Benefits Organizations Pursue when Seeking Competitive Advantage by Improving Environmental Performance

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Abstract
Organizations cognitive of the strategic risk and opportunities associated with environmental challenges may employ industrial ecology (IE) concepts, methods and tools to develop capabilities that both enhance environmental performance and provide competitive benefits. We introduce a typology of strategic benefits related to competitive advantage that are enabled by improved environmental performance. Industry examples illustrate how organizations embed IE concepts and methods into systems to generate capabilities that deliver these benefits and configure them for competitive advantage. The examples demonstrate the idiosyncratic, path-dependent nature of capability-development that helps sustain advantage, especially when competitors lack cognition of the global scope of the challenge, and the risks and benefits involved.

1. Introduction
When planning for environmental improvement, decision makers aspire to recognize and generate mission-central benefits. This article illustrates a typology of benefits leading organizations pursue when employing industrial ecology (IE) concepts and techniques to seek competitive advantage. Decision makers and those who influence them become more effective at mustering resources to improve environmental performance when they recognize the full spectrum of potential benefits (Eggers and Kaplan 2013; Hart and Dowell 2011). Conversely, insufficient cognition of potential benefits may lead to failure in both environmental improvement and competitive position. We use eco-cognition to refer to the capabilities by which organizations recognize benefits that source from improvement of environmental performance. For example, Toyota initially priced its Prius at a premium, so much higher than equivalent products from competitors that purchasers could not capture net economic gains from fuel savings. However, sales exceeded expectations because early purchasers bought the hybrid to make a life-style statement that they cared deeply about people and their future (Heffner et al. 2007). That benefit enabled the premium price. Today consumers purchase a Prius not only for economic and lifestyle reasons, but also because a Prius offers a quiet ride that had only been available in luxury-priced vehicles (Ozaki and Sevastyanova 2011). While the fundamental

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concept of dematerialization led to development of hybrid technology, eco-cognition provided insights to market behavior that helped justify and sell hybrids and create competitive advantage. This article illustrates a typology of benefits from leading organizations that demonstrate how improvement to environmental performance enables competitive advantage.

2. Benefit Typology
To effectively seek competitive advantage, decision makers, and those who influence them, must consider a broad array of potential organizational benefits when planning environmental-improvement activities. The benefit typology presented in figure 1 includes seven traditional domains where IE improves competitive delivery of benefits: markets and products, reputation, risk, human resources, sourcing, collaboration, and strategic direction. The typology, compiled from more than 100 organizations, presents benefits in domains that organizations typically manage.

The remainder of this paper illustrates those benefits with organizational examples that address the subcategories of each benefit domain. Since organizations seek bundles of benefits when improving environmental performance, each example elucidates benefits from a variety of domains.

3. Benefits related to Products and Markets
Improved environmental performance may create competitive advantage with products and markets by strengthening legitimacy and access to markets, bolstering knowledge of consumer behavior, innovating products and services, launching new brands and marketing campaigns, developing new collaborations and channels, generating new markets, and increasing market share. The examples below illustrate these benefits.

Figure 1. Benefits in seven domains that enable competitive advantage
3.1 Product and market benefits at Unilever
To develop competitive strategies, (Unilever 2010) conducted hundreds of life cycle analyses (LCA) in 14 countries that revealed significant environmental impacts in their supply and customer chains (26% of their greenhouse gases (GHGs) in agriculture, 68% in consumer use; 50% of their water use in agriculture, 50% in consumer use; 59% of their waste in primary packaging, 14% in transport packaging, 27% in product leftovers). Through collaboration with outside experts, partners and suppliers, they crafted strategies that targeted innovation to products and systems with the greatest environmental impacts. Four product families (soap, shower gel and skin care; laundry detergents and fabric conditioners; shampoo and conditioners; and soups, sauces and stock cubes) contributed 78% of life-cycle GHGs and consumed 84% of life-cycle water. Those strategies precipitated innovations that, for example, enabled consumers to rinse clothes with less water, resulting in faster washing cycles that led to a Comfort One Rinse branding strategy, a strategy that placed product in 12.5 million households while generating a 60% revenue growth in Vietnam. The brand targets 70 million households by 2020. In addition to brand development, sales and revenue growth, those improvements provided additional competitive advantage when Tesco and Wal-Mart tightened policies for their suppliers, as Unilever was well positioned to respond ahead of competitors (Bent and Draper 2007).

3.2 Product and market benefits at Grohe
Through LCA, the sanitary fittings company, Grohe, realized that water consumption during consumer use constituted a large environmental impact for many products (Halabi 2010). Through research and development, they crafted low-flow and water-reduction technologies for products such as fixtures and toilets that dramatically reduce water use without constricting consumer benefits during use. For example, sophisticated technologies for faucets and shower heads break water streams into micro flows that increase pressure, creating the sensation of strong water flows, while dramatically reducing consumption.

They recognized (eco-cognition) the benefit of embedding IE and LCA thinking into consumer research, leading to marketing strategies that communicate benefits of reduced-resource consumption in a manner that connected to consumer values. Toilets that employ less water produce less noise and are marketed as ‘whisper quiet’, a benefit important to sleeping babies and partners. Less water enabled design of thin tanks that sit invisibly within walls, enlarging useful bathroom space, a benefit further developed into a fold-up toilet, attractive to home remodelers who seek to enlarge bathrooms and improve bathroom aesthetics without increasing the room’s footprint. Other water-saving devices, such as quick-response thermostats, heat water in 0.3 seconds, faster than competitors whose technology must heat more water. That reduced water-flow created competitive advantage through consumer benefits such as hot water on demand, while lowering energy use 20%. In the cases above, most residential consumers sought benefits other than water and cost savings. Eco-cognition revealed benefits (space, noise, time, cost, water) capable of attracting additional sales, moving the product beyond a niche market, spurring market growth and gaining competitive advantage (Finster et al. 2001).

To further leverage their water-reduction technology and eco-cognition, Grohe branded both the fixtures (DreamSpray) and the technology (Eco-Joy) as part of a strategy that develops new technologies and innovative products through embedding of LCA and other IE methodologies in
the product development system (Grohe 2013). Innovative technologies are first branded as Eco-
Joy products and offered at premium pricing to fund development. Over time, as competitors
replicate these innovations, Grohe plans to develop new technologies through these capabilities,
and migrate old technology into their mainstream products, thereby leveraging both reduction of
resources and cost savings during consumer use, as well as other benefits (time, space) revealed
through eco-cognition, benefits that provide competitive advantage at the product level.

Grohe further leveraged their resource-reduction capabilities to target new markets for their
innovative products, such as the arid Middle East that has some of the world’s highest per-capital
water consumption. Grohe’s success in reducing resource use and environmental impacts
provided reputation gains as leaders in water-reduction technology. That reputation enabled
collaboration with government officials and others interested in water reduction, including water
utility providers such as the Dubai Electricity and Water Authority (DEWA), who struggle with
economical water provision to growing demand in an arid climate. For example, the Middle East
leads the world in expensive desalination water generation (Nair and Kumar 2013).
Collaboration with DEWA and further consumer LCAs identified mosques as key water
consumers and clarified cultural practices for water use, such as ablution - cleansing ritual that
precedes daily prayers.

Grohe employed its eco-cognition, technologies and life-cycle insights to launch its "Green
Mosque" initiative in Dubai. In collaboration with the Ministry of Water, DEWA and local
Sesam Business Consultants, Grohe donated mixers to the Abu-Hamed Ghazali Mosque
resulting in a 30% decrease in water usage, while demonstrating a two-month payback. The
mosque marketing campaign grew to Syria, Saudi Arabia, Jordan, Bahrain and Lebanon,
including one of Islam’s most significant establishments, the Great Umayyad Mosque in
Damascus, a destination for thousands of worshippers and tourists daily (Nair 2013). Their use of
Grohe’s water-saving products legitimized Grohe’s presence in the Islamic community and
demonstrated market benefits of resource reduction, value enhanced by eco-cognition of prophet
Al-Ghazali’s (Ghazali 1966) teachings that promote water conservation during ablution.

That new legitimacy and the urgency for water-reduction precipitated new partnerships with
government initiatives, such as the United Arab Emirates’ Water Saving Campaign. In this new
marketing channel, Grohe provided expertise that clarified the need for water-saving technology
and educated stakeholders about the benefits and options available to reduce water consumption.

Grohe then expanded their initiative to other high-water-use areas with the “Green Hotels”,
“Green Hospitals” and “Green Schools” campaigns. Daily per-capita water consumption in
hotels averages two to five times more than in residential settings. In addition to demonstrated
savings with water and cost, and short payback times, eco-cognition enable Grohe to tout the
benefits of enlarged bathrooms while creating ‘whisper quiet’ rooms for hotel guests.

Grohe then employed IE to create a learning system for key stakeholders. To provide education
around benefits related to reduced water consumption, Grohe offered “Green Conferences” to
lead customers (Lin and Seepersad 2007; Von Hippel 1986), such as interior designers, architects
and engineers. These conferences provided analysis of the water crisis and approaches to
solutions, employing IE concepts and LCA insights to deliver knowledge and demonstrate
findings. Grohe also engaged universities and taught engineering, architectural and interior design students who will be key decision-makers regarding design and purchase of water-related infrastructure. Those engagements strengthened access to key human resources.

Finally Grohe recognized that the developed world also lacked the prerequisite knowledge to understand the imminent water crisis and to engage effective solutions. So they employed an reverse-innovation approach, moving the procedures for eco-cognition spawned in the Middle East to post-industrial countries, expanding campaigns to educate lead customers in the United States, for example.

To gain competitive advantage, Grohe not only embedded IE concepts and technologies into a variety of its own systems, and employed the resulting reputational gains to enhance legitimacy and gain access to new markets, but also developed an approach to eco-cognition and water reduction consistent with human ecology, such as local culture and social practices. They engaged local consultants, partnered with local government officials and institutions, and expanded benefits to local religious practice and beliefs. They collaborated with local educational and religious institutions, and with professional associations to educate key decision makers. These practices constitute a complex web of activities that embed IE thinking and practices into social and technical systems. These practices not only develop sustained behavior change, they also produce an idiosyncratic, path-dependent, complex approach that is difficult for competitors to copy due to first mover advantages (Gavronski et al. 2011; Hart 1995; Hart and Dowell 2011). For example, competitors may find the most attractive government agencies, mosques, hotels, hospitals, schools, professional organizations and college programs unavailable as either customers or for partnerships.

3.3 Product and market benefits: Reverse innovation

Grohe innovated in an environmentally stressed area of the developing world to identify solutions that provided competitive advantage there, and then adapted those solutions to the developed world. This article defines that process as reverse innovation. Organizations engaged in reverse innovation include Nokia, UNICEF, Renault-Nissan, Logitech, John Deere, Nestlé, Unilever, Microsoft, HP, Xerox, Gillette, Santa Clara University (Frugal Innovation Lab), Stanford University (Entrepreneurial Design for Extreme Affordability), and Cambridge University (Inclusive Design) (Anderson and Markides 2007; Govindarajan and Trimble 2012; Jana 2009; Jenkins 2007; Lurtz et al. 2013; Radjou et al. 2012; Wille and Barnham 2009; Schumpeter 2012; Hammond et al. 2007). The examples below further illustrate benefits from product and market innovations related to reverse innovation.

3.3.1 Environmental challenges as drivers of reverse innovation

The developing world, particularly the 4.5 billion people at the base of the pyramid (BoP), face severe and immediate challenges related to resources and environmental performance, such as availability of water and energy, and prevalence of toxins (Landrum 2007). For example, Corcoran and colleagues (2010) report that more than half the world’s hospital beds are occupied by patients suffering from water-related problems, and that more people die from polluted water than are killed by all forms of violence, including wars. Annually, over 1.8 million children under the age of five perish from such disease. Diarrheal disease kills another 2.2 million people, 88% from poor hygiene and unsafe water. Developing countries discharge 90% of their
wastewater into rivers, lakes or oceans without treatment. Since necessity is the mother of invention, the BoP offers a fertile framework for applying IE concepts to spur solutions that shape innovations for the developed world.

The BoP provides an important domain for innovation not only because it faces severe shortages and environmental challenges today, but also because it offers a large, growing market with few competitors, while accounting for nearly all global population growth (Govindarajan and Ramamurti 2011). Furthermore, products and services developed there often result in lean, creative solutions difficult to obtain through first-world development systems. Thus reverse innovation systems co-develop solutions with the BoP, targets solutions for the BoP, and produces and distributes at the BoP (Follman 2012; Jenkins 2005).

3.3.2 Example: Reverse innovation at Procter and Gamble

Procter and Gamble’s (P&G’s) venture in Brazil illustrates how IE applications at the BoP open new markets and provide first-mover competitive advantages while driving reverse innovation. During the recent recession, P&G faced challenges in Brazil with slow growth and layoffs. Population growth occurred primarily at the BoP which was not served well by P&G’s global premium products (Kanter 2008).

Many poor Brazilians live in favelas where P&G struggled to introduce products such as laundry soap, even though the need was strong. P&G attributed failure to lack of experience with favela distribution channels. People there obtain supplies from micro, limited-product stores, often a closet or shed, not from super markets. After developing low-cost production and micro-distribution capability, P&G still sold little. To gain eco-cognition and understand the constraints of limited resources, an immersion team lived with families in the favelas and scrutinized every P&G process. They experienced first-hand the struggle to rinse soapy clothing with limited water supply. Eco-cognition led to innovative products with an entirely new brand, Básico.

Motivated by a higher purpose, the immersion team felt inspired and developed unprecedented collaboration across functions and with customers, for whom the excitement was captivating (Kanter 2008). Innovations included low-water formulas for soap that achieved tremendous success in an arena where few traditional competitors existed. Demand for the first Básico products - women's hygiene, diapers, and greener laundry detergent - immediately exceeded supply. P&G captured market share through small neighborhood shops, substituting colorful store displays for costly TV advertising. Premium products sales also rose.

These innovations, such as P&G’s low-water formulas for soap, soon migrated to the developed world, especially to water scarce regions such as Germany and Australia, where further market research (eco-cognition) discovered a new set of benefits associated with water reduction, such as the ability to complete laundry faster when less water is required for rinsing. P&G now sells the Basic product line in the U.S.

In 2010, P&G targeted four billion people and in 2012, five billion (P&G 2011). While such growth requires development of many capabilities, IE proved essential for identifying the base as a new domain for value creation, for focusing the development on scarce resources, and for
developing the insights to innovate with global appeal. Global appeal arises from the global nature of environmental challenges, such as toxin buildup and resource scarcity.

3.4 Product and market benefit example: Market-research generated reuse
Even those far removed from engineering who understand IE concepts, such as consumer-facing sales personnel, may serve as catalysts that improve environmental performance and provide competitive advantage. For example, at the service units of both General Electric and Lucent, customer-contact personnel first recognized that competitors were capturing their brands at end-of-life (EOL) to provide low-cost replacement components. To remain competitive, their service units requested development of reverse logistics that captured EOL product and prevented competitors from gaining access to those replacement components (Donnelly et al. 2007; Martin et al. 2010). That EOL and subsequent design-for-reuse strengthened competitiveness by reducing part costs, increasing competitor costs, and enabling provision of the widest variety of original-equipment repairs. From a profitability perspective, service parts hold strategic significance not only because after-service frequently drives customer retention and loyalty, but also because, in complex products such as medical imaging, automobiles and aerospace, replacement parts, even when refurbished, are more valuable than original-equipment parts.

4. Benefits related to Risk Management
Risk management identifies and mitigates risks that affect an organization’s capability to compete (Howell 2013). Risk occurs when competitors are better able to address environmentally-related challenges, such as resource shortages, rising prices for supplies, products that consume large amounts of resources, increased regulations, market shifts, supply chain volatility and increasing costs of capital. Advantage may occur when addressing risks better than competitors. Examples below illustrate how IE tools and concepts help address risk management issues related to competitive advantage.

4.1 Risk-management benefits: Profit, credit availability and cost of capital
Investors examine company risk to guide investment strategy and pricing, affecting credit availability and cost of capital. For example, investors controlling one-third of the world’s investment capital, $87 trillion, act as signatories that fund data reporting on GHG emission from the Carbon Disclosure Project (CDP) while major accounting firms and universities work to develop Generally Accepted Accounting Procedures for carbon reporting (CDP 2013; Simnett et al. 2009). Investors care about GHG reporting in part because those Global 500 companies (G500) who lead in either carbon reporting or reduction produce collective profits twice the average of reporting companies over both short and long-term horizons (PwC 2012). CDP also reports that growing percentages of the G500 have integrated reduction initiatives into their overall business strategy (48% of those reporting in 2010 to 78% in 2012) and have board or senior-executive oversight to GHGs (from 85% to 96%). The International Finance Corporation (IFC) reports 11% higher returns from companies that demonstrate environmental and social standards (WWF 2012).

Many financial institutions now collaborate with NGOs, such as the World Wildlife Fund (WWF), to develop new risk management tools and services, and then attach environmental performance criteria to their lending and investment methodology, raising standards in critical
markets. More than 70 financial institutions worldwide, such as Rabobank, the world’s largest agricultural financier, have adopted IFC’s performance standards, such as those of the Marine Stewardship Council and Forest Stewardship Councils (WWF 2012). These developments indicate the growing importance of environmental performance in the acquisition and cost of capital. For example, the investment firm Goldman Sachs (GS Sustain 2009) considers the impact of climate change on companies by examining the carbon intensity and responses of companies, regions, and nations, including company publication of carbon performance and targets for reduction, leadership responsibility, and assessment of their financial impacts. Their data analysis demonstrates the meaningful relationships carbon efficiency has to company valuation in carbon-intensive industries, by calculating the explanatory power of carbon efficiency (CO2-e/assets US$) as a determinant of valuation multiples (EV/EBITDA)4.

4.2 Risk-management benefits at Nestlé

The World Economic Forum (Lee 2013) describes water as society’s greatest risk when considering both impact and likelihood. International Food Policy Research Institute analysis (Veolia Water 2011) explains how water risk provides a driving force for risk reduction to many organizations whose life cycles depend on water. The Water Resources Group (Addams et al. 2009) analysis conducted for organizations in financial, beverage and food industries, reports that, by 2030, the world’s reservoirs will be able to supply only 60% of demand, given current trajectories. They project water shortage of more than 50% for 33% of the world’s population and claim world withdrawal rates will exceed replenish rates by 62%, leading to depletion of many reservoirs and the natural capital they support.

Veolia Water (2011) reports that agriculture consumes 69% of global water use and that 45% of Global GDP will be at risk from future water shortages. As the world’s largest nutrition and food company, Nestlé recognizes the strategic importance of water. LCAs focus risk reduction within their supply chains. Three strategies illustrate how risk-management depends on their LCA analysis and the resulting technologies that involve reduction and reuse (FSG and Nestlé 2007).

First, Nestlé helps farmers reduce water consumption. They educate local farmers on innovative methods, such as drip irrigation, no-till farming, prevention of over irrigation, systems to intensify rice, rain-fed fertilizer balances, and use of crop cover. Second, Nestlé realizes that addressing their supply chain alone will not reduce their risk if others continue to deplete their suppliers’ water basins. So they educate local communities on safe water practices and benefits. They help communities understand how to gather safe water, how to detect if water is safe, and the importance of doing so. By launching grass-roots movements, Nestlé provides communities with tools and resources to gain access to clean safe water. Third, Nestlé trains local communities in a variety of jobs that utilize water-reduction methodology and other environmental improvement practices. By targeting the large number of unskilled and uneducated workers in rural communities throughout the world, they help provide concepts and tools they need to begin successful careers. That training enables them to teach others how to employ similar methods and diffuse both job training and environmental-improvement practices.

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4 EV = Enterprise value; EBITDA = "earnings before interest, taxes, depreciation and amortization," an often-used measure of the value of a business.
5. Benefits related to Sourcing
When embedding environmental performance-improvement capabilities into sourcing, organizations seek competitive advantage through a variety of benefits, included enhanced traceability deep into their supply chains to where resources are extracted from the earth, better vertical integration of supply chains, improved visibility for key organizational members from engineers to sales that create better eco-cognition for improved product development and more-effective sales, transparency for outside stakeholders such as investors, bolstered security, reduced volatility and cost, and improved reverse logistics for reuse (Frohlich and Westbrook 2001; Isil 2013; Klassen and McLaughlin 1996; Rao and Holt 2005).

5.1 Sourcing benefits with shipping: Maersk
Ninety percent of global trade employs sea transportation. Even though ships efficiently move mass goods, the container-shipping industry owns a large footprint, accounting for 3-4% of global CO₂ emitted, more than Germany. Emissions source mostly from bunker fuel, a low grade, heavy oil. The International Maritime Organization sets goals such as sulfur-content reduction from 4.5% to 0.5% by 2020. However that is still 33 times greater than limits for fuel in long-haul trucks in the United States. Ships also discharge ballast water gathered in other ports leading to invasive species that disrupt ecosystems and bear high economic costs by both altering ocean materials that are sold and through cost of remediation (Maersk 2012; Pruzan-Jorgensen and Farrag 2010).

Maersk, the world’s largest shipper, reduced fuel costs 50% by designing an efficient triple-e shaped hull that allowed increased payloads while reducing drag, by adding a second propeller (4% reduction), by developing policy to reduce top speed from 25 to 23 knots (19% reduction), and by cogeneration (9% reduction). The ship’s design closes the loop at end of life, through tracking systems for the all material used in the vessel. A modularized design enables easy updates to components, disassembly at end of life, component and material reuse, and separation of biodegradable and recyclable materials, enhancing Maersk’s bottom line (Jorgensen 2011).

5.2 Sourcing benefit with apparel: H&M, Patagonia, Teijin, Sears, Bagir
Hennes and Mauritz (H&M), the second-largest global fashion chain, recognized the value in discarded clothes (eco-cognition). The EPA reports that the U.S. discards 68 pounds of clothes per capita annually (USEPA 2010). H&M recognized that 95% of the discards could be used again and launched a global clothes-collection initiative where consumers receive a voucher for discarded clothes, bringing more customers to their stores, spurring future sales and strengthening retention, loyalty and brand value (H&M 2012). Patagonia had employed similar strategy for brand development targeting a niche market with its Common Threads recycling program and e-Fibers brands that include polyester, organic cotton, hemp, chlorine-free wool and recycled nylon, developed by its partner Japan’s Teijin Group, a leading manufacturer of synthetic fibers (Unruh 2008). Teijin enabled recycled Capilene to substitute for petroleum resulting in new garments produced with 76% less energy and 42% less GHGs. Teijin gained competitive advantage by developing capability to upcycle waste, such as plastic bottles into clothing, producing fabric for retailers such as Sears Covington Perfect Brand manufactured by the Israeli firm, Bagir Group Ltd. Twenty-five two-liter polyethylene terephthalate bottles upcycle into a man’s suit (GreenerDesign Staff 2009).
5.3 Sourcing benefits through upcycling: Interface

Interface, the world’s largest commercial modular carpet maker, developed capability to upcycle old carpets through a repolymerization process that later evolved into a competitive competency that creates new products from waste. They also reengineered their economic model by turning carpets into a service through a lease program to ensure ownership and recapture at end of life (Agrawal and Toktay 2010). Interface now mines landfills for low-cost supplies that create competitive advantage. For example, their Net-Works program partners with the Zoological Society of London, local experts, fishing communities and conservation groups, such as the Project Seahorse Foundation for Marine Conservation, to collect, process and transport discarded fishing nets and convert them to nylon for new carpet, while providing funding for livelihood development schemes in economically depressed regions suffering from depleting fishing opportunities. Interface’s Mission Zero goal seeks to eliminate all virgin material from their supply chain by 2020, sourcing entirely from waste streams (Anderson and White 2009; Witkin 2013).

5.4 Sourcing benefits: Walmart and The Supplier Consortium

After suppliers achieved as much as 10x return on investment from dematerializing their supply chain (Bayat et al. 2011; Lovins and Cohen 2011), Walmart pushed similar efforts onto their 100,000+ suppliers to bolster their low-cost core competency. They expanded participants from their initial focus on large global suppliers with a simple 15-question assessment, and now tailor assessment to more than 400 product categories, examining impacts on nine stakeholder groups (TSC 2013). The Sustainability Consortium (TSC), established to gain competitive advantage in supply chains through improvement of environmental performance, provides a generic LCA for each product group that helps suppliers focus improvements (Lloyd 2011; Nagappan 2012). They measure health impact by assessing toxins across the life-cycle with a common epidemiological metric, disability adjusted life years, which estimates the impact of toxins on average human life-spans at each stage of the life cycle. They measure LCA resource use through a footprint assessment, square meters of land required to produce resources employed. For example, in wood cabinet making they assess the resource impact of electronics in the equipment used to process wood as well as the years subtracted from human life due to employment of that technology (TSC 2013). Walmart’s vision is to acquire this information for all products it sells and display it prominently for consumers to help them make better choices. They seek differentiation from competitors through supply chain information.

6. Benefits to Reputation

Reputation gains with stakeholders such as customers, investors, employees and communities, can contribute to competitive advantage through improved sales, market share, customer retention and loyalty; lower cost of capital; better employee retention and lowered costs for human resource management activities such as recruitment and promotion; and increased legitimacy (Delmas and Montiel, 2009, Chiu et al 2011). Organizations seek reputation gains through venues such as web communication, participation in industry alliances, adoption of environmental principles and measurement systems, development of charters, and promotion through carbon and sustainability/responsibility reports (MIT-BCG 2011). For example, the portion of the largest 250 global corporations that deliver corporate responsibility reports
increased from 35% in 1999 to more than 95% in 2011 (KPMG 2011). Similarly, CDP (2012) reports that more than 75% of the G500 now disclose their GHG emissions.

The meta-analysis of Orlitzky, Schmidt and Rynes (2003) concluded that organizations undertake environmental management, in part, to improve their reputation with stakeholders such as retailers, consumers, employees, investors, communities, governments, regulators, suppliers and partners. Godfrey (2009) reasoned that environmental improvement activities affords the organization a positive “moral capital” with stakeholders that can act as insurance against negative environmental acts. BSG’s (2011) survey lists reputation gains as the most reported benefit (Haanes et al. 2011). The Grohe example above also illustrates how reputation gains support acquisition of benefits in other domains, such as access to strategic partnerships, legitimacy, and access to markets.

7. Benefits to Human Resources
Improved environmental performance can deliver human-resource benefits related to competitive advantage in several ways (Strandberg 2009). Reduced toxins, green space and daylighting may reduce stress and improve quality of work life (QWL) (Kjellgren and Buhrkall 2010). Improved QWL, such as that found in low-impact buildings, may lead to better health, reduced absenteeism, and higher productivity (Singh et al. 2010; Sustainability Victoria 2007). Reputation gains and improved QWL may also strengthen employee retention, thereby reducing training and new employee orientation costs, as well as costs to attract new talent (Buyse and Verbeke 2003; Renwick et al. 2013). Understanding these benefits and their competitive benefits involves eco-cognition. For example, designing an office building to improve environmental performance can improve QWL, reduce absenteeism and increase productivity by 2%, dwarfing the savings in energy costs, which typically comprise less than 1% of an office building’s payroll costs (Singh et al. 2010; Sustainability Victoria 2007).

Improved QWL and company values that promote social responsibility may also increase motivation and involvement, and thereby increase employee creativity and innovation. Herman Miller (Birchard 2011) and Kantor (2008) report that many employees carry a passion for the environment that motivates improvement and leads to significant gains. Google recognized the competitive gains possible from fundamental changes in perspective involving environmental performance and developed a Green Employees program to help employees to lead low-impact life styles that ingrain low-impact behavior and thinking in their daily actions, both at work and in other aspects of their lives (Google 2010, 2013b). Their 20% Program (Steiber and Alänge 2013) produced new products and solar panels that provide 30% of their energy, community bikes for traveling across campus, and ride-share and shuttle programs that enable employees to work online while commuting, increasing productivity, and turning frustrating daily experiences into valued growth opportunities, not only increasing productivity, but enabling Google to better attract employees in a competitive labor market. Employees also developed electric car-charging stations and spawned campus food gardens that supply their café’s with fresh organic options (Google 2013a).

The P&G reverse-innovation example above further illustrates the benefits to motivation that lead to competitive gains while the Grohe example demonstrates the use of environmental
improvement to leverage access to key human resources at universities, professional organizations and government.

Ernst & Young (2012) found that employees are a key driver to environmental improvement in 22% of companies, ranking second behind customers (37%) and ahead of shareholders (15%), policymakers (7%) and NGOs (7%). Thus improving environmental performance in employee processes may leverage gains that lead to further environmental and competitive improvement.

8. Benefits to Collaboration

During major paradigm shifts, organizations lack the knowledge and technologies necessary to innovate by themselves. For example, Johnson and Johnson (J&J) has a strategic objective to strengthen collaboration around environmental improvement. Walmart built their Sustainable Value Networks (Lubin and Esty 2010; Walmart 2012) to collaborate with external stakeholders such as academics, NGOs and government agencies who spawn innovations related to environmental performance. Walmart then crafts strategies that reduce material and energy flows and cost to improve their low-cost competitive position. Illustrations above of competitive gains from collaboration include Grohe, Unilever, P&G, GE, Nestlé, Interface, and IBM.

A variety of partnerships such as company/NGO, company/company, single industry, and multi-industry coalitions provide valuable, cost-effective knowledge and skills for both improving environmental performance and creating economic value by strengthening corporate credibility and reputation, providing independent validation and helping achieve a long-term vision (GEMI and EDF 2008; Globescan 2012). When collaborating to improve the environment, businesses report benefits through access to expertise and competencies, reduced risk, strengthened reputation and leadership credentials, first-mover advantages, reduced costs, employee engagement, new products and services, innovative business models, value chain practices, establishing and maintaining standards, engaging citizens and consumers, and advocating public policy (Globescan 2012).

For example, biodiversity serves as a key indicator for the health of natural capital (UNEP 2012). As organizations recognize the importance of biodiversity, some, such as Johnson and Johnson (J&J 2010, 2006, 2011) collaborate with outsiders to develop training and plans that address biodiversity. Others participate in collaborations, such as the Rio+20 (UN 2012), the Gaborone Declaration (Conservation International 2012), and the World Business Council for Sustainable Development (WBCSD 2011, 2012, 2013) that seek creation of accounting systems capable of considering biodiversity in organizational decision making.

9. Benefits to Strategic Direction

Knowledge of environmental-improvement concepts and methods helps organizations identify new strategic opportunities and recognize first mover advantages, develop new business domains and strategic directions, mitigate risk with strategic intent, develop new competencies, and deploy environmental improvements that provide competitive advantage more quickly. Nearly all the examples in this article illustrate these benefits, as do the examples below.
Organizations and their stakeholders face steady depletion of non-renewable resources and natural capital services, and increasing regulations and stakeholder pressures that constrain options for future strategic directions while revealing strategic opportunity (UNEP 2012; Grossman et al. 2013). Recognition of the constraints and opportunities reduces risk and enhances the chances for competitive gains. IBM developed eco-cognition around the importance and extent to which environmental challenges affect strategic organizational choices in all areas of the world, and formulated a new strategic direction (Smarter Planet) that seeks competitive advantage by developing capabilities (e.g. for cities, transportation, harbors, energy, health care) to help others identify and address those challenges (Anthony 2012; Korsten and Seider 2010). Building on their core competency, IBM developed capabilities to create integrated solutions, by collecting information on issues related to environmental performance, by connecting that data to key decision makers and by helping them make better decisions through eco-cognition (Palmisano 2008). For example, in Smart Bay, Ireland, IBM engages collaborators who employ buoys and seafloor cables to monitor wave conditions, marine life and pollution levels. They then send integrated information on salinity, temperature, water quality and harmful algae blooms to farmers cultivating shellfish; on weather and water quality to fishers to better ensure safety for their catch; on potential energy in waves to energy companies; and on safety of beaches to tourists. A restaurant patron can engage an app that describes when, where and the water quality in which a fish was caught, and its endangerment (Heffernan 2013). The information flow creates eco-cognition around environmental performance by providing data that connects to attributes stakeholders value.

GE’s ecomagination similarly combined eco-cognition with its core competencies to develop innovative capabilities that help organizations respond to environmental challenges. Ecomagination quickly become GE’s fastest growing business, targeting annual profits at least double that of their next best performing business approach (GE 2011).

10. Conclusion
This article illustrates the importance of recognizing and pursuing mission-central benefits when improving environmental performance. Pursuit of those benefits allows environmental improvement to drive competitive advantage. The typology of benefits informs managers of potential mission-central benefits that leading organizations engage. Organizations may gain competitive advantage by developing capabilities to address environmental challenges because those challenges touch everyone, and because the level of innovation needed far surpasses current capabilities of competitors. Eco-cognition delivers insights that competitors often lack, leading to blue-ocean strategies (Kim and Mauborgne 2005). The capabilities are usually idiosyncratic and path dependent, and thus are difficult to copy, leading to sustained advantage, especially when competitors lack the eco-cognition to understand the global scope of the challenge and the benefits available.
References


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