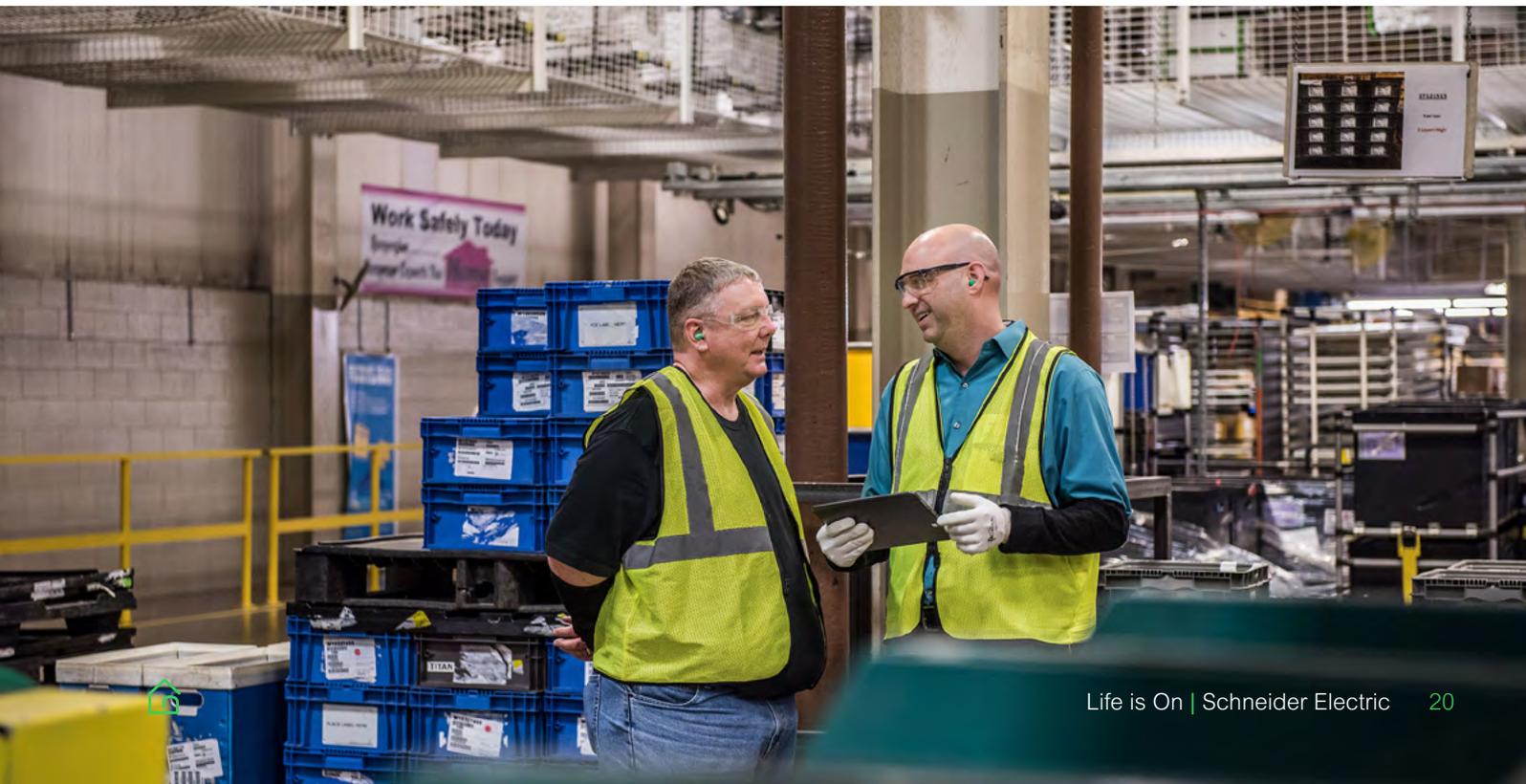
The opportunity: How technology helps business respond to sustainability megatrends

The four megatrends described offer businesses the chance to leverage ongoing technological advancements — especially digitization — in four key areas directly tied to sustainability performance:

- *More efficient resource utilization and the corresponding positive impact on P&L:* As older systems are upgraded and newer, smarter systems are installed, customers save money based on increased operational efficiencies, improved digitization and data collection, and decreased manufacturing and supply chain waste. It is estimated that businesses that reduce energy consumption by 30% to 40% could realize a 10% reduction in their overall operating costs.²² By using Schneider Electric's Resource Advisor, Whirlpool Corporation identified that its corrugated cardboard

from a single plant was a significant source of waste. As a result of this new awareness, the company anticipates saving more than a million dollars over the next three years.²³

- *Improved return on assets and business resiliency through increased circularity:* As new, more sustainable systems are put into place — whether as upgrades, replacements, or new systems — customers share in the benefits of assuming long-term responsibility for such equipment, through greater participation in the circular economy. Such a change to a regenerative, circular approach to business has the potential to grow resource productivity by up to 3% annually while increasing traceability inside business processes, enabling the most effective use of resources real-time.²⁴





- *Enhanced health and safety:* Manufacturers design all new products to meet the strictest health and safety requirements as a matter of course. But savvy manufacturers continually flip the regulatory burden, turning it into a catalyst for change. By implementing technology into existing product lines to improve the sustainability of products, companies protect human lives and health and gain powerful marketing differentiation.
- *Risk mitigation and an increased level of public trust:* Over time, every company builds a reputation. Customers value a company's transparent business processes and optimized supply chain sustainability and asset management. The resulting superior trust provides one more significant competitive advantage, especially in industries related to critical services, life safety, and consumer goods. Unethical or opaque business practices are increasingly scrutinized, and the impacts can be severe — witness the billions of dollars in fines, criminal censure, and loss of market share that recently resulted from the manipulation of emission controls and test results in the auto industry.

The trends toward decoupling economic growth from environmental pressure, evolving disclosure requirements, consumer engagement, and disruption and decentralization present businesses with prime opportunities for increased economic, social, and environmental performance. The adoption of smart technologies and digitization are driving efficient resource utilization, improved P&L performance, business resilience, and value for companies and consumers. Companies that hesitate to invest in technology-enabled sustainability risk being left behind as leading organizations fully embrace the need to work differently for the long-term success of the planet and profitability.

A circular approach to business has the potential to grow resource productivity by up to 3% annually.

Endnotes

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02

Living with finite resources



Chapter 2 – LIVING WITH FINITE RESOURCES: Strategies for sustainable resource utilization

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30 Using renewable energy and clean technologies to drive resource reductions

33 Water: The next resource frontier





Introduction

The Earth's resources are finite, making the importance of developing sustainable ways to operate increasingly urgent.

It can be challenging for businesses to think long-term, but today's economic, social, and environmental opportunities and obstacles require it. Companies are now being confronted with the stark reality that they are operating on a planet with finite resources. Continuing to operate in this reality requires creativity and innovation, and leading companies are rising to the challenge by looking at how to manage natural resources differently, how to measure them more accurately, and how to develop products and processes that use them more efficiently. This new type of business thinking will ensure sustained growth that balances productivity and profitability with the planet and its people.

Growing interest in a circular economy — where products and services are designed for maximum resource utility, upstream and downstream longevity, and responsible end of life regeneration — is being driven by technology and innovation. Leading companies are already using digitization to enable smart manufacturing, which reduces natural resource consumption. Increasingly, product materials are being reimaged and developed using biomimicry, or reclaimed for reuse at end of life. Companies are taking leading positions on renewable energy buying, energy storage, and water and waste reduction solutions. The transition to circular design, everything-as-a-service business models, and reverse logistics are creating a path of systemic change toward a more sustainable world.

The increasingly favorable economics of responsibility are helping to drive this change. For decades, “green” solutions came with a high price tag. The tide is turning, however, and today, the direct costs of being green are frequently no greater than — or even substantially less — than non-green alternatives. Consider the cost of renewable energy, which has fallen dramatically in the past decade thanks to technological advancements, making solar power the least expensive form of energy in over 60 developing countries.¹

The business value of sustainability

According to a report from McKinsey, investments in businesses with sustainability strategies perform generally better than in those without.

“An investment of \$1 in 1993 in a value-weighted portfolio of high-sustainability companies would have grown to \$22.60 by the end of 2010, compared to just \$15.40 for a portfolio of low-sustainability companies,” according to the authors of the report.

Those high-sustainability companies also realized better return on assets (34%) and return on equity (16%).²





Indeed, the cost of inaction is driving many companies in industries ranging from manufacturing to mining to consider the value of a responsible approach to business. Without direct action in alignment with the science behind the 2015 Paris Climate Agreement, the planet is facing a 4 to 5 degree Celsius rise in global temperatures by 2100.³ While the impact of this steady temperature rise may have little effect on companies today, leading organizations are recognizing that the ability to do business-as-usual in the long term will be futile without accounting for the full costs and externalities of a company's actions.

Today, thousands of companies consider the impact of their environmental footprint and resource availability when planning. A recent poll of Schneider Electric clients in Europe revealed that 82% consider resource scarcity and sustainability as key elements in their decision-making processes.⁴

Sensitivity to resource utilization — and the resulting impacts — have become most keen for companies as it relates to their energy use. Worldwide, industry is the largest consumer of energy, and therefore also the largest polluter. Increasing attention has been paid to the role that business can play in keeping the effect of emissions below 2 degrees Celsius. This section explores the concept of corporate carbon accountability. It explains how leading companies are using solutions like utility-scale renewable energy and clean technologies to set and meet aggressive carbon reduction targets in line with leading climate science. It also describes how progressive companies are addressing other natural resource constraints, such as water.

The cost of inaction is driving many companies to consider the value of a responsible approach to business.

Corporate carbon accountability

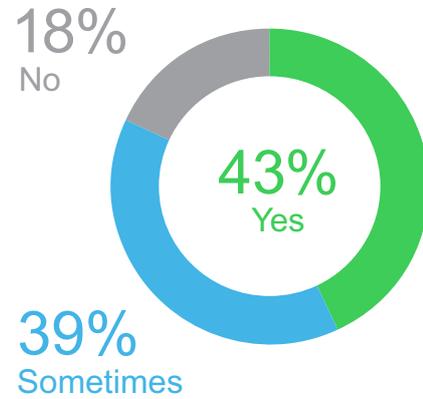
Recent pressure and scrutiny have focused on how companies, as the world's largest emitters, can take greater accountability for their role in creating — and more importantly, reducing — global warming. Carbon pricing, carbon reporting and disclosure, science-based targets, and efficiency programs are all mechanisms that businesses are using to address, and ideally reduce, their carbon footprint.

Carbon Pricing

Carbon pricing is an accounting system that places an economic incentive on emission reductions. Two common forms of carbon pricing are emissions trading systems and carbon taxes.

In recent years, numerous governments have introduced pollution taxes aimed at bolstering sustainability by reducing emissions, and these have typically impacted businesses. For example, energy was relatively cheap in the latter part of the 20th century and even large users viewed energy costs as simply part of the cost of doing business. However, reducing energy use quickly became a goal for many UK companies in 2001 when the government initiated a climate change levy on energy supplied to businesses. The specific goal of this tax was to help the country meet its emission reduction commitments that had come from the Kyoto protocol. Accordingly, higher taxes were levied on higher polluting fuels and dropped to zero for energy from renewable sources.⁵

These so-called carbon taxes have helped to spur corporate momentum on measuring and managing energy use to avoid taxation — or, in some cases from non-governmental organizations (NGOs) scrutiny and pressure. The result has been innovation in technology, as manufacturers have responded to the demand for switching and distribution equipment with usage-tracking capabilities, and an exponential increase in the number of companies annually disclosing their carbon emissions.



Do you consider resources scarcity or sustainability when evaluating projects?

Figure 1 - Source: Schneider Electric, "Perspectives Conference in Berlin Presentation," 2017



According to the World Bank, when governments adopt some form of carbon pricing “they begin to capture what are known as the external costs of carbon emissions – costs that the public pays for in other ways, such as damage to crops and health care costs from heat waves and droughts or to property from flooding and sea level rise – and tie them to their sources through a price on carbon.”⁶

Today, 47 carbon pricing initiatives have been implemented or are scheduled for implementation around the world. Valued at \$52.2 billion, they cover 14.6% of global greenhouse gas emissions.⁷

Carbon Reporting & Disclosure

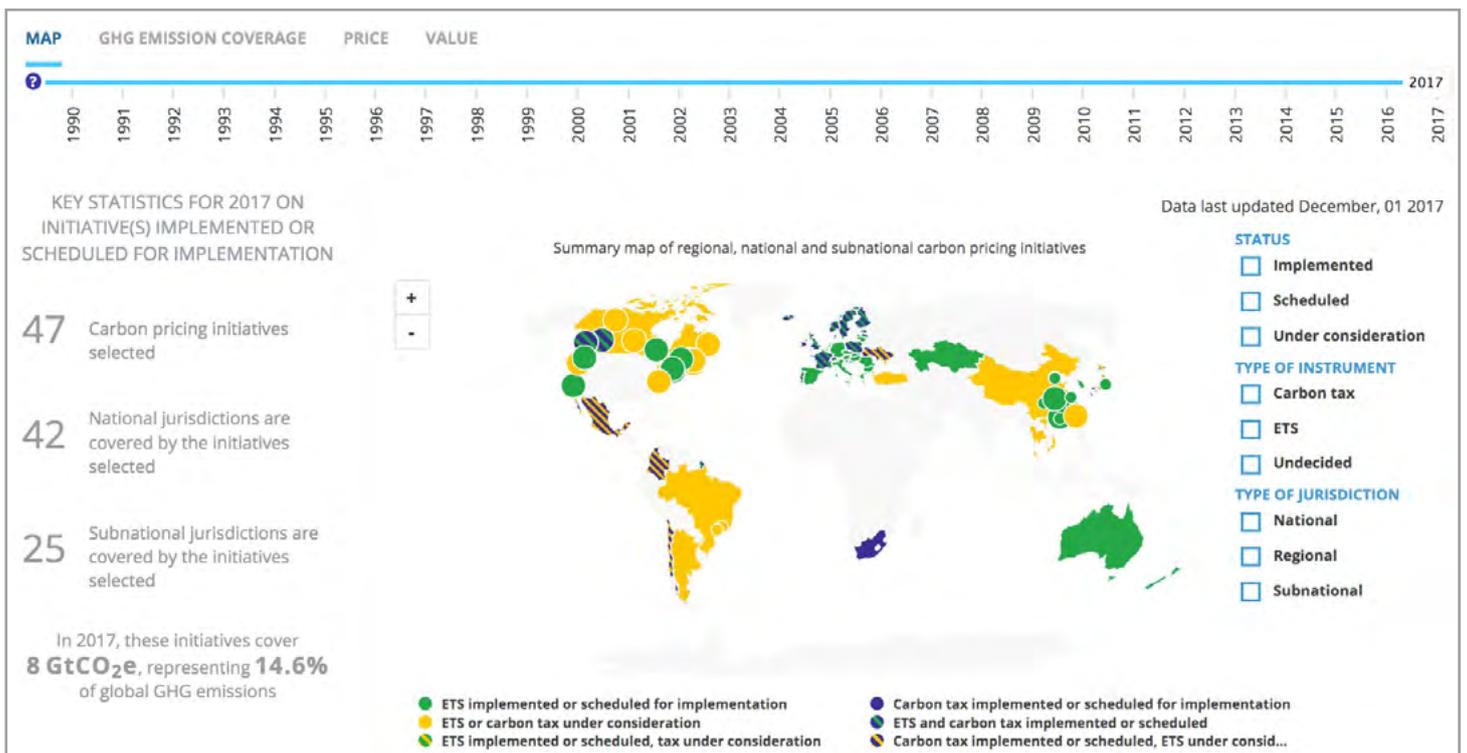
Annually, over 5,000 global companies report their carbon emissions to CDP, the world’s largest repository of voluntary emission data. CDP acts on behalf of investors to manage trillions of dollars in long-term investments based on the environmental performance of participating companies over time. The impacts

of climate change, driven by unchecked greenhouse gas emissions, represent a real threat to investors and business continuity. Through its annual corporate and supply chain reporting and disclosure program, CDP ensures that emission reductions are an integrated part of business strategy. Companies can use the CDP reporting process, and the feedback provided by CDP, to continue to advance their carbon reduction efforts.

Science Based Targets

While companies have been setting carbon reduction targets for more than a decade, these targets were typically only based on organizational aspiration, and not climate science. The growing understanding that deep reductions in emissions will be necessary to avoid the worst impacts of climate change has led an increasing number of organizations to set targets based on science through the Science Based Targets initiative (SBTI), a non-profit organization that helps companies target and achieve emission

Figure 2 - Summary map of regional, national and subnational carbon pricing initiatives. (Source: carbonpricingdashboard.worldbank.org/map_data)





By using technology to drive efficiency, companies realize increased operational effectiveness and reduce manufacturing and supply chain waste.

reductions. More than 350 global organizations have joined SBTi, with an average of two new companies joining every day.⁸

Efficiency Programs

As carbon pricing and disclosure in its various forms relies on self-reported data, it is more important than ever for businesses to know and understand how they are using energy, and how they can reduce that utilization. Technology plays a critical role in helping to identify the data responsible for driving these streams, and the digitization of electrical supply and distribution systems is making this possible. Some examples are:

- **Wide area networks.** These networks link a variety of smart devices distributed throughout electrical distribution networks, providing communications and security infrastructure as well as enabling users to track energy consumption.
- **Advanced metering infrastructure.** This new generation of meters is improving the accuracy of collecting energy usage information while providing a mechanism to both inform and empower utility customers as they choose better energy consumption patterns.
- **Meter data management systems.** This software focuses on properly managing and integrating all meter-generated data: historical data for analysis, as well as billing, power quality, and system events data. This integration tool is the hub that shares data with other critical applications such as customer information systems (CIS), and customer relationship management (CRM) systems.

Newer equipment has built-in communication capabilities that enable remote data collection and, frequently, system control as well. But what about the vast installed base of electrical distribution systems that predate this higher technology?

Leading suppliers have addressed this hurdle by developing retrofit and upgrade solutions that bring new monitoring and

A shining example of efficiency in action

The Earth Rangers Centre for Sustainable Technology is a prime example of how effective monitoring and control systems can be in reducing the demand for energy and other resources. Located just outside Toronto, Canada, the Earth Rangers facility is the headquarters for this conservation organization for kids.

Schneider Electric partnered with Earth Rangers to provide building automation, metering, security, and lighting controls for the organization's new facility, which earned LEED® Gold certification for new construction. Earth Rangers soon decided to go even further in providing an environmental showcase by making additional reductions in energy use and carbon emissions, in pursuit of a LEED Platinum for Existing Buildings certification.

Implementing an advanced energy management system that leverages existing real-time monitoring and control systems allowed facility operators to monitor actionable energy information. This includes data from the facility's 80 subsystems and energy loads, including solar panels, an onsite water treatment facility, and earth tubes for geothermal heating and cooling. The information is presented in a single "facility scorecard" that is easily understandable to building operators, managers, and the general public.

Earth Rangers achieved an additional 20% energy savings and earned the LEED Platinum for Existing Buildings certification. Today, the facility is 90% more efficient than the base design of the model National Energy Code for Buildings.⁹

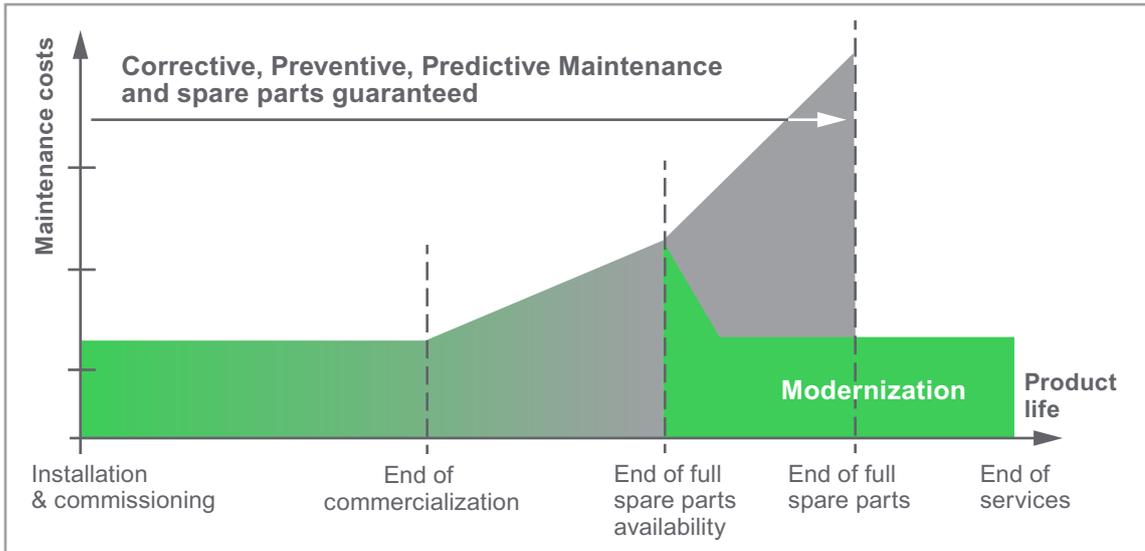


Figure 3 - Strategic partial or complete replacement of old equipment with new equipment extends electrical equipment's useful life and enhances availability and operational reliability. (Source: Schneider Electric, 2017)

control capabilities to older equipment that is otherwise still fit for service. This is critical, as switchgear typically has an expected service life of about 25 years.

The integration of vintage equipment into newer distribution networks can be achieved through programs that offer component-level upgrades for older switchgear. Replacing only what is necessary to upgrade specific functionalities while retaining the basic, installed equipment reduces waste, minimizes downtime, and provides significant life extension, saving as much as 95% of the cost of total replacement.¹⁰

By using technology to drive efficiency, companies realize increased operational effectiveness and reduce manufacturing and supply chain waste, which has a positive impact on both the bottom line and the company's overall environmental footprint, in addition to energy savings.

Technology like Schneider Electric's EcoStruxure™ Resource Advisor can also be used to help drive carbon reductions and efficiency improvements at an enterprise level. By providing companies with clear insight into the performance of their operations over time, goal setting and achievement are bolstered, and tracking of the impact of efficiency measures obtained.

A recent study published by GreenBiz and Schneider Electric found that 79% of companies have sustainability data collection projects underway, but that only 55% of those surveyed indicate that they have the right connected devices and software in place to act on energy and carbon savings opportunities when identified.¹¹ Clearly there continues to be room for companies to improve not only their technology, but the actions resulting from the data sourced from that technology.

Worldwide energy use assessment and control

Entertainment and sporting venue operator AEG has facilities on five continents, including 22 of the world's top 100 arenas, and energy makes up its second largest operating expense. In 2007, AEG engaged Schneider Electric to perform a comprehensive assessment of its operational efficiencies and environmental impact. Using Schneider Electric's Resource Advisor to compile, consolidate, and display energy use data enables AEG to track 53 different types of data streams. This information allows AEG to reduce costs and environmental impact, in part by facilitating the purchase of renewable green power for its facilities and the site-level implementation of distributed energy resources.

In addition to boosting the company's sustainability, these resource efficiency measures are also smart business decisions. Since 2010, AEG has saved more than \$3 million through Schneider Electric's energy procurement program.¹²

Using renewable energy and clean technologies to drive resource reductions

Perhaps the biggest shift in corporate resource management in recent years is the global pursuit of renewable energy, and, increasingly, other clean technologies. Driven by a rapidly falling price and clean power's zero carbon claims, companies are snatching up wind, solar, and geothermal power at record rates. According to recent Schneider Electric and GreenBiz research, 52% of companies responding to the survey reported renewable energy projects in process.¹³

In addition to the economic advantages now available with renewable energy, using clean power to diversify a company's energy supply portfolio also builds resilience against disruption. It offers customers more ways to manage and control costs, including greater opportunities for active energy management, facilitated by expanded digitization and connectivity.

There are typically four ways that companies can utilize renewable power. These methods differ depending on geographic location, but markets continue to open at rapid rates to meet growing global demand.

- **Energy attribute certificates (EACs).** Long considered the gold standard in renewable energy procurement, EACs are the certificates of origin for renewable power worldwide. They represent the environmental attributes of clean generation and may be traded in both voluntary and compliance markets. Although EACs do not typically convey material leadership for renewable power projects, these commodities underpin every renewable power trading market and provide a critical demand signal to these markets for the growth of renewable energy.

Data Centers: Going all in for renewable energy

Many companies are now greening their energy and investigating on- and off-site renewable energy solutions. One example is Equinix, a global leader in interconnectivity, where Schneider Electric is helping the company achieve its goal of 100% renewable energy. The company buys energy strategically with utility audits and analysis for error resolution. Using PPAs has enabled Equinix to boost its use of renewables to 100% for North America and 82% of its global needs. This also resulted in a \$23.2 million cost savings.¹⁴



- **Offsite Power Purchase Agreements (PPAs).** Once relegated to the domain of utilities and governments, PPAs are now in common use by corporations. These contracts allow companies to work directly with project developers, in some cases bypassing centralized power distribution and transmission structures. The benefit to companies is a low, fixed price for power that may allow them to hedge against volatile energy fluctuations. The deals are complicated, however, and contain many risks that must be managed, so it is critical for any company considering a PPA to work with an energy buyer advisor like Schneider Electric's Energy & Sustainability Services.
- **Onsite, distributed generation.** While offsite PPAs are generally large-scale, they can be inflexible, and typically require the corporate buyer to demonstrate creditworthiness. Companies that need a smaller amount of renewable power, or who have rooftop real estate — such as a retailer — may be a good candidate for onsite, distributed generation, which typically takes the form of solar power. Onsite systems can be configured to meet the needs of the buyer, through a variety of contracting structures and both ground-mounted and rooftop panels. However, since these systems typically do not exceed a few megawatts (MW), most large companies will need to diversify with offsite PPAs and/or EACs.
- **Green tariffs.** Green tariff programs — which are common in Europe and growing in popularity in North America and elsewhere — allow companies to buy renewable power from their utility provider through a variety of different contracting mechanisms including tariffs, riders, and subscription programs. In all cases, the utility passes the benefits of renewable power purchasing along to its customers by matching the electricity purchased by the customer with renewable power.

It's important to realize that not all renewable power options are available in every geography and that restrictions such as regulation may inhibit companies from using renewables across the entirety of their load or carbon footprint. Global markets for offsite PPAs, for instance, include the U.S., Mexico, some countries in Europe, Australia, and India.

It's also critical to acknowledge that renewable power presents one of the clearest paths forward for companies seeking to consume energy responsibly and reduce their carbon footprints. Approximately half of global carbon reductions could be achieved with renewable energy,¹⁵ with the International Energy Agency forecasting continued strong global growth through 2022.¹⁶ Corporations have already been responsible for the addition of more than 12 gigawatts (GW) of new renewable power to the global grid, dominated by explosive growth in the American market, thanks to the U.S. wind power Production Tax Credit (PTC) and Solar Investment Tax Credit (ITC).



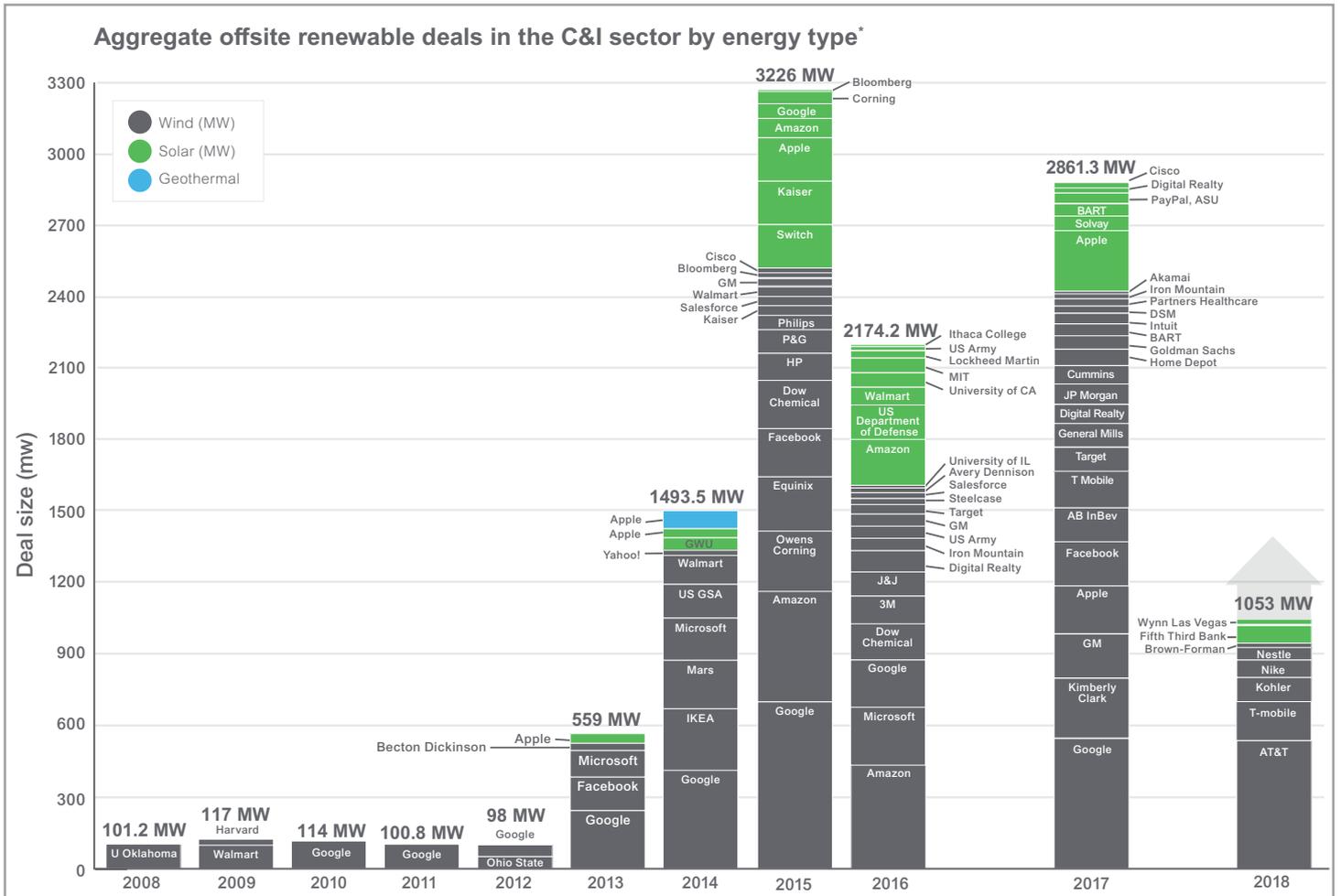
Once dominated by large tech companies, as shown in Figure 4, renewable power buying is now occurring across all industries. Consider:

- Target Corporation — one of the largest retailers in the U.S. — recently signed a long-term contract for 100 MW of new electricity generation capacity from a wind farm in Kansas, enough energy to meet the average power needs of 150 stores.¹⁷
- U.S.-based engine and generator system manufacturer Cummins, Inc. recently entered a 75 MW PPA to support the Meadow Lake Wind Farm in Indiana.¹⁸
- Philips¹⁹ and Microsoft²⁰ are among the global corporations who have executed PPAs in the U.S. as well as in Europe, one of the fastest growing corporate PPA markets.

- In 2017, Telstra became the first corporation to execute a renewable energy PPA in Australia.²¹

Renewable energy isn't the only way that companies are exploring clean technologies. Biofuels, fuel cell technology, battery storage, electric vehicles, microgrids, and other innovative solutions are also on the rise, thanks in part to declining prices and virtual tools like Blockchain.²² Data center operator Equinix purchased 37 MW of fuel cells for its North American operations in 2017, and Montgomery County, Maryland — one of the largest U.S. purchasers of renewable power EACs — recently embarked on a project to install two advanced microgrids.²³

Figure 4 - Schneider Electric Aggregated North American PPAs over the past decade (includes publicly announced deals from the U.S. and Mexico)



*Based on publicly announced C&I offsite renewable energy deals (financial, virtual, green tariff, tax equity, etc.) in the United States. Excludes onsite PPAs. Last updated 03.12.18.



Water: The next resource frontier

Companies are recognizing that responsible resource management must extend to water consumption and recycling, particularly those that rely on water to make their products. Coca-Cola, Kimberly-Clark, Starbucks, Proctor & Gamble, Gap Inc., and Nestle are among the global companies who understand the importance of water conservation and cleanliness, and over 2,000 companies reported their water data to CDP in 2017.

CDP has identified that water is a risk for almost every company in every industry sector, and water security affects over a billion people worldwide. The World Wildlife Fund (WWF) predicts that as much as two-thirds of the world's population may be impacted by water shortages as early as 2025.²⁴

Improving efficiency of water consumption, and ensuring its proper treatment post-production, are two key ways that organizations can make a difference. It is less recognized that using renewable power is another way companies can affect water scarcity, as both wind power and solar power require little to no water to generate electricity compared to fossil fuel or nuclear generation, both of which rely on enormous freshwater withdrawals for both heating and cooling.

Bottom Line

The responsible use of resources can positively impact a company's bottom line and reputation. It also ushers in a manageable way to address some of the greatest planetary challenges, including climate change and water scarcity.

New technologies and digitization can help companies be more efficient and less resource intensive, providing economic, environmental, and operational benefits.

The World Wildlife Fund predicts that as much as two-thirds of the world's population may be impacted by water shortages as early as 2025.



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Chapter 3 – LIVING BY PRINCIPLES: Business resiliency through increased circularity

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39 How the circular economy affects return on investment

43 A new basis for decision-making and risk avoidance



Introduction

Ensuring resources are deployed efficiently and maintaining systems and components at their highest levels of utility are well worth the time and effort to achieve sustainable growth.

The future viability and success of any enterprise depends on identifying and navigating risks. Accordingly, a company's long-term strategies and its short-term operational decisions must continue to reduce operating costs, improve efficiency, foster innovation, and nurture and preserve the company's reputation.

It's estimated that over \$1 trillion could be saved globally, each year, by 2025 with the adoption of circular economic practices.

One of those risks is resource scarcity. The World Business Council for Sustainable Development predicts that the total demand for resources will reach 130 billion tons by 2050, up significantly from the 50 billion ton level in 2014, an overuse of the Earth's total capacity by more than 400%.¹

In that context, it's easy to make the case for a circular economy. In a circular economic model, systems, procedures, facilities, and practices are created and managed in such a way that they can continue indefinitely, without exhausting the natural resources upon which they depend. Striving to ensure that resources are used as efficiently as possible, and ensuring that anything of value is put back into the larger cycle rather than being prematurely discarded, is logical on almost any level and in almost any time frame.

A recent report from the U.S. Green Building Council found that the current mode of global operation is in stark contrast with the reality of Earth's limited resources, as we consume resources 50% faster than they can be regenerated. They estimate that over \$1 trillion could be saved globally, each year, by 2025 with the adoption of circular economic practices.²

Moving to a circular economic model requires a tremendous shift in thinking, away from a sole focus on the financial implications of business to one that considers long-term sustainability. In this section, we'll explore the circular economic model in more depth, and its ramifications on business design for the future.

A new way of thinking, a new business model

In 2005, Ellen MacArthur set a new world record for the fastest solo nonstop sailing trip around the world. A singular-minded, passionate individual, her experience as a solo sailor inspired her understanding of what it means to live with finite resources. Out of that experience came her desire to shift the global economy away from a flawed operating system of consumption to one of regeneration of natural capital. Unlike a traditional linear economy, which relies on raw materials that are used and then discarded, MacArthur espouses a circular economy that mimics the complex systems of the environment that decouples growth from resource constraints, that is “restorative and regenerative by design.”³

MacArthur started the Foundation that bears her name in 2010. Today, hundreds of companies, innovators, universities, cities, and affiliates — including Schneider Electric — have joined the Foundation’s Circular Economy 100, which brings together stakeholders from across disciplines to develop collaborative solutions to pressing economic and resource constraints. The work of the Foundation draws on concepts such as the performance and sharing economies, biomimicry, and cradle-to-cradle design.

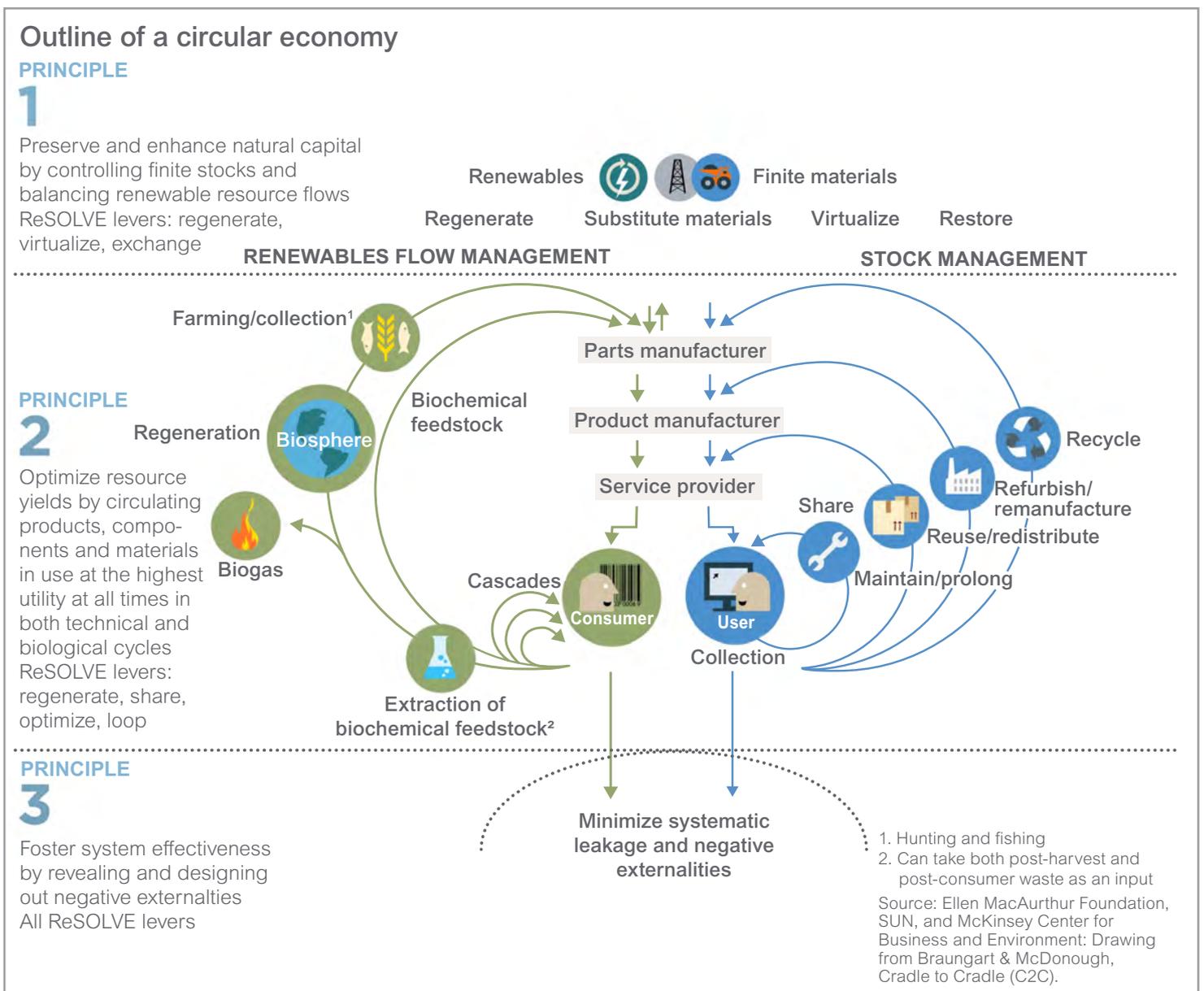
Achieving positive ROI remains important in a circular economic model, but it is joined by the imperative to use natural resources responsibly.



Achieving positive ROI remains important in a circular economic model, but it is joined by the imperative to use natural resources responsibly. This approach, as shown in Figure 1, makes an important distinction between renewable resources, such as wood, and those with a finite supply, such as minerals. It also distinguishes between biological and technical (nonbiological) materials, for which it advocates a 5 R approach — repair, reuse, refurbish, remanufacture, and recycle — that goes

beyond the traditional 3 R's (reduce, recycle and reuse) of linear economic thinking. Through this different way of looking at finite resources, the circular economy model seeks to always keep products, components, and materials at their highest utility and value and takes full advantage of every opportunity to eliminate waste.⁴

Figure 1 – Outline of a Circular Economy.
(Source: “Circular Economy System Diagram” from Ellen MacArthur Foundation.)



How the circular economy affects return on investment

Anyone concerned with getting their money's worth out of even a small investment knows that waste is to be avoided. But what happens when the definition of waste changes?

The European auto manufacturer Renault has been using remanufactured parts — reclaiming the value in what others might see as waste — since the middle of the 20th century. Today the Choisy-le-Roi facility's output has diversified to include injection pumps, gearboxes, injectors, and turbocompressors — remanufactured parts that are 30%-50% less expensive than newly manufactured parts. At the same time, the facility sends no material to landfills and uses far less resources in remanufacturing, compared to new production:

- 80% less energy
- 88% less water
- 92% less chemical products⁵

That's the kind of change that happens when companies and people start thinking in terms of a circular economy. Suddenly, an outdated electrical switchgear component is transformed from waste into raw material — a candidate for refurbishment, remanufacturing, or recycling. It is no longer just trash, but rather a source of raw material.

Determining how to move a business toward a circular economic model reaffirms existing efforts made to intentionally build operations that are friendly to the environment. In other cases, such introspection provides focus, direction, and encouragement for reinventing portions of the enterprise.⁶

Due to their scale, corporations are in a strong position to positively influence others to embrace more comprehensive product life-cycle sustainability best practices. By sharing methodologies for designing longer life products, capable of being refurbished or remanufactured



as needed, and by preserving the value inherent in waste materials, sustainability and return on investment (ROI) are enhanced. A focus on a circular economy model enables forward-thinking companies to present themselves as valued partners to like-minded organizations in building a sustainable future.

For example, Schneider Electric has taken numerous steps toward circularity that include:

- Implementing a system for recycling sulfur hexafluoride (SF₆) from equipment that has reached the end of its useful life, both protecting the atmosphere and ensuring an ongoing supply of this useful dielectric material.⁷
- Converting older manufacturing facilities into a central hub for repairing and refurbishing uninterruptible power supplies, which are prime candidates for periodic refurbishment.⁸
- Offering industrial repair services for many different brands of electrical distribution equipment dating back 40 years or more, extending this equipment’s useful life and reducing the risks associated with equipment failure.⁹

Similar efforts have paid off in other industries. Nike, for example, spent more than a decade investigating the environmental impact of its business across its value chain.

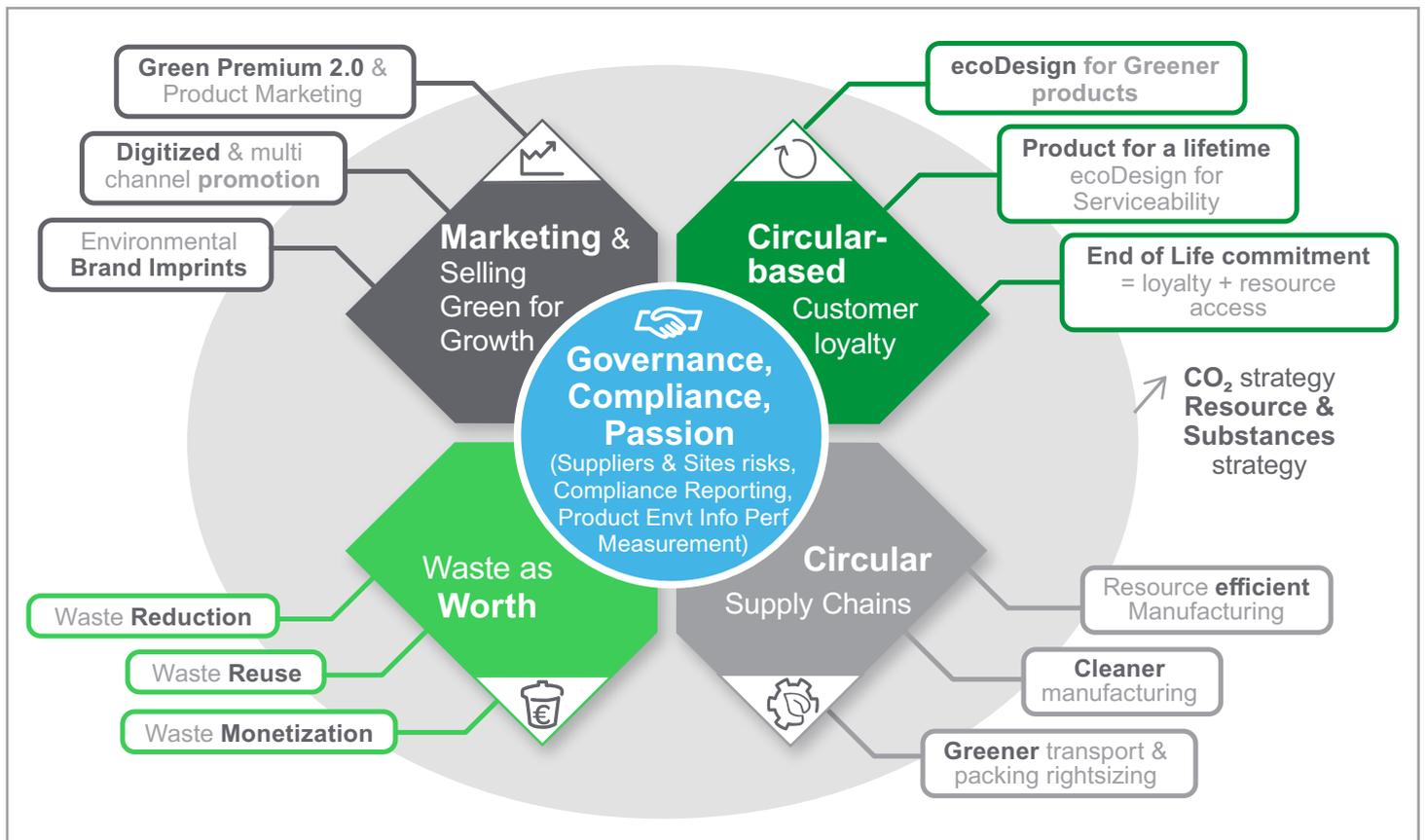


Figure 2 - Schneider Electric has made a corporate commitment to supporting the various aspects of a circular economy. (Source: Schneider Electric “Circular Innovations Presentation,” May 2017)

An early member of the Sustainable Apparel Coalition, the company has aggressively cut waste and its use of water, energy, and new materials by working toward a closed-loop ecosystem.

One initiative at Nike has been the transition to renewable energy sources, with the goal to achieve 100% in owned or operated facilities by fiscal year 2025. In addition, Nike Grind — the company’s palette of premium recycled materials — is today used in 71% of Nike footwear and apparel products, ranging from yarns and trims to soccer kits and basketball shoes.¹⁰

A key benefit to Nike is also the reduction in the company’s operational risk — the increase in the resilience of the enterprise — that comes from switching to renewable energy sources and recycled materials. These changes provide a hedge against rising prices and make the company less dependent on new raw materials, thereby reducing uncertainties about future availability and affordability.

Circular thinking also now frequently plays an important role in influencing the strategy of facility location. For instance, as the demand for data centers continues to grow, companies look for ways to reuse



Figure 3 – Source: Nike

existing infrastructure and capture and use waste heat. Some examples:

- A region of Scandinavia, once home to large mining operations, was recently chosen to be the home of a large, new data center. Although mining activities

Upgrading early saves resources (including money)

Many sustainability-conscious companies are initiating equipment replacements and upgrades much earlier, rather than waiting until systems or components reach their end of life. Why? To take advantage of decreased energy use and better ensure business continuity. For example, replacing older industrial motors can trim operating expense — which is to say, energy use — considerably. Newer equipment also comes with higher levels of support, and older equipment can responsibly refurbished or recycled following the tenets of a circular economy. Taken together, these aspects of proactive ongoing optimization grow increasingly attractive as an investment and a reliable way to reduce the likelihood of business interruption.

One example is Kingsly Compression. This leading supplier of small to medium horsepower natural gas compressors replaced motors/drives and controls ahead of schedule to obtain improved remote control, coincidentally achieving a 25% energy savings.¹¹

ceased years ago, the electrical generation and distribution infrastructure remained operational and in place, setting up a win-win scenario for the underutilized resource to supply the data center’s power needs.

- Some recent data center installations in Europe have been located to facilitate use of the heat collected from banks of servers. In one case, the data center was installed adjacent to a district heating facility that now uses the server-generated heat to supplement its own heat sources and supply process and residential heating throughout the area. In another case, a data center was purposefully located near a municipal swimming pool, where the heat from server operation supplies some of the energy needed to heat the water in the pool.

Technological advances in server temperature control have also improved the resiliency of data center facilities by reducing heat-related failure. This is achieved through a combination of improved universal power system efficiency, higher voltage power equipment, whole-facility cooling processes, and indirect air economizers that cut energy use by 92% on average.¹² Cumulative energy savings from all four improvements were utilized in a Dublin data center, increasing its Power Usage Effectiveness (PUE) by 82% and resulting in savings of \$345,766 per year.

Determining how to move a business toward a circular economic model reaffirms existing efforts made to intentionally build operations that are friendly to the environment.

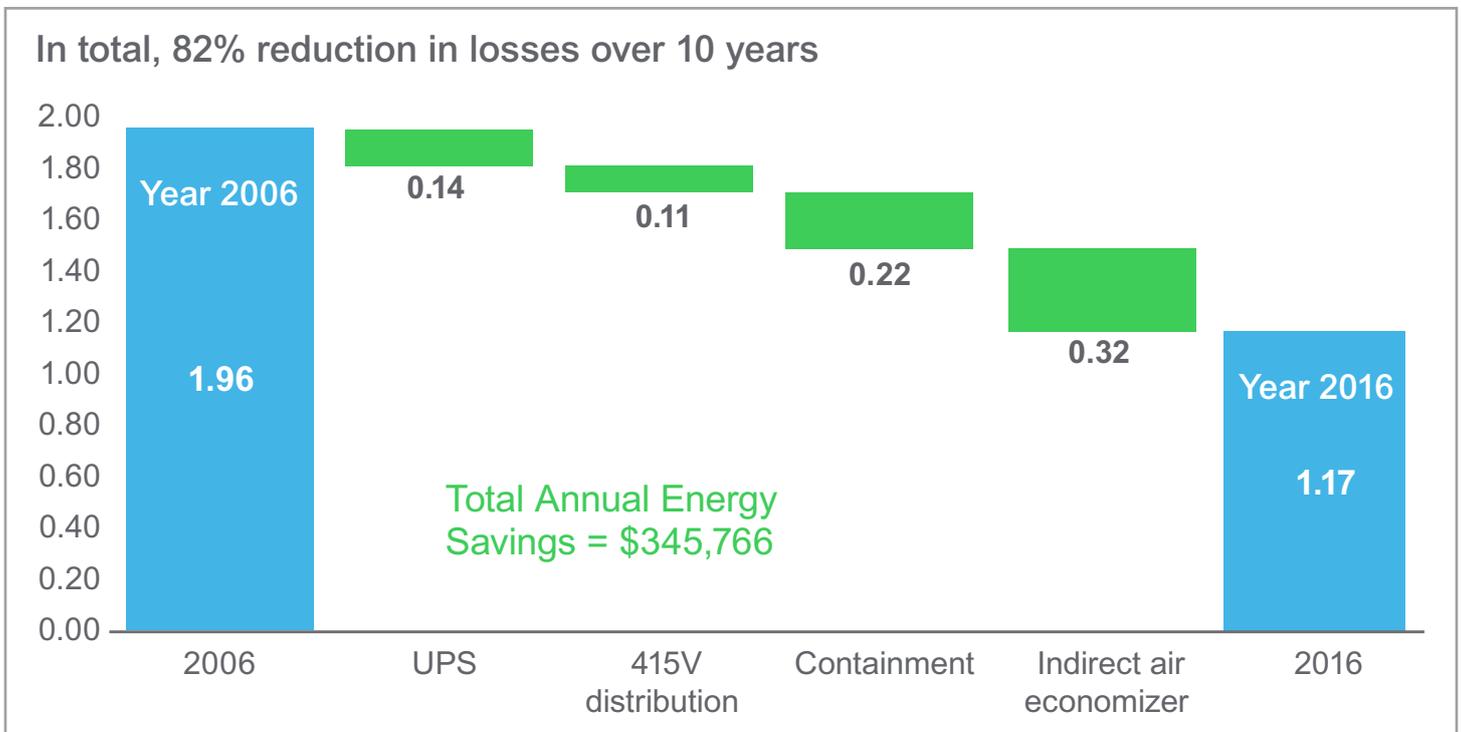


Figure 4 - The cumulative effect of improvements to Power Usage Effectiveness in data centers has gone from an average of 1.96 in 2006 to 1.17 2016, thanks to UPS improvements (-0.14 PUE), energy distribution improvements (-0.11 PUE), containment (-0.22 PUE), and indirect air economization (-0.32 PUE) (the last two are both related to cooling). (Source: Schneider Electric, Data Center Sustainability Then and Now Presentation," June 2016)

A new basis for decision-making and risk avoidance

When an enterprise adopts a circular economy point of view, it provides a new basis for decision-making and results in actions and policies that are both good for the planet and good for the company's bottom line. This point of view is informed by several cornerstone circular economic concepts:

- Given the reality of Earth's finite resources, there are no viable long-term alternatives to the practice of sustainability.
- Reclassifying waste as another source of raw materials can extend the useful life of many resources.
- Switching to corporate renewable energy sources and recycled materials increases resilience by providing a hedge against rising fuel prices, reducing dependence on new raw materials, and eliminating uncertainties about future availability.
- Expanding the environmental focus from 3 R's (reduce, recycle, reuse) to 5 R's (repair, reuse, refurbish, remanufacture, and recycle) facilitates a mindset that comes as close as possible to eliminating waste in technical materials.

Circular economic models, processes, and practices can be used to help future-proof a corporation and its supply chain by developing greater resiliency. The World Business Council for Sustainable

Development has identified eight positive outcomes from circular thinking, including adaptive business models and innovation, both of which contribute to a business' overall responsiveness in the face of challenge and change.

Expanding the environmental focus from 3 R's to 5 facilitates a mindset that comes as close as possible to eliminating waste in technical materials.

The ability to withstand fluctuations is critical to sustaining a company over the long term, but also in developing a reliable and consistent brand that consumers can trust. By optimizing resource consumption, businesses can build long-term confidence and commitment with their customers. This will become increasingly important

Eight business cases managers can use to justify circular economy practices across the board

- **Gener8**: create additional revenue from existing products and processes
- **Innov8**: spur innovation of new products and services
- **Moder8**: reduce operating costs
- **Captiv8**: engage customers and employees
- **Differenti8**: distinguish from competition
- **Integr8**: align with corporate strategy or mission
- **Acclim8**: adapt business models and value chain relationships
- **Insul8**: mitigate linear risk exposure

Source: World Business Council for Sustainable Development



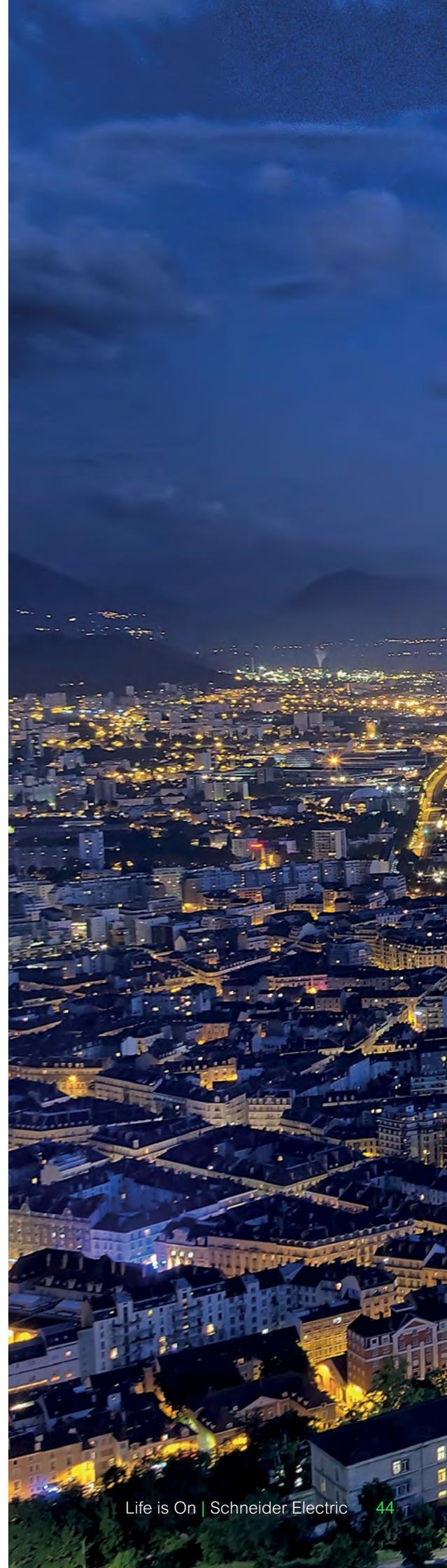
as companies shift from linear economic models to ones that are based in services and circularity. By demonstrating to consumers that companies care about the long-term sustainability not only of their business, but the planet, trust is engendered, and a new level of relationship established with the customer.

One company that is using its circular business model to drive this kind of customer engagement is Patagonia. Patagonia's commitment to sustainability and global action is front and center to its brand. The company's Worn Wear® program provides a virtual marketplace where consumers can source used Patagonia gear and get instructions on how to repair gear, as well as instructions on where worn materials can be traded in and recycled. The company has successfully used its brand, its commitment to sustainability and circularity, and its Worn Wear program to engage consumers, developing a roadshow program that travels from city-to-city.¹³

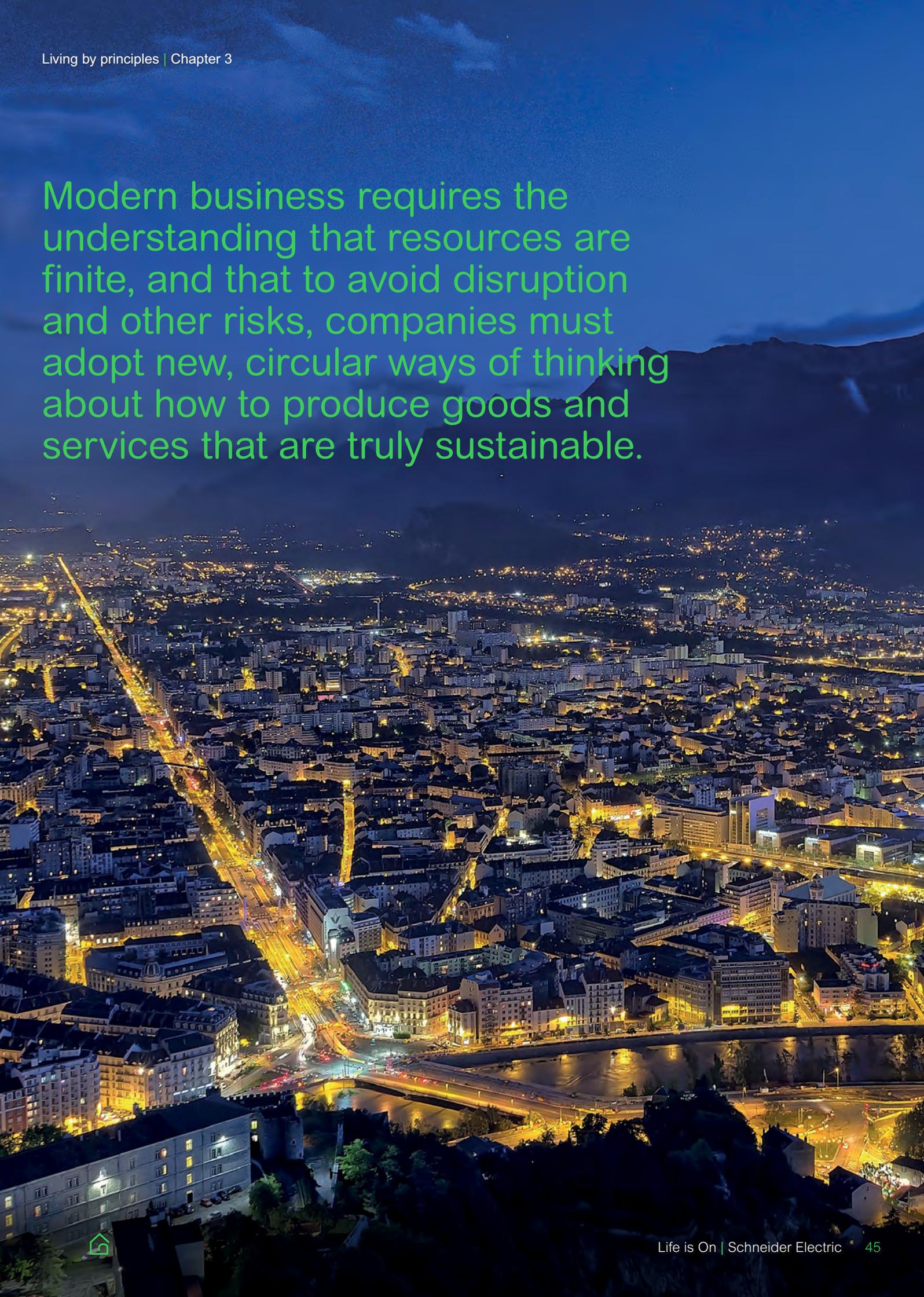
Bottom Line

Modern business requires the understanding that resources are finite, and that to avoid disruption and other risks, companies must adopt new, circular ways of thinking about how to produce goods and services that are truly sustainable.

The good news is that companies are increasingly thinking this way, and exploring the means to redeploy their business more responsibly, driving not only resiliency, but ROI.



Modern business requires the understanding that resources are finite, and that to avoid disruption and other risks, companies must adopt new, circular ways of thinking about how to produce goods and services that are truly sustainable.



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04

Living with integrity



Chapter 4 – LIVING WITH INTEGRITY: Sustainability as an integral part of business risk mitigation

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Introduction

Achieving corporate sustainability, perhaps the truest measure of a firm's success, is part and parcel to planning for business continuity and prosperity over the long term.

The desire to be recognized as sustainable is at the forefront of concern for many industries today. Investors, non-governmental organizations (NGOs), consumers, and advocacy organizations are pushing hard for companies to demonstrate accountability, traceability, circularity, and resiliency. They want to know that the products a company is producing are safe, useful, and not detrimental to the environment or humanity. Many companies are extending their practices to the supply chain, where attention has been paid to labor conditions and upstream and downstream impacts of production.

When companies place responsibility at the center of their operation — focusing on how their products, operations, and supply chain affect the health and safety of workers, consumers, and the environment, an effort that has become simplified with digitization — the result is a clear vision of a firm's path to sustainability and long-term prosperity.

All companies can use digitization, connectivity, and the Internet of Things (IoT) to drive data and greater transparency.

Sustainability has historically been built on the foundation of the so-called *triple bottom line* of planet, people, and profit (sometimes also called *performance*). By attending to these three concerns equally, companies can use sustainability as a foundation to build trust with consumers and other stakeholders.

Planet – The environmental challenges facing humanity include a mix of important global issues ranging from climate change to species extinction to ocean degradation. Companies have an enormous role to play in planetary health, and can positively affect the environment by adopting business practices such as responsible governance, efficiency, circularity, natural resources waste reduction, and renewable electricity.

Companies are increasingly engaged on environmental issues and demonstrate this through goal-setting and commitments — such as the RE100 or CE100 — and through disclosure and reporting. Collectively, there were more than 7,000 responses to CDP climate, water, and forestry programs in 2017, and Schneider Electric's Energy & Sustainability Services manages more than 40 million metric tons of CO₂ for its clients every year. Companies that report on sustainability realize valuable outcomes, including increases in reputation



and employee loyalty, improved access to capital, and increased efficiency in decision-making.¹

People – Business operations are intimately linked to how the goods and services a company produces impact people. It is incumbent upon companies to limit toxins, improve access to water and energy, and empower local labor through their efforts, rather than harming their workers, their consumers, or the communities in which they operate. Practices such as fair trade, which provides workers with a fair wage and contributes to education and other community-enhancing practices in rural areas, is an example of a way companies seek to improve their treatment of people.

Profit – Business leaders naturally design their products and their brand around profitability, as they must if they are fiscally responsible. However, increasingly, companies are finding that their long-term profitability model must address sustainability to future-proof operations. Businesses aren't the only ones interested in sustainability to manage risk: investors are too. There is now a growing awareness that integrating the consideration of environmental risks into investment processes will improve investment performance. Take, for instance, the fossil fuel divestiture movement. Some investors are concerned that their investments in carbon-intensive companies may deliver lower returns given stricter climate policy and technological change. Others take a more extreme view that earning profits from such activities is unethical. Investors divested a total of \$2.6 trillion in 2015.²

The new goal for sustainable business practices is to begin to deliver *shared value* to a company's stakeholders. This broader view of responsibility encompasses a fourth operational consideration: purpose. As companies respond to pressures such as

the traceability of the origin of raw materials, labor condition concerns, the impacts of producing and transporting goods, and the corporate role in climate change, these same companies have realized that long-term relationships with their stakeholders rests in doing business differently.



Circular economic practices are one means companies are using to achieve this value. Others are pursuing new business models, such as the Benefit Corporation (B Corp), which believes business can be a force for good.³ All companies can use digitization, connectivity, and the Internet of Things (IoT) to drive data and greater transparency. In the end, these responsible practices build trust with consumers and peace of mind that the goods and services they are consuming aren't doing more harm than good.

In this section, we'll explore how companies are using responsibility to drive shared value, and how these practices can positively impact a business's reputation—and bottom line.

How responsible business practices influence consumers

People care about sustainable goods and services. Consider:

- More than 50% of customers prefer sustainable brands.
- Sustainable brands have outpaced the market by 120%.⁴
- 86% of consumers said they would be more likely to trust a company that reports corporate social responsibility results.

In the digital age, 57% of consumer purchasing decisions are complete before a customer even calls a supplier.⁵ Organizations that choose to make sustainability an integral and transparent part of their corporate and product philosophy have an opportunity to generate substantial gains from customers who can easily discover and validate company responsibility claims. The validity of these claims — and the openness with which they are disclosed and reported — build credibility and trust.

People and planet are compatible

The city of Houston, Texas realized the aging control systems in its numerous city buildings were not only inefficient but also were not providing worker and visitor comfort. By installing expert systems to track energy performance, room sensors to provide environmental data, and intelligent control systems to adjust system performance, the city improved human comfort while also reducing both its greenhouse gas emissions and its water use.⁶



Today's emphasis on customer "big data" has made that trust more important than ever. Wary consumers are far more likely to spend their budget and share their data with companies they believe will use it ethically and securely. As a result, consumer trust has become a new competitive differentiator and a critical component in a customer-centric sustainability effort.

It's difficult for businesses to place a value on customer trust, yet the benefits of a higher lifetime value of a client and product preference are clear. A substantial increase in available corporate information also has made companies far more visible to their customer bases. Fast access to online data has driven the importance and acceptance of unfiltered, publicly available customer reviews, internal customer satisfaction surveys, and industry and product certifications to support company claims and speed prospects through their buyer's journey.

Leading brands are clearly cognizant of the role responsible resource use and sustainability play in helping them to manage risks and reputation. In a recent study by Schneider Electric and GreenBiz, 85% of respondents listed brand or risk to shareholders the primary drivers for their energy and sustainability initiatives, ahead of even cost savings (69%).⁷

The ultimate in human peace of mind is achieved when the state of the planet we all live on is improving instead of deteriorating, when global humanity is enabled to grow responsibly, and when businesses prosper thus affording additional opportunity to more people. These are the benefits of sustainability.

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Health and safety

The health and safety of goods and services is another critical component of both corporate responsibility and consumer trust. Most forward-looking companies realize that maximizing health and safety for employees, customers, and greater society is a sustainability concern. However, developing and maintaining a company culture that places a high value on health and safety requires a commitment of time, energy, and resources.

Businesses are under constant pressure to be productive, but an ongoing focus on and commitment to health and safety benefits productivity in the long run. In the United States, according to OSHA, “businesses spend \$170 billion a year on costs associated with occupational injuries and illnesses – expenditures that come straight out of company profits. But workplaces that establish safety and health management systems can reduce their injury and illness costs by 20 to 40 percent.”⁸

When companies view health and safety concerns as opportunities for improvement instead of weighty burdens to be borne, the result can both benefit users and provide a competitive business edge.

When companies view health and safety concerns as opportunities for improvement instead of weighty burdens to be borne, the result can benefit users and provide a competitive business edge. Clear and consistent compliance with regulations and proactive voluntary health, safety, and sustainability measures can bring about significant improvements in manufacturing, for example, such as the elimination of many potentially harmful substances for which benign substitutes are readily available. Companies that adopt the most stringent standards as their global guidelines help raise the bar for health and safety concerns around the world. The result is increased sustainability.



At the most basic, sustainability and safety are really about the same thing: conserving resources and deploying capital wisely and responsibly. Progressive companies and the innovators that work for them understand this, and embrace health and safety — of people and the planet — as guiding principles, frequently going far beyond the minimum.

For example, The Edge in Amsterdam is a net-zero energy building that uses IoT to provide optimal comfort — and control over the work environment — to occupants. At the same time, the building produces 102% of the energy required for its ongoing operations, making it one of the most sustainable buildings on Earth.⁹ The combination of a healthy atmosphere and environmental responsibility has made The Edge a highly desirable place to work.

Similarly, at Cascades Inc.'s Norampac cardboard box factory in Quebec, Canada, the installation of a Schneider Electric EcoStruxure™ Building Expert control system resulted in a 25% savings in heating costs while also requiring far less labor and material to install, thanks to its wireless implementation. The system also increased worker comfort by enabling central management of temperature setpoints for 25 space heaters spread throughout the facility according to schedules, rather than relying on old, mechanical thermostats.¹⁰

Safety and comfort in the workplace is just one area of sustainability concern. Product safety incidents impact consumers. In the United States, for example, the Consumer Product Safety Commission announces recalls on at least one product every day, on average. Sometimes these recalls go unnoticed by consumers; other times, buyers suffer injuries, and even death, due to unsafe goods.

Evaluating chemistry without giving away formulation secrets

Mammoth U.S.-based retailer Wal-Mart wanted to be able to compare the array of chemical products it sells to ensure product safety, but also to make suggestions regarding improvements while not adversely affecting cost or effectiveness. The challenge was finding a way to make a detailed investigation of product ingredients without compromising the security and privacy of chemical formulations.

In 2006, the company began using the ingredient-screening software GreenWERCS, an automated tool that determines how “green” chemical-based products are. The company subsequently determined numerical scores for more than 400,000 UPCs reflecting their comparative environmental health and safety status. GreenWERCS became commercially available in 2009 and today is widely used by manufacturers and others to check actual product composition against established lists of chemicals of concern.¹¹



What is the impact of these lapses in safety? In 2009, a salmonella outbreak linked to peanut butter and other products was believed to have sickened as many as 22,000 people. The fallout bankrupted a large peanut-processing company and led to a criminal conviction against its chief executive. In 2014, one manufacturer recalled 1.1 million of its wearable fitness trackers after some buyers had allergic reactions to the device’s materials. The Consumer Product Safety Commission received more than 10,000 incident reports, making it the agency’s second-largest recall in terms of reported injuries.¹²



At the most basic, sustainability and safety are really about the same thing: conserving resources and deploying capital wisely and responsibly.

One U.S.-based restaurant chain that prides itself on its use of sustainable and natural ingredients has been plagued by a series of foodborne illness complaints that have caused significant damage to the company and its brand, including falling stock prices.

In a customer survey conducted by Schneider Electric, respondents indicated that longer product lifecycles, the absence of hazardous chemical substances in products, and efficient products made with environmentally-friendly materials were important to the future of their businesses. What’s clear is that businesses across all industries need to incorporate health and safety into their sustainability strategy.

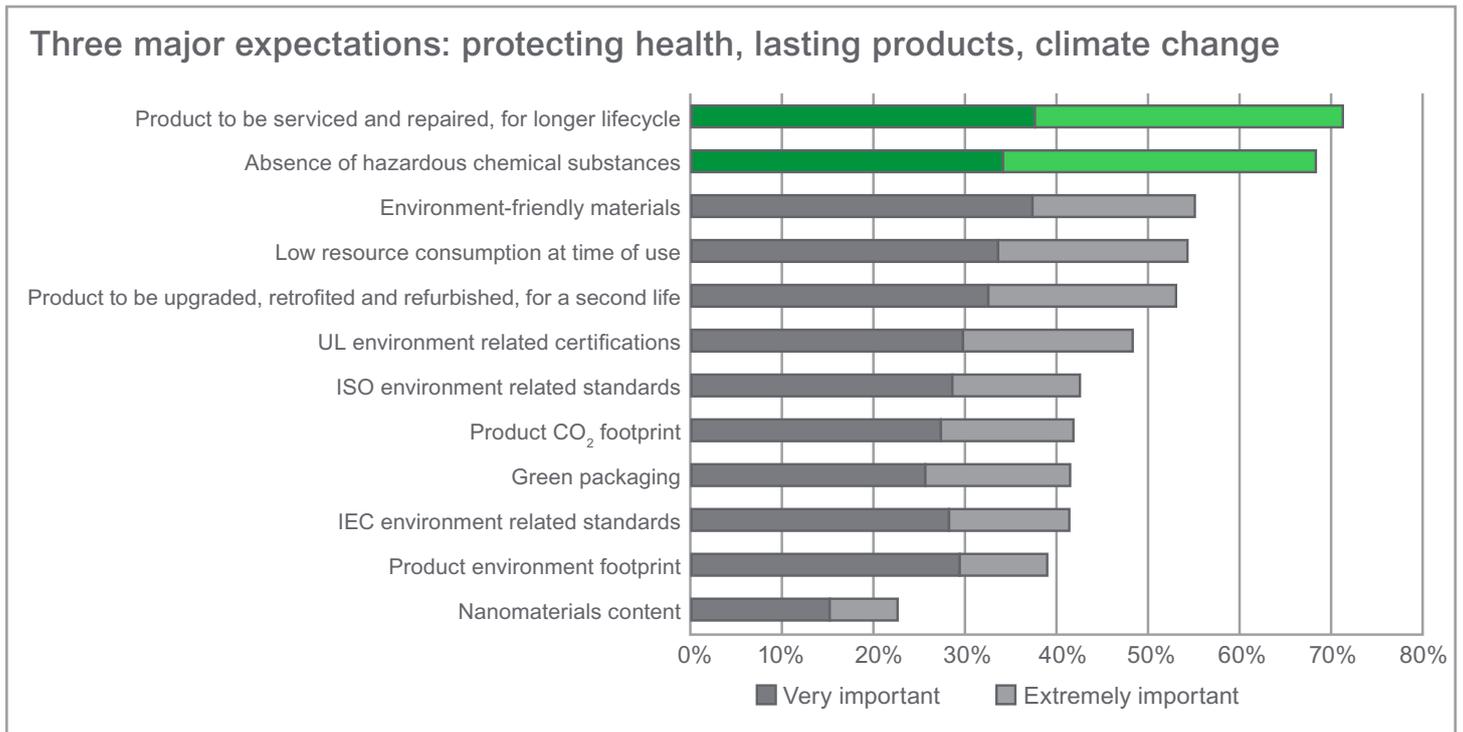


Figure 1 - Three major customer expectations (Source: Schneider Electric Customer Survey, July 2016)

Reaching beyond regulations

Numerous jurisdictions routinely enact guidelines, rules, and regulations to help protect the health, safety, and trust of consumers. Consider the U.S.-based Center for Resource Solutions, the administrators of the Green-e® Energy program, which ensures the validity of renewable energy certificates and has become a worldwide standard for protection against double-counting of renewable energy claims.

The European Union (EU) has established two strong sets of product regulations that guide the health and safety of goods produced in EU member countries: the Restriction of Hazardous Substances (RoHS) directive and the Regulation on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH).¹³



The need to comply with regulations is far-reaching. When Schneider Electric surveyed a cross section of its customers, 30% of the more than 1500 respondents indicated that their projects included specific environmental requirements such as RoHS, REACH, and numerous others, such as the LEED® green building designation.¹⁴

The fundamental challenge for all industries is to demonstrate that a given product, part, solution, or service is healthy, safe, and performs as expected. Within organizations where health and safety are a top priority, an evidence-based formal document known as a safety case is often required to convince regulators of the validity of any product safety claims. This evidence needs to stand up not only on paper, but also must be made applicable to real-life situations.

Building a safety case is progressive as the product development moves through different project phases, providing proof at each stage that safety risks are reduced to an acceptable level. The safety case gathers momentum by presenting evidence of the qualitative and quantitative aspects of the functional safety. This approach focuses not only on the technological aspects of the product in question, but also on processes, methods and compliance practices surrounding the offering.

Sustainability is the evolution of the safety case compliance process, where consumers are now placing greater emphasis on transparency and responsibility throughout the value chain. Traceability is the answer of leading companies in sustainability as they can demonstrate that their products are *life compatible*, or healthy and safe for both

the planet and its people. Circular business models take this one step further by allowing companies to demonstrate that their products are safe and life compatible from production, through consumption, to end of life.

Certification and validation are also key criteria for product safety, reliability, and sustainability. Certification is an important milestone to achieve for any manufacturer that hopes to eventually release a product to the marketplace. Failure on the part of either manufacturers or certifiers to validate product safety or sustainability can potentially result in myriad losses: loss of revenue through legal actions or falling stock prices, loss of customer confidence, loss of brand reputation and market share, and potentially, loss of life. The Schneider Electric survey also found that over 25% of customers are willing to pay more for products with environmental certification.¹⁵

Validation through independent assessment is another central requirement of sound functional safety practice, and crucial to consumer protections on sustainability as well. Evidence must be presented to an independent assessor during a product's development, or after

Regulations foster responsibility

The RoHS directive prohibits the use of six specific substances, plus four types of phthalates. RoHS requirements differentiate between electrical and nonelectrical equipment, and manufacturers can take advantage of numerous exemptions. For example, small amounts of lead are acceptable in specific applications, even though lead is one of the six hazardous substances singled out by RoHS. Although the RoHS directive originally went into effect in 2003, a 2011 update (RoHS 2) expanded its coverage and clarified exemptions.

When REACH was introduced in 2007, manufacturers became directly responsible for guarding against the effects of chemical use. The directive includes chemical ingredients, chemicals used in the manufacturing process, such as for cleaning or rinsing, and chemicals in manufactured articles. Of the 14,000 chemicals now registered in the REACH database, 169 already are considered substances of very high concern (SVHC), and that list continues to grow.

Companies that are serious about maintaining high standards of product health, safety, and sustainability generally do not take advantage of the regulatory allowances and possible exemptions. The strictest environmental regulations (like RoHS and REACH compliance) should be embraced and applied broadly so that all consumers worldwide can benefit.



a product’s performance, to assure the assessor that the product or system being developed will be acceptably safe and will operate sustainably.

Bottom line

Sustainability, shared value, responsible and ethical business practices, and the health and safety of people and planet are intertwined. As corporate efforts to improve the sustainability of goods and services intensify, companies are also stepping up best practices for launching inherently safe and sustainable products that make a positive contribution and reduce reputational and stakeholder risks.

By exceeding customer expectations for trustworthiness, and regulatory compliance for health and safety, companies can simultaneously impact operational costs, improve revenues, and deepen long-term relationships with customers. Companies that succeed in achieving true responsibility brand themselves as ambassadors of sustainability and safety, and establish a competitive advantage that others will have difficulty overcoming.

How Schneider Electric’s Green Premium™ label helps demonstrate sustainability

One way that Schneider Electric has met the safety, health, and sustainability challenge is by developing Green Premium, an ecolabel that provides Schneider Electric customers and end-users with the means to confirm product regulatory and environmental compliance.

The Green Premium label is awarded only to products that are documented as:

- Meeting RoHS requirements
- Complying with REACH regulations
- Having a comprehensive Product Environmental Profile (PEP)
- Including End-of-Life instructions (EoLi)

The program provides transparency into the impact of each product and gives end-users a high degree of confidence that they are deploying environmentally sound technology.

Green Premium is useful to specifiers and contractors seeking green certification through any of the myriad local, national, and international organizations offering such recognition. Green Premium product specifications are available at any time via the company’s web portal, making it easier for customers to find environmentally responsible products that meet specific project criteria.¹⁶

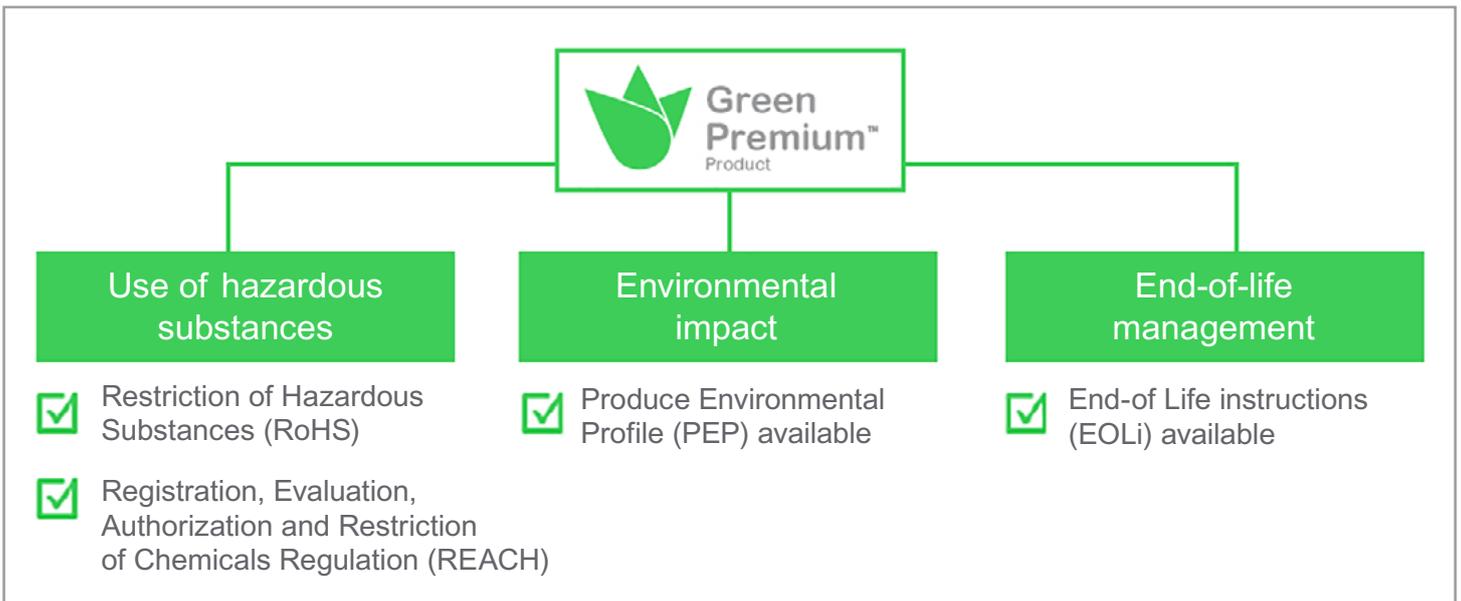


Figure 2 - Source: Schneider Electric



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Learn more.

At Schneider Electric, sustainability works.

Schneider Electric launched its sustainability approach in 2002. Since then, the company has grown to be a global leader, widely recognized as one of the most respected, ethical, and sustainable companies in the world.

On top of its own progressive approach to corporate sustainability, Schneider Electric's products, programs, and services lead the industry on environmental and social responsibility by addressing specific, pressing challenges in a customer-centric way.

- **ecoLabel Green Premium**, the self-declaring label program for Schneider Electric products that since 2008 has promoted compliance and transparency concerning use of hazardous substances, environmental impact, and end-of-life management.
- **Green Premium 2.0**, a new Schneider Electric environmental brand promise, redesigned to include value proposals tailored to different segments that will cover products, services, systems, solutions, and architectures.
- **ecoDesign Way**, our corporate commitment to designing all new products and solutions to reduce their environmental impacts throughout their life cycles.
- **ecoFit**, our field services and retrofit program designed to help customers extend the life of their medium- and low-voltage electrical distribution equipment through selective component upgrades and replacements.
- **Tailored Sustainable Connected Supply Chain 4.0 (TSC 4.0)**, a reimagined customer-centric strategy designed to be collaborative, lean, agile, project-driven, and fully flexible so we can improve our speed and responsiveness.
- **EcoStruxure™**, our next generation of active energy management and automation architecture, is driving innovation at every level to take full advantage of our connected products.
- **Energy & Sustainability Services (ESS)**, which is a trusted advisor to corporations worldwide on energy procurement, energy efficiency, renewable and clean technologies, and sustainability. Our ESS offer includes EcoStruxure™ Resource Advisor, our award-winning data management platform, and NEO Network™, our innovative global renewable energy transaction enabler.

Learn more at www.schneider-electric.com/sustainability

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