



2014

INSIDER Knowledge

Lessons Learned from
Corporate Environmental,
Sustainability and
Energy Decision-Makers

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Take a closer look.

Enviance Business Intelligence solutions enable you to effectively estimate scope 3 emissions, without the hassle and ineffectiveness of supplier questionnaires. Furthermore, we help you translate these emissions into bottom line impact. Enviance has the market's most advanced solutions for linking sustainability and financial materiality.

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FROM THE SPONSOR



Enviance is the leading provider of integrated EHS data management solutions to help companies manage risk while increasing profits and competitiveness in the marketplace.

With more than a decade providing environmental data management and expertise, Enviance's proven system is used by the world's largest corporations and government agencies including American Electric Power, ArcelorMittal, Chevron Corporation, Georgia Power, Hess Oil, Los Angeles World Airports, Magellan Midstream Partners, Patriot Coal and Trident Seafoods.

As the world business community faces increasing sustainability challenges, Enviance enables organizations to measure, manage, report and mitigate environmental performance. The Enviance System leverages cloud computing technology to deliver its data platform online anytime, anywhere, enterprise-wide and on mobile devices or your desktop.

The comprehensive system functionality and reporting capabilities were developed for evolving business requirements and based on extensive environmental industry expertise. Complex regulations. Increasing financial risks. Brand perception and valuation. We understand the challenges you face in today's competitive marketplace. Enviance empowers companies to connect compliance and sustainability to core business strategy.

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Improved Business Performance

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Demonstrated Leadership

As the system of record, Enviance goes beyond task management to capture and integrate trillions of data points each year – creating true institutional knowledge and a legally defensible position of compliance.



ENVIANCE creates integrated EHS data management solutions to help companies manage risk while increasing profits and competitiveness in the marketplace.

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LEADERSHIP

Global Trends in Sustainability, 2013

2013 was a dynamic and banner year for sustainability not only in the United States but globally. Within our global sustainability practice at Schneider Electric, we have seen firsthand the practice of sustainability continue to gain traction in virtually all geographic markets and business segments. As sustainability continues to grow, one consistent trend we have seen is that different factors are driving this growth in different regions across the globe.



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In the Americas, global multinationals are deploying sustainability initiatives to address business drivers rather than responding to regulatory pressures. Companies are accomplishing this by taking a close look at their supply chain and identifying risk and opportunities for improvement.

By contrast, in Europe the case for sustainable practices is mandatory due to governmental regulations to comply with standards such as the Energy Efficiency Directive, ISO 50001, and others. Failure to comply with these standards can result in increased taxation, which in turn can affect an organization's bottom line. Compliance, on the other hand, can be rewarding for organizations and may include increased incentives and funding. Due to Europe's strong environmental legacy and its commitment to sustainability, it has created a level of awareness throughout the region that remains unmatched.

We're also seeing an increased focus on sustainability across Asia-Pacific. Many new environmental policies continue to be developed and many of its countries are forming distinct carbon schemes and regulations. As regulations continue to be formed and the focus on environmental issues continues to gain momentum, Asia-Pacific has a great opportunity to become a leader and be on the forefront of sustainability innovation.

"With the increase in extreme weather, we are seeing a return to energy price volatility.

Moving beyond a region-specific view, a global trend that continued to gain steam in 2013 was the focus on renewables in both developed and emerging markets. Despite concerns that renewables are still not cost competitive to grid supply, we have seen a steady and growing interest in the development of unique and cutting edge project structures. With the cost of renewable technologies decreasing, for example - a near 300% technology cost decrease for solar PV in the last 4 years - we are seeing end users evaluating their options and either investing in their own renewable infrastructure or purchasing renewable energy directly from known assets (i.e., direct to a solar, wind or biomass installation). With the increase in extreme weather, we are seeing a return to energy price volatility. Companies will need to manage the risk of this volatility to keep operating costs at a stable level and renewables are a critical consideration in managing energy procurement strategies.

Lastly, in 2013, we saw an expanded focus on retailer/producer responsibility in terms of sustainability. Retailers and brands are seeing the value sustainability brings to their business, and the brand loyalty it builds. More and more these entities are realizing that the assessment and improvement of environmental and social performance through their value chain will add value to their brand and consumer confidence. Self governing associations such as the Sustainable Apparel Coalition are gaining influence, with more and more retailers using industry standards like the Higg Index to identify risks and benchmark their supply chain performance. This trend will continue as technology enables global sharing of sustainability data, and customers and governments increase the need for corporate transparency on sustainability issues.

Leading By Example: A 360-Degree Approach To Sustainability

Canon has built our global business model around protecting and preserving our most precious of resources—the world we share. That is why our founding corporate philosophy has been Kyosei—which we define as, “all people, regardless of race, religion or culture, harmoniously living and working together into the future.” This determination to live and work together for the common good permeates everything we do: from research and development, to product manufacturing, marketing, sales and distribution—a 360-degree approach to sustainability.



Mario Rufino

Manager of Product & Chemical Safety, Corporate Planning,
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We design products with a limited environmental footprint, using low-impact environmental materials, increasing energy efficiency and limiting CO2 emissions. In fact, we were among the first office equipment manufacturers to partner with the Environmental Protection Agency (EPA) in its ENERGY STAR program and among the first manufacturers with qualifying products for a Gold rating in the new imaging equipment category of EPEAT, the global registry for greener electronics.

Through our generation green initiative, Canon has established action plans to help reduce environmental impact at every stage of the “produce-use-recycle” lifecycle, as evidenced through our SmartWay Transport partnership and aggressive toner recycling program, allowing previously used cartridges to be re-used. Since launching our toner cartridge recycling program in 1990, we have collected approximately 240,000 tons of empty toner cartridges around the world.

In addition to using the very products and practices we offer our customers, Canon’s 360-degree approach to sustainability comes full circle, as we sponsor environmental organizations, such as Yellowstone National Park and the Arbor Day Foundation. We also have a Clean Earth Campaign where employees across all Canon offices worldwide volunteer their time to protect and improve the natural environment in their local communities. Further, Canon has one of the largest consolidated ISO 14001 certificates in the world, with over 700 Canon sites certified to this standard.

And most recently, our Canon Americas headquarters in Melville, NY, was awarded LEED Gold certification. Our headquarters may be the best reflection of our commitment to environmental sustainability. From daylight harvesting and water efficient plumbing to aggressive recycling and incentives for employee use of energy efficient automobiles and even bicycles, we are proud to have accomplished LEED Gold certification. In fact, we are the largest commercial property on Long Island, N.Y. to achieve this level of LEED.

Throughout our evolution, Canon has learned that inspiring others is what will help us accomplish our vision of a more sustainable earth. It is a vision that we are proud to help achieve as we lead by example.

The Financial Benefits of Engaging Employees in Sustainability

Is there tangible, measurable value in engaging employees in our sustainability initiatives? Or is it just the “right thing to do” or a “nice to have?” We have proven how valuable it is to the business for



Shelley McIvor

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employees to be engaged and involved in the company's sustainability agenda.

With help from Global Action Plan, O2 has determined the financial benefits of their Think Big Sustainability program. For every £1 that O2 invests in engaging their people in Think Big to deliver sustainability benefits, they deliver £1.40 back to the business. (And this is what the conservative numbers say.)

Increased productivity, reduced absenteeism and decreased employee turnover deliver financial benefits for O2. In addition, participation in the Think Big program represents a significant development opportunity for employees. This perception was reported by both the participants and their managers, both agreeing that Think Big offers a better development opportunity than traditional training options.

We know this is just the first step; we've used the best data available and applied conservative assumptions. To improve our model we want to extend this research to other organizations and produce a robust and comprehensive case study everyone can use. Developing the knowledge is the first step to improving the way that organizations engage with both their employees and sustainability.

Building Bridges to a New Green Economy

In an increasingly complex business world, companies need to develop leaders who can thrive in a volatile, ambiguous and uncertain environment, run a sustainable triple-bottom-line business, and make it profitable.



Linda Morris Kelley

Principal,
Transitioning to Green
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Starting in 2013, and now again in 2014, Transitioning to Green has partnered with Chambers of Commerce to prepare business leaders to successfully navigate today's challenges while constructively guiding their companies to flourish in an emerging, sustainable economy.

Through our LeaderShip for Sustainability Program we are working with leaders of well-known, forward thinking companies to connect sustainability to the core values of their companies and develop the leadership whereby their businesses can tackle critical real-world issues sustainably.

We take a triple-bottom-line, systems approach to sustainability. Sustainable business development and enterprise goes beyond environmental protection. Economic, social and environmental processes are inherently interconnected.

Achieving Sustainability Requires an Integration of Three Dimensions:

- » **People: Employees, Customers, Investors and Communities**
- » **Profits: Financial and Economic Performance**
- » **Planet: Environment and Natural Resources**

The triple bottom line is not an exotic leadership approach or new management gimmick; it is a way of doing everyday business in a new world. Business leaders want to embed practical sustainability because it is the best overall strategy for their businesses to thrive into the future.

While much attention is paid to the technical and operational aspects of sustainability, we must also act with great urgency to integrate a neglected human side of sustainability into the equation: leadership.

By incorporating the GlobStrat strategic triple-bottom-line business simulation into LeaderShip for Sustainability, we are providing leaders with an opportunity to conceptualize and try out new strategies for developing sustainable enterprise in the context of 21st century challenges and opportunities. The interrelated nature of the impacts of leaders' decisions shows up in the overall performance of their simulated businesses, regionally and globally.

Another value of this competitive team play is that it allows leaders to temporarily suspend their mental models and normal style of operating in favor of exploration and experimentation with alternative possibilities. For real change to take place, it is critical that the experiences with this simulation include a structured process for reflection and sense-making in regard to the entire system of context, decisions and interactions.

It is important to overall sustainability that leadership practices include the development of team and group-level competencies, collaboration and shared responsibility that translate into capabilities to implement what they have learned into their actual business. To successfully drive business sustainability, each leader must be able to leverage current profitability while supporting a culture where collaborative innovations and co-opetition operate to increase sustainability.

Leaders must:

- » **Develop their own sustainable leadership capacities, including their adaptability, resilience, versatility, creativity and ecological intelligence**
- » **Competently define a sustainable, triple-bottom-line strategy for competitive advantage**
- » **Translate a sustainable strategy into aligned, coherent action**
- » **Integrate every function of their business with sustainability and societal responsibility**

Together, we business leaders in a new green economy must take care of the future while taking care of today; in building a new green economy, we leaders must take care of people and business today while taking care for the future.

Using Social Tools to Increase Sustainability

As a technology innovator, we use our own products to solve the business challenges we face. In the past year, we've adopted three of our products to inform and improve our corporate sustainability activities. We discovered a variety of ways our social tools can help

uncover material issues, engage our global employees in our sustainability efforts, and reward employee behavior. We hope that sharing our experience will help inspire others to take a fresh look at how social innovation can drive sustainability success.



Erin Decker

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1. Uncovering Material Issues with Social Listening

Salesforce Radian6, our social listening solution that monitors and measures social media activity, helped us uncover material sustainability issues. While planning our first sustainability report, we turned to Salesforce Radian6 to listen to what our stakeholders were saying on social media. We anticipated that we would primarily see comments related to common sustainability issues such as energy efficiency, employee volunteering, and so forth.

In addition, trust, which is at the heart of how we operate, was a material issue to our stakeholders. As a result, we devoted an entire section of our inaugural sustainability report to trust, understanding that it is something our readers would want to know more about.

Outside of the reporting process, we've continued to use Radian6 to help us understand what our customers and the broader social community are saying about our efforts. Tracking the sentiment over time will help us become more responsive to the ever-changing needs of our stakeholders.

2. Engaging Stakeholders with a Custom Social Community

We also make use of Salesforce Chatter, our enterprise social network that allows employees to connect and take action to help shape our sustainability programs. We moderate a sustainability affinity group, which discusses everything from recycling tips for our San Francisco headquarters to coordinating environmental initiatives across our global offices.

We have found that Salesforce Chatter fosters dynamic, two-way conversations between our team and our global workforce. Beyond our offices, we also use Chatter to showcase the

sustainable activities of attendees and staff at Dreamforce, our annual Cloud Computing Industry event through a mobile app.

Salesforce Chatter has helped our sustainability team in San Francisco engage with employees around the globe, and also to generate activity and buzz at important corporate events.

3. Encouraging Sustainable Behavior with Social Gaming

Using Salesforce Work.com, our performance management solution, we're able to reinforce the green habits of our employees by awarding social badges that show up on employee Chatter profiles. Employees can earn a "Green Hero" badge by participating in a variety of sustainability activities, such as joining earthforce, our employee green team.

By recognizing employees for their participation, we're able to reinforce how important our sustainability activities are to the culture of our workplace, and have over time built an "army" of employees who feel valued for their contributions.

10 Reasons To Have a Green Lease

Each year when April 22 rolls around, thousands of companies trumpet their sustainability initiatives paying homage to Earth Day while correlating



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Earth Day to a particular "green" product or service. To reinforce a commitment to the Earth throughout the year, companies can validate their dedication to sustainability by making their office space environmentally friendly. Signing a "green lease" puts that commitment in writing, typically while achieving energy and cost savings. Rising in popularity with corporate tenants and their landlords (and even municipalities like New York City and San Francisco), green leases improve the environmental performance of a leased office space, ensuring that the company occupying the space and the landlord that owns the building are operating in a sustainable manner from the inside out. This energy- and cost-saving tactic typically results in additional cash flow for the building by increasing its appeal to corporate tenants.

Green leases combine the productivity, comfort and sustainability features that tenants are looking for in office space while supporting landlord priorities of improving the triple bottom line and occupancy rates. In addition to achieving both tenant and landlord objectives, green leases have social, economic and environmental implications for companies operating in today's global economy. Green leases truly are the future of commercial real estate.

Ten Reasons to Sign a Green Office Lease

The JLL Energy and Sustainability Services team recommends that tenants and landlords collaborate to develop a green lease that benefits each party, typically including the following 10 benefits:

- » **1. Reduce utility consumption and save money**
- » **2. Improve working relationships between tenants and landlords**
- » **3. Support corporate sustainability initiatives**
- » **4. Enhance corporate image/brand**
- » **5. Demonstrate vision and thought leadership**
- » **6. Improve civic relations**
- » **7. Contribute to LEED and other green certifications**
- » **8. Improve employee productivity, recruitment and retention**
- » **9. Generate additional savings through waste stream diversions**
- » **10. Do the right thing for the environment and its people**

Detail about the specifics—including return on investment—regarding the 10 benefits of having a green lease are in a JLL whitepaper, *How to Structure a Green Lease*.

As tenants and landlords continue to see value in making office space more sustainable, green leases will become the new norm. To make a lease “green,” the terms must be structured to drive sustainable cost savings without negatively impacting building performance or comfort.

As with every lease, the green criteria should undergo careful evaluation to maximize effectiveness, sustainable success and cost savings. When weighing the costs and benefits of a green lease, consider completing an in-depth green lease site assessment and integrating RFP language that incorporates benchmarked green criteria applicable to both new leaseholds and renewing/renegotiating existing ones. Working with an advisor that understands both commercial leasing and green leases is critical to achieving both your real estate goals and your sustainability target.

Collaboration Key to Environmental and Sustainability Innovation

The most significant lesson I've learned this year came from the automotive industry. The Supplier's Partnership (SP) for the Environment has shown that environmental and sustainability innovation needs to be a collaborative process. The greatest recent progress in sustainability management



Gary Vegh

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has been through knowledge-sharing and collaboration, both for automotive OEMs and their supply chains. The SP formed their Materials Efficiency work group to offer manufacturers and environmental regulators a place to collaborate. Here, they have developed tools and systems for making smarter and greener material choices. This work would not be possible without the combined expertise and experience of the automotive industry as a whole coming together.

This year, I was on the organizing committee for the SP's first ever sustainability summit. This brought together people from all aspects of the automotive industry. Here, OEMs, supply chains, academics, and regulators shared their perspectives about the industry challenges. The goal was to create working solutions that can be used by the industry as a whole. I even had the privilege of being a panel member with sustainability specialists from the US, Mexico, and Canada. The solutions born from that summit's collaborative process will have a lasting impact on how the industry operates.

"My advice to any manufacturer – in any industry – is to seek out more opportunities to work with your peers in developing new industry standards and to innovate together.

Although many automotive manufacturers are striving to be the best and greenest, they understand the benefits of working together. Their industry as a whole is much stronger when everyone shares the information and tools needed to be sustainable.

In 2013, ERA Environmental had the opportunity to contribute to collaborative research on end-of-life assessments on vehicles with the SP. The work group shared their findings and experiences about the materials going into their products. Moving forward, we're working to develop a new guidance document that will help OEMs and their supply chains choose greener materials. This will go a long way towards helping them comply with REACH regulations, and any future regulations that may arise. By pooling our knowledge, the data we've collected is more accurate, more useful and will offer greater set of advantages. By collaborating, automotive OEMs reduce their risk and costs associated with disruptive innovations. Working together means a potential innovation can be more rigorously tested before it gets implemented. Joint innovations also encourage greater accountability. No contributor can lag behind without its peers knowing.

My advice to any manufacturer – in any industry – is to seek out more opportunities to work with your peers in developing new industry standards and to innovate together. If your sustainability

model is currently focused on faster, more disruptive innovations that's fine. But invest more time this year in a collaborative effort. You'll find that you can still keep your trade secrets and leadership position while collaborating on mutually beneficial innovation initiatives. By doing so, you'll reduce research costs and implementation risks while establishing yourself on the forefront of your industry.

Eight Key Drivers for Supply Chain Transparency

On January 6, 2014, Intel shocked the world, turning their Consumer Electronics Show keynote address into a manufacturing industry challenge to produce conflict minerals free products. Intel had just announced on stage that all future Intel microprocessors would be conflict minerals free. Within weeks, Apple Inc. followed suit, exposing suppliers that sourced from the conflicted region, District Republic of the Congo.



Lina Ramos

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While these high-profile announcements focused on the SEC's Dodd-Frank Conflict Minerals Disclosure rule, the real issue is more broad. Supply chain transparency enables compliance, and compliance enables legal and ethical navigation through global environments in order to source materials ethically, minimize environmental impact and comply with labor standards.

Every brand has the right to see what goes into their products. Visibility deep into the supply chain is no longer an option but a requirement in order to implement disruptive-free growth strategies. Whether you are addressing Conflict Minerals, REACH/RoHS, Anti-corruption/Foreign Corrupt Practices, Supplier Code of Conduct or Supplier Sustainability Audits, successful implementation can place demands the on-going cooperation of and integration of data from suppliers at every level of the supply chain.

Eight Key Drivers for Program Success

Based on 2013 data collection for supply chain compliance implementation programs, we uncovered these eight key drivers for program's success:

- » **Resources: More technology, more financial and more human capital than one might expect is needed.**
- » **Quality of supplier contact data: this is the biggest challenge.**
- » **Garbage in, garbage out: As we've refined our database, we've disambiguated the contact information.**
- » **Supply chain characteristics (breadth and depth): The more complex, the more you'll need to rely on technology and a system that scales.**

- » **Engagement strategies: Email alone is not a true solution.**
- » **Issuer commitment: Issuers set the expectation that failure to respond is not an option, combined with relationship building and persistence.**
- » **Supplier knowledge of requirements: This is critical: education and 24/7, multi-lingual support.**
- » **Time... is not your friend; start early.**

An implementation approach that includes these eight drivers overcomes supplier resistance and enables more transparency and accountability in a company's supply chain so that global brands can pre-empt vendor risk across all supply chain compliance requirements.

Sustainable Sourcing Ensures Availability of Ingredients

General Mills has been working closely with farmers since the early 1900s. This close connection to farmers and agriculture is a large part of our history, and continues today as we expand our supply chain to include partnerships with farmers of all sizes around the world as we source top-quality ingredients for our more than 100 brands.



Jerry Lynch

Vice President & Chief Sustainability Officer,
General Mills

www.generalmills.com/~/_media/Files/CSR/2013_GRR_summary.ashx

Our most recent efforts around sustainable sourcing include a commitment we made last year to sustainably source our 10 priority ingredients by 2020. This represents more than 50 percent of the company's annual purchases. As a food company, the vitality of our business depends upon access to high-quality ingredients, so ensuring the availability of these ingredients for years to come is absolutely critical.

Our approach involves partnerships with organizations that have a shared mission to advance sustainable sourcing frameworks. We start by piloting scalable solutions, and then share our results so others can learn from our work and build on our efforts.

Two Examples of Work we Have Underway Include:

IN MADAGASCAR, we are working with vanilla supplier Virginia Dare, the international humanitarian organization CARE and Madagascar-based NGO Fanamby to improve farmer incomes as well as the quality, quantity and traceability of vanilla. As we help these smallholder

farmers accrue a greater share of the benefit from the crops they produce, we also are helping to ensure a sustainable and quality supply of vanilla for the future.

IN COTE D'IVOIRE, WEST AFRICA, we are partnering with cocoa supplier Barry Callebaut to help smallholder farmers grow cocoa more sustainably, increase yields, and improve their incomes and livelihoods. In November, 2013, we began sourcing all of the cocoa for our Haagen-Dazs operations in France from a sustainable supply program managed by Barry Callebaut.

Both of these programs demonstrate how, with our partners, we can create value throughout the entire supply chain – for the farmers, our company, our clients and our consumers – all while minimizing our impact on the environment.

Greatest Threats to Improving Environmental Performance & Social Management

During a recent panel discussions hosted by DuPont Sustainable Solutions, we collected data related to the barriers companies confront in pursuing projects aimed at enhancing



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environmental and social development performance. To date, more than 150 top executives from extractive and manufacturing companies from across the globe responded.

The results indicated that the two greatest threats to improving performance in environmental and social management include an inability to create a clear business case for such initiatives, as well as the lack of appropriate resources – human, financial and natural – required to implement. Additionally, the major challenges in mobilizing companies to address sustainability challenges and opportunities were identified as a lack of strong leadership and an appropriate corporate culture conducive to improvement.

This data corroborates our firsthand experience in working with companies to improve in such areas. Despite the existence of a strong desire to improve and a clear mandate from consumers, companies still struggle to demonstrate the business value of such initiatives. Further, they have difficulty implementing and sustaining progress, largely due to a lack of resources. As such, at DuPont Sustainable Solutions, we maintain that leaders must invest sufficient time and resources to develop comprehensive, data-driven management systems to streamline environmental and social performance, reduce risk and generate additional profit.

Voyager Plant Optimization Helps AB InBev Reach Global Environmental Goals

In March 2013, Anheuser-Busch InBev (AB InBev) announced that it had met or surpassed every one of its three-year global environmental goals set in 2009.



Bert Share

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This included:

- » **Achieving a leading-edge water-use rate of 3.5 hectoliters of water per hectoliter of production, representing an 18.6% reduction in water usage globally against a 2009 baseline.**
- » **Decreasing energy use per hectoliter in breweries and soft drink facilities worldwide by 12%, surpassing the original three-year target of a 10% reduction.**
- » **Reducing carbon emissions by 15.7%, surpassing the original three-year target of reducing emissions by 10%.**
- » **Increasing recycling rate to 99.2% for solid waste and byproducts, passing the original three-year target of achieving a 99% recycling rate.**

These goals were designed to challenge 150,000 colleagues across 130 breweries and soft drink facilities to look closely at every facet of the company's operations in search of ways to improve performance. But the company, which operates under a philosophy of always striving for improvement, went a step further. Every one of the company's breweries, soft drink facilities and Zones were given rigorous metrics and targets, to encourage behavioral change that could have a major impact.

These achievements were driven by Voyager Plant Optimization (VPO), the company's operational management system, which standardizes AB InBev's operations around the globe. VPO puts behavioral change towards greater efficiency at its very core and encourages each colleague – at every level and across all geographies – to integrate standards into their daily routines. These standards ensured that AB InBev could take a multi-faceted approach to change that included a mix of operational changes, technological solutions, partnerships and more. This led to significant innovation and performance improvement across the company.

VPO puts in place monthly reporting and ranking of performance, regular team calls, annual meetings to share and develop new ideas, and a database cataloguing more than 700 best practices, all of which were instrumental in pushing AB InBev to meet its global environmental goals. For instance, under VPO, AB InBev's team in China was able to achieve the company's largest region-wide reduction in water and energy consumption between 2009 and 2012 (38%

and 30% respectively) by implementing initiatives from other regions. The China team's success – such as its method to continuously benchmark utilities usage between brewery departments by drilling down into energy and water data – has been adopted by other regions.

But VPO did not only act as an operational framework, it also served as an innovation catalyst, bringing colleagues across the globe together. For example, when AB InBev's brewery in Ningbo, China, wanted to reduce its water use, they adopted best practices from the company's brewery in Cartersville, Georgia, which had previously reduced its water use in response to a severe drought. As a result of the changes, Ningbo was able to reach the company's global target for water use at the time (3.5 hl of water per hl of production) a full year ahead of schedule.

In June 2013, AB InBev announced a new set of five-year global environmental goals, which challenge all colleagues to continue making operational efficiency improvements and reducing supply chain impacts. By integrating sustainability into VPO and other management systems, AB InBev is able to ensure that each colleague around the world is always on the lookout for ways to reduce their individual environmental impact as a normal part of business. It also ensures that AB InBev is continuously reducing the company-wide impact by finding and implementing best practices across the value chain.

The Story of Sustainable Industry

Sweco is a Swedish based consultancy company with focus on developing total solutions that contribute to the creation of a sustainable society. Sweco works with a broad range of customers including municipalities and regions as well as private and public companies.



Monika Bubholz

Sustainability Consultant,
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In 2012 Sweco's consultants working towards different industries (mining, refinery, pulp and paper etc) started a process to define and make the word "sustainability" more hands-on in their daily work. The engineers working with constructing factories had up to this point regarded sustainability as somewhat fuzzy or something that was not part of their business. To incorporate Sweco's overall mission "Sustainable Engineering and Design" into these engineers' daily work was one of the main reasons to launch the concept of "Sustainable Industry." This would increase the engineers' understanding of their importance and skills to create a sustainable society.

Some years earlier, Sweco's Engineers and Architects had been deeply involved in the concept "SymbioCity" – a city which uses its resources in a sustainable matter as well as contributes to favorable economic and social impacts. Inspired by this, Sweco's industry consultants started to think of the sustainable industry – how would the perfect sustainable factory be constructed if any means were possible.

By working in groups, each of the 200 engineers contributed with their skills and ideas to form and define what a sustainable industry is. Their work was structured according to eight aspects: Strategy, Employee, Location, Building, Production Process, Energy, Emissions and Environment. Each aspect was filled with content and ideas on how sustainability could be incorporated to make the factory more sustainable.

As a result of their work, Sweco has gained a large amount of actions that are to be used as possible activities or services to make a factory more sustainable. The activities are hands-on measures that different industries can use to either start their work in making its business more sustainable, but that also can guide companies that have reached far concerning sustainability and inspire what the next step could be to transform into a more sustainable business model. As the concept Sustainable Industry is divided into eight different aspects, the concept is methodical and gives structure to the overwhelming question of where to start and what to do next when working with sustainability issues.

Based on our knowledge, the concept is the first method that investigates in a structured and hands-on method what different industries can do to act in a more sustainable way, from choosing the right valve for the process to risk analysis, from structured dialogue with suppliers to strategic decisions at management level.

Based on this process of conceptualizing Sustainable Industry, Sweco's engineers are now much more confident regarding sustainability and have the knowledge of where they can make an impact to create a more sustainable industry. Sweco has also received attention from different industries and branch organizations in supporting our member companies to start working with sustainability issues. As a bonus, Sweco has received many job applications from students, interested in working with sustainability from an industrial point of view.

Research: Young Sustainability Managers Becoming Key to Environmental Success

A decade ago, sustainability managers were a rare breed. With the release of the Brundtland Report in 1987, which defined sustainable development and the actions required for achieving it, companies began to employ managers to focus on environmental responsibility.



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www.sustainabilityatwork.com.au

However, in the last ten years, sustainability has moved from focusing solely on environmental impacts to becoming a social concern, as the social benefits of being and being seen to be

“green” have gained momentum. At the same time the business case for sustainability has been established and the growth of sustainability as a profession has been supported by the widespread introduction of voluntary and mandatory sustainability reporting.

So who is the sustainability manager of today and what is expected of them? Where do they fit in the organization? What challenges are they facing and what successes have they achieved? More importantly, what does the future hold?

Three Typical Sustainability Managers

In 2012 we conducted a national study into “The Australian Sustainability Manager – The role, the challenges, the future.” We found three typical Sustainability Managers:

- 1. THE EXPERIENCED ENVIRONMENTAL MANAGER:** holds a science or trade qualification; moved into sustainability from environment role; is focused risk management and reporting; has 10-20 years experience; and runs their own unit of between 2-5 people. This Experienced Environmental Manager is focused on the environmental outcomes and tried to remove or avoid the human or communication element.
- 2. THE SUSTAINABILITY SPECIALIST:** holds a communications, HR or Business-related degree with a second qualification in sustainability or environment; this is their second or third sustainability role; 3-10 years experience; working in a sustainability leading organization; well-connected to CEO or executive; and manages a small team. This Sustainability Specialist is often high-profile and well-supported by executive and stakeholders. They are also better at communicating sustainability but spend more time reporting and engaging stakeholders.
- 3. OPTIMISTIC NEWCOMER:** typically has a BA (may hold environmental or sustainability qualifications) in a business-related area; first sustainability role; 1-2 years experience; working in isolation, as a team of one; and reporting to a variety of middle-managers from HR, Corporate Communications, Property, Finance and Training. This group were seen to be responsible for major environmental goals, but without the know-how on how to get things done in large companies, they saw themselves as battling to get sustainability onto the agenda and keep it there. They were largely inexperienced in understanding internal corporate communication processes and often did not have executive or CEO support.

Having just conducted a follow up review, the Experienced Environment Manager and the Sustainability Manager are continuing along the trajectory identified in the 2012 research, kicking goals with their sustainability reports, driving improved environmental performance and negotiating transparent relationships with their supply chain.

But the group where there was significant change was for the Optimistic Newcomer. And the feature that most typified them was their dogged resilience. What led to this change was two-

fold: their impressive ability to link and influence within their organizations to achieve results for key environmental projects and their ability to outlast their CEO and the blocking from executive.

The research clearly reinforced the fact that a CEO who supports a sustainable approach to business is directly linked to the success of the sustainability programs. Many Optimistic Newcomers are now kicking major goals in organizations that before this were lagging behind.

Typifying the Optimistic Newcomer's sustainability approach was a strong link to internal sustainability programs. This group has learned from their initial mistakes and has worked hard to establish trust across business units and across the workforce. Engagement programs are entrenched, as is reporting systems and communication.

Unlike before, in 2014 there was very little frustration expressed. This group is energetic. They have the support of management and are street savvy enough now to know that keeping this relationship healthy and open is going to be key to the environmental success of their organization.

Opportunities Arise from Considering the Environment as Means for Economic Growth

Over the past five years, financial institutions have demonstrated environmental leadership through reducing their environmental footprint, advancing green building practices and engaging employees and communities.



Karen Clarke-Whistler

Chief Environment Officer,
TD Bank Group
www.td.com

While “walking the talk” is fundamental to gaining credibility, the reality is that the environmental issues that are most material to a financial institution are those that link the environment and the economy. In 2013, TD decided to investigate this relationship in more detail through our TD Economics team.

The relationship between the environment and the economy has been the subject of debate for more than 20 years. It's often assumed that protecting the environment comes at the cost of economic growth. Our research examined the opportunities that arise from considering the environment as an enabler of economic growth.

Developing a Definition

First we needed to develop a working definition of the “green economy.” Most current definitions refer to renewables or clean technology sub-sectors. These narrow definitions can diminish the real progress that industry, government and citizens have made. We developed a more holistic

systems-based definition that considers the ‘greening of the economy’ as a progressive process that is occurring throughout the economy: The aggregation of consumer, corporate and policy efforts to increase operational efficiency and minimize environmental impact while fostering economic growth, diversification and competition.

Performance Framework

Next we developed a framework – or system – that could be applied across industry sectors to measure the “greening” process. The framework is based on the three main factors that shape greening efforts:

- » **Government environmental policy – the set of policies that place appropriate constraints on economic activity, reflecting the fact that environmental considerations are not reflected in market prices**
- » **Environmental and economic efficiency – the mechanism through which economic and environmental decisions are made and how the impacts of those decisions are measured**
- » **Corporate responsibility – market conditions and motivating factors that shape business actions beyond those related to economic efficiency**

We applied this framework to a number of industrial sectors and to the municipal sector and found that the greening process is typically a sequential four step process, including regulatory compliance, managing operational efficiency, greening the supply chain, and new products and services.

Results

The level of involvement by industry varies by sector-specific market conditions, consumer demand, corporate support and economic feasibility. Cost may be a prohibitive factor in implementing these strategies, with each step more expensive than the last. The two most expensive steps – greening the supply chain and implementing new products and services — are unique since they have the potential for creating a virtuous cycle which fosters greening in other companies or industries that would not have otherwise existed. When we applied the greening framework to a municipality – New York City – we found that cities play a crucial role in the greening of the economy. In NYC the innovative approach of integrating environmental elements into solutions for urban development issues has improved environmental conditions, increased property values, cut costs, created jobs, improved public health and enhanced the quality of life. Moreover, NYC has demonstrated that by combining policy tools, municipal policy-makers can create conditions where market forces motivate the greening of the economy.

The Bottom Line

Once we accepted a broader perspective on the “greening” of the economy, several trends became apparent:

- » **Environmental considerations are increasingly embedded into corporate decision making**
- » **Improving environmental efficiency frequently results in cost advantages**
- » **Incentives to reduce environmental impact can be a strong driver of innovation**
- » **Corporate responsibility is a driver for improving environmental performance**

We need to stop thinking of “a” green economy or “the” green economy and start thinking in terms of the “greening” of the economy. A more encompassing definition and an appropriate framework for analyzing performance reveals that more progress is being made than popular opinion might believe. We need to be careful not to diminish the progress industry, government and citizens have made. It is our hope that by changing the way we think about the relationship between the environment and the economy, we can motivate further thought about the opportunities to foster economic growth while preserving environmental integrity, thereby creating a brighter, cleaner future.

Volunteer Organization Fosters Environmentally Conscious Healthcare Facilities

In 2013, Maryland Hospitals for a Healthy Environment (MD H2E), in partnership with the Maryland Health Care Sustainability Leadership Council (HCSLC),



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conducted an online survey of hospitals across Maryland to assess how many hospitals were planning and/or implementing environmental sustainability programs. Thirty-six out of 60 eligible hospitals completed the survey, including: two academic medical hospitals, three state psychiatric hospitals, one federal facility, and 30 community hospitals.

MD H2E is a grant-funded initiative of the University of Maryland School of Medicine and strives to create a culture of environmental health and sustainability in Maryland’s health care community. Since 2005, MD H2E has provided technical assistance, education, networking, and recognition for Maryland’s health care providers. At the onset of the MD H2E program, staff made the following observations:

- » **No hospitals in Maryland had a green team or a sustainability mission statement**
- » **More than a dozen Maryland hospitals were entered in long-term contracts with a medical waste treatment company that provided financial disincentive for prevention and recycling. Few hospitals were recycling batteries, electronics, and other exceptional wastes**
- » **Green cleaning, integrated pest management, and environmentally preferred purchasing, were unfamiliar terms among hospital directors**
- » **There were no hospital farmer's markets**

In 2011, MD H2E facilitated the launch of the Maryland Health Care Sustainability Leadership Council (HCSLC), a volunteer organization comprised of health care providers who are leading environmental sustainability efforts across Maryland's hospitals and health care facilities. The mission of the HCSLC is to foster environmentally conscious health care facilities that engage, educate, inspire and advocate for social responsibility in their leaders, employees, patients, and the wider community.

The HCSLC and MD H2E developed a series of questions for hospitals to respond to regarding practices of environmental sustainability. Respondents were given the option of answering each question with a) not at the current time, b) planning, c) currently implementing, and d) best management practice.

Results

LEADERSHIP: 75% of hospitals have Green Teams which have the support of at least one executive, and are at the very least, in the planning stages in having a sustainability mission statement, and plan in place.

PURCHASING: 78% of hospitals surveyed have converted to reusable sharps containers. Additionally, 66% of hospitals are in the planning stages or greater in converting to purchasing DEHP/PVC free products. However, 86% of hospitals surveyed are not currently utilizing, or have plans to use, environmental scorecards. 67% of hospitals surveyed are not using EPEAT.

WASTE MANAGEMENT: This is an area of high achievement for a majority of hospitals that responded: 94% of hospitals track the disposal of solid waste, regulated medical waste (RMW), recycling, and hazardous waste; 88% of hospitals have a RMW reduction program; 97% of hospitals segregate hazardous pharmaceutical waste and 88% recycle bottles and cans.

TOXICS REDUCTION: Hospitals show great areas of achievement in toxics reduction: 94% have virtually eliminated mercury; 86% are switching to microfiber mops; and 78% are employing integrated pest management. The use of green cleaning techniques is an area of opportunity, with only about half of responding hospitals reporting at least three quarters of their cleaning products as "green."

ENERGY CONSERVATION: Most hospitals are participating in energy conservation measures. Two-thirds are tracking energy through the Energy Star Portfolio; two-thirds have or will be installing LED Lighting and 85% have or will be conducting energy audits. Only half have implemented staff driven education initiatives regarding energy conservation.

UTILITY MANAGEMENT: This area offers great opportunity, including tracking reductions in the carbon footprint and utilizing alternative energies, neither of which was largely being implemented with surveyed hospitals.

GREEN BUILDING: As the category requiring the largest investment, 65% of hospitals surveyed do not currently have a LEED certified building and 75% do not have a green roof.

TRANSPORTATION: More than 60% do not provide reduced cost bus or offer carpooling incentives or preferential parking for hybrid/electric cars.

WATER CONSERVATION: More than 71% of hospitals have or are planning to install low flow water fixtures, but fewer (less than half) have or will be conducting water audits.

FOOD SERVICES: 68% of hospitals are increasing their purchase of foods from local farmers. 66% are on their way to adapting a sustainability foods policy. Reduction of sugar sweetened beverages and the installation of a vegetable or herb garden on premises seems to be an area poised for growth.

MD H2E and the HCSLC used the results of this survey to target educational efforts. A follow up survey is planned for 2014.

Environmental Stretch Goals that Will Delight Even Your CFO

Why would any sane business leader knowingly and willingly set a “Big Hairy Audacious Goal” (aka BHAG) and broadcast it to the world? Those of us with a sustainability or communications

background intuitively understand the value. That view, though, may not be shared by your CFO, legal counsel and other members of the executive team.

How, then, do you set environmental stretch goals that will win even your CFO’s approval? Let’s start with the reasons why companies set environmental targets. First, publicly stating what you aim to achieve demonstrates commitment. That commitment helps position your company as a good corporate citizen – showing that you’re not just about profits, but also about being



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responsible. This in turn builds credibility and trust with your company's many stakeholders – customers, investors, NGOs, government leaders, and your own employees. In fact, setting aspirational environmental goals engages your employees in helping to achieve the targets. By proactively setting goals, you send a positive message to shareholders which can avert or minimize the increasingly-popular shareholder resolutions on this topic. And proactively reducing your company's footprint is the right thing to do.

There are two dangers in setting environmental goals. One, you set them too high and potentially put your company at risk of not achieving them. Two, you set the bar too low and they become meaningless or, worse, you are accused of sandbagging or green washing. It's definitely a balancing act.

Some Lessons I've Learned About Setting Environmental Goals

- 1. LESS IS DEFINITELY BETTER.** One or two signature goals that are both inspirational and aspirational are far better than a dozen operational goals.
- 2. MAKE SURE THEY SHARE COMMON TIME HORIZONS AND END DATES** – such as “by the end of 2020, 100% of our products will use recycled content.”
- 3. ALIGN AROUND COMMON MEASURES** whether metric tons, million pounds, kilowatts, consumption, cost savings, etc. Specify whether the goal is cumulative or annual. If your goal includes a reduction, be clear whether it is a percentage absolute reduction or an intensity reduction from a prior year benchmark. Mixing and matching tends to confuse.
- 4. HAVE A CLEAR ROADMAP** for how each environmental goal will be achieved. This includes establishing a baseline, annual targets and goals for each priority area.
- 5. IDENTIFY THE INTERNAL EXECUTIVE SPONSOR & ORGANIZATIONAL GROUP** accountable for execution and tracking of the goal. This will avoid finger pointing should Greenpeace appear on your rooftop!
- 6. ONCE YOU'VE DRAFTED YOUR GOALS, ASSESS THE LEVEL OF RISK** they present to your company – low, medium or high. You'll want to work closely with both your finance and legal departments to ensure they are comfortable with the targets, risk and rewards.
- 7. ESTABLISH RIGOROUS DATA REQUIREMENTS** for each new goal. This should include objective, context, goal definition, owner, executive sign-off, assessment of risk, and announcement plan. Spelling it out in black and white helps ensure all parties are on board and there is no misunderstanding.
- 8. VALIDATE YOUR NEW ENVIRONMENTAL TARGETS** with a few trusted NGOs once you have internal buy-in and sign-off.

9. MAKE SURE YOU REPORT OUT ON THE STATUS OF ALL ENVIRONMENTAL GOALS on a regular basis – quarterly or at a minimum annually. Highlight which goals are on track, at risk and behind, and any corrective action plans.

10. DON'T FORGET TO INCLUDE YOUR GOALS AND TRACTION in the sustainability section of your company's Global Citizenship Report.

By applying the same rigor to environmental goal setting as you would to any other business goal, you help elevate sustainability to that of a true business function – and that's a good thing.

Tips to Getting Green Private Investment

There is no shortage of good projects, nor of money. To get green private investment, it's all in the communication.



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A recurring storyline in the fight against global warming is that climate-friendly technologies have slow adoption in developing countries. The Climate Technology Initiative (CTI) sponsored a series of workshops and consultations with the relevant private and public sector players that led to the conclusion that there was not a shortage of private sector investment, and there was not a shortage of good projects. Instead, there was a shortage of good project financing proposals capable of communicating the merits of such projects to the international finance community.

To help any (potential) entrepreneur pitching for this type of private investment, here are some potential practical tips they may consider:

Investors' preoccupations essentially revolve around assurance, that is, whether the entrepreneurs allay their fears and reassure them that things will be okay and will be handled with maturity. Investors want assurance that: their money is in good hands (hence questions on who is in the team); there is a way out for them when things go bad (questions on exit scenarios); and they will indeed get some financial returns on top of the social and environmental advantages the projects will bring.

Some of Their More Frequently Asked Questions

FINANCIALS - Who is paying for that? Where is the revenue coming from? Why would they pay for it to be recovered if they can currently discard it for free? How appropriate/relevant is external financing for your project? Can you explain the working capital cycle? Can you describe the most important drivers for your margins? I want details on your thinking regarding the financing of the

project. How did you come up with these figures? How did you set the price of your product? Explain how the investor can get guarantee of returns. How does he gain in a bad year? What are the 2nd/3rd phases of financing? What is your cost breakdown? What proportion goes for what? It doesn't look that the revenue stream is viable. Have you looked elsewhere?

TEAMS - What experience does your team have in managing (this sector)?

OPERATIONS - Can you run through the operational challenges that you'll face for me? What will you offer to the investor when things are going badly? Is there some limitation on the amount of your product your customers will buy? What mechanisms do you have to lock in the customers? How are you securing your feedstock? How do you convert a letter of interest into something sustainable? How do you firm it up, within the laws of the country?

STRATEGY - Take me through your assumptions you made. What regulatory risks are you tackling? What's the profile of your customer base? Have you approached any potential investor? Why/Why not? What have you done to get longer term agreements? In your expansion plan, you talk little about risk and competition. What else can get in your way? What's the reason for picking these locations? How did you come up with the size of the project?

Presenters must handle Q&As like this effectively. Listen to what is being asked, instead of what has been asked (i.e. check the intention). Answer that specific question, nothing else. Give a succinct answer, not an essay. Close quickly and nicely, e.g. "I hope this answers your question," or "I'm happy to elaborate after the presentation if you wish." Investors do not want your and their time wasted.

There is no shortage of good projects with great impact. There is enough money around for good projects. It is about communicating the merits of such projects to the international finance community in a proper way that matters. The above questions and tips may help the entrepreneur in being relevant and communicating what's needed and convincingly.

It would be a pity if these projects do not see the light of the day and if available money gets unused when demand is high.

After Merger, Company Consolidates 70 Legacy Software Systems

Lexicon Systems LLC led a team of 40 stakeholders through a fast-track software selection, saving months of effort and \$1 million. Two large companies merged to form a world-scale chemical company. The new



Anonymous

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company had over seventy legacy environment, health & safety (EHS) systems and planned to consolidate information into a single "system of record." Merger contracts allowed one year to sunset several large software applications.

First, Lexicon Systems developed a framework for a streamlined, enterprise-side EH&S management information system. We developed a set of consensus business requirements and standardized business processes across three legacy businesses. This comprehensive initiative involved fifteen business processes such as multimedia emissions management; task, incident and audit management; industrial hygiene, medical information, safety data sheet and process safety management.

Then we reviewed the seventy legacy systems, including homegrown, custom-built and commercial software and countless spreadsheets. We identified the gaps between the business requirements and existing software. Lexicon Systems worked with Information Systems and EHS groups and recommended whether to keep, replace, or migrate data from the most critical EHS management information systems.

Once the team documented business needs and feature/function gaps, Lexicon Systems executed the software evaluation and selection process. Our methodology leveled the playing field among potential software vendors by setting objective software and vendor selection criteria. Lexicon Systems arranged a series of conference calls, software demos and vendor presentations. Considering the previously established selection criteria, Lexicon Systems prepared a Request for Proposal framework for the client's procurement group to send to a "short list" of vendors. With proposals in hand, stakeholders scored the prospective software vendors/applications and selected the vendor for the EHS "system of record." Time constraints required parallel implementation of a secondary system for safety data sheet management.

Lexicon Systems completed this complex scope of work on schedule, allowing for a rapid implementation start. The client was able to:

- » **Effectively navigate the software life cycle, condensing the schedule;**
- » **Rapidly gain stakeholder consensus on business requirements and software vendors;**
- » **Gain valuable insights regarding implementation strategy;**
- » **Save months of effort and about \$1 million in license and implementation costs.**

The software implementation team deployed the most critical systems within the sunset date in the merger agreement. Additional implementation phases are in progress.

How Much is Your Sustainability Team Worth?

So often, we see our clients establishing a sustainability team (or person) that is underfunded and often lacking the necessary experience. This is surprising when you consider how important sustainability is becoming to investors, consumers, media and employees and how its reputation can benefit.



Chris Lindley

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But what about the money? Money talks. When planning a new sustainability initiative, do what you can to give that initiative a realistic dollar value to the business. In some cases, this will be relatively easy. Energy or water conservation projects, for example, involve comparing your bills before and after. When investing in new technology such as video conferencing facilities you would measure its impact on business travel: flights, taxis and hotel stays, to name a few, remembering to take in to account the cost of the technology.

Some projects have a less tangible value, like an educational program or community clean-up program. But they have a value nonetheless. Do your research and find out how to establish that value. Others have done it before you and the information is out there.

Sell your initiatives to the business. Ideally, present each initiative as a one-page business plan showing the cost, its expected return on investment and a project team or sponsor so there is accountability. Use this one-pager to socialize your initiative with the decision makers. Be sure to highlight all the various value propositions of the project that appeal to the different business functions.

Then set up a dashboard or summary page to give you a total value of all sustainability initiatives company-wide.

You will find that this process gives you the confidence and the conviction to succeed in your role and ultimately to convince the business that sustainability has its place. And don't be afraid to contact other sustainability managers out there for their advice. This can be an emotive subject and there's a lot of goodwill out there.

The Climate Adaptation Gap

Recent data indicates that a gap exists between corporations understanding the big-picture risks of climate change and their actions to address those risks to shore up their bottom line.



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MIT's Sloan Management Review published results of the annual sustainability survey they conduct with BCG (Boston Consulting Group). In Harvard Business Review's synthesis, they note "the vast majority of respondents in a new Sloan and BCG survey say climate change isn't a significant issue ... And of the 27 percent that acknowledge climate change is a risk to their businesses, only 9% say their companies are prepared for the risk."

In contrast this data with another corporate survey, the World Economic Forum's Global Risk Report. This year, 4 out of top 10 global risks derived from World Economic Forum's global risk perception survey relate to climate disruption:

- » **Water crisis (#3)**
- » **Failure of Climate Change Mitigation and Adaptation (#5)**
- » **Greater Incidence of Extreme Weather Events (#6)**
- » **Food Crisis (#8)**

These risks share space with other risks such as high unemployment, fiscal crisis and political and social instability but they diverge from MIT's data, which shows that respondents do not see climate change is a significant issue. So, based on the WEF numbers, corporations see a risk, but, based on the MIT numbers, they do nothing about it; that gap suggests that businesses are not yet sure how to manage the risk that changed climate brings to their value chains.

Five Step Plan of Adaptation Action

Since climate adaptation relates to the direct impacts on our most important assets – our employees, our customers our communities and our families - those who advise corporations possess a great opportunity to demonstrate to their clients the significant collateral benefits of a five step plan of adaptation action:

- 1. EXAMINE** the relative risks of geographies in your supply chains.
- 2. IDENTIFY** relevant vulnerabilities in geographies where you maintain significant human and capital assets.
- 3. REVIEW** your business-continuity plans based upon these vulnerabilities and risks, perhaps including an economic risk analysis for the most likely issues.
- 4. LIST** strategies that could be used to prepare your most vulnerable assets.
- 5. CREATE** a short and medium-term plan that starts with adaptive actions you already are taking as part of your business as usual and sets priorities of adaptations with collateral benefits – e.g., mitigating greenhouse gas emissions (onsite stormwater management), improving employee morale (work from home options) or buoying your reputation (shoring up public health systems in one of your supplier hubs). The plan should include financials for

avoided risks. Many cities, including Toronto, New York and London publish their adaptation plans, and they are worth a look for inspiration.

Applied Innovation Programs

While principles underlying a design-based approach to innovation are becoming more widely adopted inside many corporations, they need

to be more readily embraced in the CSR/sustainability function. In particular, firms need to build the capacity for experimentation, applying lean startup methods and the notion of rapid iteration in developing solutions.

In running applied innovation projects through the business school at UC Berkeley, I often see our corporate partners (and students) struggle with how to test “out of the box ideas,” or even simply gain traction for them internally. To combat this, we have introduced the concept of the “\$100 experiment,” where we challenge our project teams to learn as much as they can about a proposed innovation/solution while spending \$100 or less.

"One of the most impactful sustainability decisions a firm can make is to remove the barriers to experimentation.



Dave Rochlin

Executive Director, Applied Innovation,
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David Kelly at IDEO often repeats Linus Pauling's quote that “the best way to have a good idea is to have a lot of ideas.” Through rapid and low cost experimentation, it's possible to create a robust portfolio of possible concepts and solutions. This is more likely to solve large and often ambiguous issues relating to sustainability than going cautiously “all in” on one single solution. So developing this capacity is a key tactic for environmental leadership.

As an example: One of the firms I've worked with through ClimatePath is installing EV chargers in their parking structure in response to growing demand for plug in vehicles support. But their offices are close to the regional light rail system (BART), and they could almost certainly impact their footprint more by getting their employees out of their cars and onto

BART. There are dozens of potential tactics for achieving this. But this has created ambiguity/uncertainty about how to pursue programs in this area, while EV charging stations are a well-understood initiative. They need to avoid framing the decision as “should we support EVs or

subsidize BART commuters?” since they understand the former and not the latter. It’s not an either/or question, but their mindset has historically been to select programs to implement, rather than run multiple tests to learn.

I see parallels to this in the growing inclination of firms to tie up with a single NGO when confronted with a tough issue, rather than running multiple pilots with several to allow the best ideas to emerge. There are clearly issues to be resolved in this approach. Since it is sometimes referred to as “failing fast to learn,” the emphasis needs to be on the learning vs. failing piece, which can run counter to company culture. Successful pilots also need to have a bridge to implementation, and firms need executional bandwidth. Finally, there is the ever-present danger to reputational risk to be considered.

But firms inadvertently create larger pass/fail models of sustainability when they are unable to experiment. One of the most impactful sustainability decisions a firm can make is to remove the barriers to experimentation. Creating a culture that can encourage ideas and apply lean/learning methods is needed for firms that are serious about environmental leadership.

In Low-investment Capital Environment, CPCs Lead the Way

In 2013 more and more Consumer Product Companies (CPC) are now disclosing their supply chain opportunities and improvement strategies in their organization’s



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public 10K Statement, Annual Report or Annual Sustainability Report. It is clear that this disclosure trend is necessary and a first step toward a global sustainable supply chain.

The challenge is the next step: creating value that has a positive impact on the P&L and meets the US Security Exchange Commission (SEC) climate change risk reporting rule requirement. Today’s sustainable supply chains can be generated value in several ways: improved sales coordination, better supply and demand planning and optimized operations. These common supply chain processes may not sound elegant or elaborate but the secret sauce toward reduced CPC GHG, Scope 3 greenhouse gas emissions is an improved connection from the consumer to CPC, retailer to ending with the consumer. The planned output is improved business operations, lower waste and reduced greenhouse gas emissions.

Where’s the synthesis? In a low investment capital environment leading CPCs are focusing on sales, factory and distribution center floor activity as well as the logistics network and supply

management strategies from a sustainability point of view. Following an education and language translation period the return on investment opportunities are boundless.

Lessons Learned from Our First CSR Report

Being asked to create our first CSR report was exciting – after all, it would be our opportunity to showcase our sustainability journey over the past five years. This report would be our tool to raise awareness with our stakeholders, both customers and associates.



Susan D'Souza

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At first I thought this would be easy, but soon learned there was more than meets the eye. If done correctly, the report can be a highly effective way for our company to demonstrate our strong commitment to sustainability and report on our successes and challenges we encountered along the way.

In order to harness the power of your CSR report, I believe you must consider the following 5 things:

- 1. GOALS** – when setting these be sure to articulate baselines and targets, be transparent and hold yourself accountable. Be sure goals you set are cautiously optimistic but attainable. It is important to discuss key challenges encountered in meeting these goals and state your action plan for addressing them. Remember to ensure all employees know what these goals are. After all, increasing employee awareness will enable them to better understand how they contribute to company goals and as a result they are better engaged. In order to achieve credibility, you must track your progress and if possible utilize third party validation. It is crucial to set goals for the future. A CSR report with no clear goals for the future, is like a ship with no compass. In order to get your customers and employees on board, you must steer them to where you are headed.
- 2. ENGAGING** – A significant amount of time is invested to deliver a good CSR report so obviously you want it to be read from front to back. Engaging your stakeholders (employees and customers) is vital, so you must learn what is important to them and why they are interested or impacted by your business. Engagement raises brand awareness, offers valuable insights and perspectives from key stakeholders and motivates others to take action.
- 3. INTERACTIVE** – Make your report easy to find and engaging to read. How many clicks does it take to find your report on line? Can it be easily read without printing it out? The

next wave of reports are those that are interactive, online reports. We use an interactive sustainability reporting tool, where each click enables the reader to drill down and obtain more information if they so desire. It is very user friendly and intuitive. From all the CSR reports I have researched, I believe the best reports are just long enough to be credible and short enough to be readable. In this case, less is more.

4. **KEEP IT REAL** – Don't stretch the truth. CSR success is dependent upon tangible results. The last thing you want is to be accused of green washing. It is important to be transparent as this coupled with clear communication builds trust and credibility with your stakeholders.
5. **MANY DECISIONS** – You need to decide many aspects of your report up front: Report format in print, pdf or online or a combination of all three? Reporting period? Structure, scope, style, design layout, length and frequency? Many things to be decided upon and not always easy decisions to make, especially if you need to get consensus amongst your team members. You cannot please everyone all the time, nor should you! Obtaining feedback from your team and stakeholders is important, however in the final analysis follow your gut instinct on what you perceive to be the best way to communicate your company's sustainability message.

Never be complacent; raise the bar to drive further progress. Complacency leads to extinction. Sustainability reporting can position you as a leader and be a source of competitive advantage. The key to implementing a successful strategy is to ensure executive buy-in, collaborate with your external partners (customers and suppliers) and leverage employee engagement to maximize the results of your initiatives.

Creating Customers for Life

"If you sell something, you make a customer today. But if you help someone, you create a customer for life."



Susan D'Souza

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This is the principle we follow at our company. Helping to educate our customers on environmentally friendly choices so they can reduce their environmental footprint, truly understanding their needs, and forging partnerships with them on common initiatives is our way to solidify the bond and move from a transactional relationship to a long term one.

I believe that partnerships are a way of harnessing skills and knowledge. Whenever I have accompanied our sales teams on a customer visit, I always am looking for ways for us to leverage our sustainability efforts where the community and environment are the winners and advance

both our businesses as well. There is a saying I once heard that is so true when it comes to partnerships: If you want to go fast, then go alone. If you want to go far, then go together.

This affirms my belief that customer and supplier partnerships are the way to go. Many partnerships we have built have been where sustainability has been the foundation of the relationship. We treat every customer as if they are going to be our customer for life. By treating customers with respect and being genuine in trying to determine the best way to serve them, we gain their loyalty. By going above and beyond the usual, we raise the bar high in not only meeting but exceeding customer expectations. It's not about the transactional purchase but instead it is about nurturing the customer relationship.

A vital element in securing lifelong customer loyalty is about really listening to your customer needs and understanding what they want. Profits are no doubt important, but ensuring your customers are long term will in turn result in a profitable bottom line. After all keeping them part of the process can engage them in more ways than one. We actively solicit feedback from our customers and ask for their opinions. This has been part of our effective strategy to win long-term clientele.

Retaining customers for life requires constant, ongoing commitment but if done wholeheartedly, the payoff is priceless. Leveraging sustainability to enhance customer partnerships has proven for us to be very rewarding resulting in win – win scenarios.

ENERGY MANAGEMENT

Benchmarking and Disclosure: A Boston Case Study for Collaboration between Cities and the Private Sector

Boston's Climate Action Plan committed the City of Boston to implementing a building energy benchmarking and disclosure policy as part of its comprehensive strategy to reduce greenhouse gas emissions 25% by 2020. Such a policy can have a significant impact within the commercial real estate sector both intended and unintended. To ensure that Boston's ordinance was both sound public policy and not a burden to the private sector, the City worked with A Better City (ABC) - a Boston-based nonprofit organization that represents the interests of the business and institutional community on issues of transportation, land develop and the environment - to solicit stakeholder feedback on potential policy options. ABC conducted research on best practices from existing benchmarking and disclosure programs from other leading cities to inform this process.



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Lessons from Leading Cities

At the time of this research, building owners in NYC, Seattle, San Francisco, Austin and Washington, DC, were already being required to report their building energy use. Municipalities were then disclosing the energy performance of reporting properties, creating market transparency to drive building owners to improve the energy performance of their properties.

Key features and lessons learned from these cities were gathered to inform the development of regulations in the City of Boston. Key lessons learned included:

- » **Allowing adequate time for policy development, rulemaking, and compliance before the first mandatory reporting deadline;**
- » **Leveraging assistance from outside organizations to assist with program outreach and education;**

- » **Using existing, no-cost software such as EPA's Portfolio Manager and the DOE's Standard Energy Efficiency Database Platform to minimize implementation costs;**
- » **Gaining an in-depth understanding of the City's building stock before implementing any policy;**
- » **Engaging utility partners for assistance with data reporting and automated benchmarking services.**

Applying Lessons to Boston

During the ordinance development process, ABC worked closely with the City to solicit direct stakeholder feedback to ensure that this new program was implemented in a way that is not needlessly onerous or overly intrusive. As part of ABC's ongoing work with the Boston commercial real estate community, we convened focus groups in the fall of 2012 to better understand the perspective of building owners and property managers regarding this proposed policy. This stakeholder process led the City to adapt its proposed ordinance in a number of ways including adjusting enforcement mechanisms and the inclusion of public facing information about green building characteristics. ABC also provided testimony in support of the ordinance and worked closely with several of its members to ensure private sector support for the City's efforts. In 2013 the City of Boston enacted BERDO.

BERDO Compliance Reporting

ABC's Challenge for Sustainability is a voluntary environmental program that works with Boston's commercial real estate sector to meet a broad range of sustainability standards and practices. The program currently serves around 100 facilities representing over 35 million square feet of space. With the passage of BERDO, ABC incorporated changes into the Challenge scorecard to enable participants the ability to comply with BERDO reporting through direct uploading of data from their scorecard into Portfolio Manager. These changes have allowed BERDO reporting to be as streamlined as possible for Challenge participants.

The collaborative effort between ABC and the City of Boston led to the development of a building energy disclosure program that was well tailored to the needs of the Boston commercial real estate sector and informed by current US best practices.

Virtual Energy Assessments: An Emerging Technology to Understand Building Energy Use and Opportunities

Remote or virtual energy assessments are an emerging technology that provides building owners with a greater understanding of their building's energy use and operations using inputs from utility meters and computer modeling. Virtual energy audit software uses databases compiling information on local weather conditions, energy performance of similar buildings, statistics and 15-minute interval utility

data to provide data visualizations of building energy use, benchmark building performance and provide both operational and equipment-related recommendations.

A Better City (ABC), a Boston-based, non-profit organization that represents the interests of the business and institutional community on issues of transportation, land development, and the environment, was interested in learning more about virtual energy audits/assessments and conducted a pilot program with nine properties in Boston. These properties included Class A and B office buildings of various sizes and ages. ABC wanted to investigate the usefulness of virtual audits/assessments for building operations and management staff; if actionable improvements and opportunities were identified; the limitations of the technology; and if the technology was a viable alternative to more expensive walk-through audits. With funding from the Barr Foundation, ABC partnered with Retroficiency, a Boston-based remote energy auditing company for the pilot.

During the pilot project, building managers provided Retroficiency with interval utility data. Retroficiency analyzed the results using their basic virtual assessment method, which were accessible via a password-protected online interface. Retroficiency walked through the results with building owners via webinar. The results from the pilot were analyzed by a third-party consulting group, which also conducted follow-up interviews with participants.

Nine properties, totaling over 5.1 million square feet were audited as part of the pilot. This included six office properties covering more than 2.8 million square feet and three hotels totaling more than 2.3 million square feet. The virtual energy assessment provided a breakdown of energy use for each property. The breakdown included kWh, kBtu, and steam data.



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The virtual energy assessment results for participating buildings identified the potential for \$1,431,487 in annual savings from energy efficiency interventions. Several buildings in the pilot had invested heavily in energy efficiency prior to the virtual assessment; savings identified for these buildings were quite small, with the best performing property having no identified savings opportunities. The pilot identified a total of 7,211 tons of CO₂e reduction potential (This unit represents equivalent carbon dioxide, a common measure of global warming potential. It represents the quantity of a mixture of greenhouse gases in terms of the warming potential of CO₂ over time. For instance, methane, a more potent greenhouse gas, has a ratio with CO₂ of approximately 1:25.) This resulted in an average reduction of 901.4 tons of CO₂e per property. This was equivalent to identifying an average greenhouse gas reduction of 9.9 percent per building.

"The virtual assessments also found a total of 3,326 tons of potential greenhouse gas savings through HVAC improvements.

The virtual assessments also found a total of 3,326 tons of potential greenhouse gas savings through HVAC improvements, 2,510 tons through plug load energy reductions and 1,261 tons of emissions saving potential through lighting retrofits. The virtual energy assessment did not identify potential savings for all participating buildings as some properties were deemed to be highly efficient and were outperforming buildings with average operations and equipment.

In many buildings, walkthrough audits were conducted infrequently; the virtual assessment provided a quick way to gain intelligence on building operations. The need for interval utility data excluded some interested parties of the pilot. The virtual audit software also had findings inconsistent with the experience of building managers in steam heated and/or cooled buildings. These obstacles would need to be addressed in future virtual audit applications or pilots.

The pilot experience indicates that virtual energy audits/assessments may be a cost-effective way for building owners to enhance existing knowledge of their building's energy use profile and provide insight on how to move forward with efficiency projects in their spaces. They may also be a potential cost-effective compliance route for energy audit requirements that disclosure ordinances such as Boston's require. They also provide guidance for building owners to meet commercial sector emission reduction targets, which could lead to greater energy efficiency improvements.

Don't Let Magnitude of Data Cause You to Miss energy Saving Opportunities

As a global provider of SaaS, cloud-based solutions that help retailers manage their facilities, energy, and sustainability programs, 2013 was a year of growth and maturity for Verisae. With the WorkOasis



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and Hara acquisitions, Verisae now delivers a broad range of solutions to over 200 clients, including a number of the world's leading retailers.

Our new phased approach is an Energy Management system that is used to control energy costs and achieve success at each step. Verisae's solution sets are based on automating energy data collection and using that data to control energy costs. We create visibility and points of comparison where they don't exist today with concise reports and automated energy event management.

Often, because of the magnitude of the data, limited resources, or the need for complex correlation, large and protracted energy saving opportunities are missed. Simply having visibility, finding unrealized cost savings, and the ability to report effectively to Energy Star has been a major win for our customers.

Our users have been able to utilize data from our system to show an extremely high rate of correlation between issues raised through our predictive analytics and avoided equipment failures, saving time, money, and product loss. In one example, projected ROI has been achieved in half the time expected, and with only half of the implementation completed.

Specifically, our Energy Management solution, vx Conserve, gives retailers the ability to measure, manage, and monitor energy on one integrated platform. It provides a deep understanding of both supply and demand side energy as well as energy related projects.

We use remote alarm monitoring and a single mobile dashboard to help companies save on energy consumption, maintenance, and environmental management. The Verisae Platform acts as a data warehouse, correlating real-time energy data (from EMS, meters, and sub-meters) with utility bill data and site data as well as equipment maintenance events and energy anomalies. Organizations can track energy usage at category or asset levels, set benchmarks, reveal anomalies in real-time, and audit processes to reveal savings.

Verisae's Energy Analytics leverage the data warehouse to provide centralized analysis of energy consumption, usage patterns, impact of maintenance activity, equipment telemetry, weather, energy efficiency projects, and other site events. Verisae integrates this data with its workflow engine to help retailers move from cost containment to cost reduction, allowing them to use less energy every day and save millions.



Workflow on the go.

Enviance Apps enable you to create solutions that support your business specific workflow processes with ability to access your data and reports from the field, the plant, or your desktop.

Contact us to learn more about our library of solutions such as the AuditApp and the InspectionApp Series. You'll be more productive with workflow on the go.

Verisae supports a comprehensive Energy Management program designed to meet the needs of our customers at all levels of managing energy. Our customers can reduce energy consumption, improve employee utilization, negotiate better supply contracts, avoid unnecessary costs, and maximize capital project dollars. The power of Verisae's software platform comes from correlating business information, people, processes, and analytics across traditionally disconnected systems and operations.

Verisae's 'Connected Facility' is unique in that it integrates these various data inputs (that are otherwise desperate) using a rules engine to find anomalies and suggest actions so that you don't have to. We make use of data you already have.

The growing Verisae system creates one of the largest global networks of its kind. Unlike many other service providers and manufacturers that provide narrowly focused applications, we allow for a completely integrated maintenance, energy, and sustainability management platform.

P&G Achieves 10% Energy Cost Savings with JLL's IntelliCommand

Procter & Gamble (P&G) is no stranger to setting aggressive, data-driven efficiency, sustainability and profitability goals, but it is the company's unique participation in a new smart building technology program that is driving proven performance gains with first-year average energy cost savings of 10 percent. After deploying JLL's IntelliCommand smart building management technology in a test group of laboratories, offices and R&D facilities, P&G's initial investment in the technology was returned within the first three months of energy cost savings.



Dan Probst

Chairman,
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"By converting to a smart building system that uses predictive analytics to detect building performance abnormalities before they occur, we not only achieved energy savings in our corporate real estate portfolio, but we also improved building equipment reliability and the physical comfort of our employees," said Larry Bridge, Global Facilities and Real Estate Governance Manager at P&G. "This pilot program confirmed that by using IntelliCommand, we can significantly improve the productivity of our buildings and employees."

IntelliCommand is a smart building management platform that offers 24-hour, seven days per week real-time remote facility monitoring and control across multiple locations, combined with the JLL integrated facilities management operations. Powered by Pacific Controls technology, the system includes continuous building commissioning, automatic work order generation, seamless smart grid integration and compatibility with all major brands of automated building system sensors.

Smart Buildings, Smart People

In 2011, JLL proposed that P&G become the first company to test IntelliCommand, in support of the two companies' mutual goal of identifying innovative new approaches to achieving energy efficiency, cost-savings and building performance management goals. P&G's immediate goal was to apply IntelliCommand's proprietary data analytics capabilities to inform its real estate decisions and produce significant energy cost savings within one year. The premise was that IntelliCommand's combination of cloud-based smart-building management technology with JLL's team of facilities management professionals would provide P&G with 24/7, real-time facilities management.

With these goals in mind, P&G deployed IntelliCommand across 12 buildings totaling 3.2 million square feet of real estate. The pilot sites included P&G's global headquarters campus in Cincinnati; its global healthcare headquarters facilities, including numerous laboratories; a key technical center; and a major mixed-used complex.

Return on Investment

Where buildings may be "commissioned," or tested for maximum energy efficiency, every few years, IntelliCommand enables continuous commissioning and performance adjustments that would dramatically reduce energy consumption and costs.

In fact, within 11 months, P&G had achieved overall pilot portfolio savings of 10 percent, or 4,400,000 kilowatt hours—with the demonstrated potential to achieve additional savings. Results were particularly strong at P&G's technical center pilot site, where energy costs were reduced by 16 percent. P&G's initial investment in the IntelliCommand deployment was returned in the first three months.

P&G was able to achieve energy savings and performance improvements, even though some of the pilot facilities were older and did not feature fully-automated systems. Smart buildings do not need to be new buildings.

"IntelliCommand is helping us achieve our departmental goal of reducing our energy usage by 20 percent by 2020," said Bridge.

Smart Buildings Are Getting Smarter, More User-Friendly

New smart building technologies are making the systems that



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run buildings more responsive and reliable for the people and businesses within their walls. Advances in building and information technologies have brought a new Big Data analytics-based approach to facilities management—one that ushers in a new era of operational control, reliability and productivity for businesses and workers.

Technological advances have finally converged with long-existing and significant opportunities for improving energy efficiency and the user experience within buildings. Tenant satisfaction is improving, while building operating costs are reduced, especially when tenants are actively engaged with controlling energy usage.

"Smart building technologies can be used to provide a more customized and energy-efficient experience for building users.

Today's computer-controlled "smart" building systems can be programmed to accommodate the needs of building occupants. Lighting and temperature, for instance, can automatically adjust during peak and off-peak occupancy periods. In addition, these automated systems generate reams of data that a smart building management service can transmit to a remote data center for analysis by facilities professionals.

The Big Data generated by smart building systems is a major force shaping the human experience within buildings. Building data analytics provides unprecedented insight into energy use and facilities operations. Using predictive analytics, facilities managers can anticipate and address user needs and requests related to heating, ventilation, lighting, way-finding, security and more. Smart building technologies

can be used to provide a more customized and energy-efficient experience for building users—think, better temperature, lighting or security control for offices, and more reliable power for manufacturing facilities. Affordable new technologies driving smart building progress

Recent significant price reductions in cloud computing-based building management technologies have made these systems affordable. Wireless sensors, used in smart building managed services such as JLL's IntelliCommand, for example, are now available for less than \$10 per unit. These wireless sensors can transmit data from smart systems in hundreds of buildings to far-flung remote cloud-computing platforms where advanced analytics can turn data into actionable intelligence to improve building performance. This highly automated platform is further supplemented by "command centers" staffed around the clock by facilities data analysts who can support the on-site property team.

Building occupants' growing expectations

Smart buildings can boost tenant satisfaction and productivity. Along with next-generation buildings comes a new generation of building occupants, with new workplace preferences and expectations for their work facilities. Companies increasingly rely on mobile workers, and smart buildings are able to adapt more readily to new flexible workplace models. Clean, green, efficient buildings are gaining a marketing advantage for landlords.

The trend for employees to connect from anywhere, or to bring their own devices to custom-fitted work settings, will profoundly change the way building owners lease space. Demand for more network sophistication that can adapt to changing work patterns will play to the advantage of smart building owners.

Smart buildings can also help companies use sustainability as a hook for engaging employees. In a major Empire State Building energy retrofit, JLL added smart building components to the landmark office property. Real-time energy displays enable Empire State Building tenants to better monitor and control their energy consumption, and even compete with other tenants in the building to achieve energy savings.

Looking ahead is Fraunhofer CSE's Building Technology Showcase in Boston that houses Fraunhofer's building science research facilities, designed to consume half the energy of a comparable structure. In the lobby, an iPad-driven display shows the building's internal smart building technology at work, with digital read-outs showing real-time energy gains in lighting, cooling and heating, water use and energy generation. It's a simple but powerful idea that potentially could be applied in every smart building lobby.

Smart buildings can increase employee comfort, engagement and productivity, according to JLL's latest report, *The Changing Face of Smart Buildings: The Op-Ex Advantage*.

Intelligent Live Recommissioning

When we launched EnergyMentor, our energy management system (EMS), in 2009, the idea behind it was simple: you can only manage your energy if you understand how

you are consuming it. This concept still holds true, and we still have an effective EMS dashboard, but we've learned this approach is effective only with customers who are well equipped to understand the tools and actualize the benefits.



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In terms of energy efficiency, “actualize” is really the key word. Real-time analytics can identify waste, highlight savings opportunities, and even provide recommendations on efficiency measures; however, to actualize the opportunities, operators must act on what the dashboard is showing them.

The truth is that many companies simply aren't prepared to implement the continuous improvement activities required to get real benefits out of an EMS due mostly to resource bandwidth constraints. Vendors, SHIFT included, have repeatedly tried to solve this problem by offering consulting and program support. We offered a tiered Virtual Energy Manager (VEM) service to help turn our insight into action for customers. This was sometimes very effective, although expensive. Regardless, we still had a number of customers who could not get the focus and support to turn insight into dollars, even with help.

"A typical facility generates more than 5,000 unique variables each minute that can impact energy.

This got us thinking – how can we drive energy savings in buildings without drastically changing the lives of the building operators? With the recent advancements in cloud computing, big data analytics and real-time machine to machine communication, perhaps there was a way

to automate savings using the tools already available to operators? To emulate what a well-equipped operator was doing to capitalize on energy opportunities, but in an automated fashion? When we set out to automate these activities (often referred to as continuous recommissioning), we discovered that through the application of software-based technology, our target savings potential could not only be realized, but greatly expanded by applying a concept called Intelligent Live Recommissioning (ILR).

ILR involves constant adjustment to existing building automation. A typical facility generates more than 5,000 unique variables each minute that can impact energy. Proactively processing, correlating and making sense of this volume of data is not manually possible. By leveraging the virtually unlimited processing power of our cloud based data center and utilizing smart algorithms, a building or portfolio of buildings can now be optimized as a complex energy eco-system. Based on these concepts, the idea of an Energy Optimization System was born.

Armed with our ideas, we set off to find co-development partners who would allow us to use our Energy Optimization System (EOS) to manage their building with the goal of advancing technology and saving upwards of 15 percent annually on energy. We selected the Vancouver Canucks as our first early adopter and are now approaching the completion of our EOS at Rogers Arena in Vancouver. With the first successful building deployment underway, serious interest

from early adopters in other industries started to arise. We're now working with EllisDon and University Health Network (UHN) on our next wave of pilots.

Energy and its environmental impact is a top concern worldwide. By eliminating energy waste in buildings, companies not only reduce costs, but also lower environmental footprints.

Top 10 Smart Building Myths—Busted

Smart buildings are a no-brainer and more affordable than most building owners and investors realize.

Smart buildings have been proven to save energy, streamline facilities management and prevent expensive equipment failures. Yet, to many property owners and investors, the value of smart buildings remains a mystery. The fact is, in most buildings, we can demonstrate a strong business case for strategic investments in smart building systems and management technologies.

Not everyone is aware that the tremendous advantages of today's affordable smart building management technologies easily justify the cost. The following are 10 myths about smart buildings, along with the facts:



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Myth #10: Smart Building Technologies Are Expensive

Myth Debunked: Smart building technology investments typically pay for themselves within one or two years by delivering energy savings and other operational efficiencies. One smart building management pilot program we worked on, for example, generated a positive return on investment within several months.

Myth #9: Smart Buildings are Only About Energy

Myth Debunked: A smart building management system often can detect when a piece of equipment is close to failure and alert facilities personnel to fix the problem. Knowing the right time to repair or replace equipment extends machinery life, and reduces facility staff, operations and replacement costs. More dramatically, smart building management systems can prevent full-scale building system failures—potentially embarrassing to a Superbowl stadium host, but life-threatening in a hospital or laboratory.

Myth #8: Smart Buildings and Green Buildings are the Same Thing

Myth Debunked: Smart buildings maximize energy efficiency from building systems and ensure air quality, while a complete “green” sustainability program includes strategies beyond building automation systems. So, while “smart” and “green” features may overlap, they are not identical concepts. The Continental Automated Buildings Association (CABA) explains the difference in Bright Green Buildings: Convergence of Green and Intelligent Buildings, a comprehensive report authored with Frost and Sullivan.

Myth #7: Industrial Facilities or Laboratories Can't Become Smart Buildings

Myth Debunked: All types of buildings—whether residential or commercial—can be built or retrofitted to become highly automated and smart. Even highly specialized facilities such as laboratories can be outfitted with smart building technologies.

Myth #6: Smart Buildings Can Only Be New Buildings

Myth Debunked: Some of the smartest buildings in the world are not new at all, but have demonstrated the return on investment in smart technologies. The Empire State Building, for example, has exceeded projected energy savings for the second consecutive year following an extensive phased retrofit begun in 2009.

Myth #5: Smart Building Technologies are Not Interoperable

Myth Debunked: In the past, building automation equipment and controls were designed as proprietary systems. However, affordable new technologies, such as wireless sensors, now make it possible to gather data from disparate systems produced by any manufacturer.

Myth #4: Smart Systems Don't Make a Building More Attractive to Tenants

Myth Debunked: Anything that improves energy efficiency, reduces occupancy cost and improves productivity is valuable to tenants, as numerous studies and surveys attest. Tenants and their advisors increasingly expect smart building features such as zoned HVAC, sophisticated equipment maintenance alert systems, and advanced security systems. As reported in JLL's October 2012 Global Sustainability Perspective, smart systems provide benefits for tenants—and tenants recognize the benefits.

Myth #3: Without a Municipal Smart Grid, a Building Can't Really Be Smart

Myth Debunked: It's true that smart buildings gain functionality when supported by advanced electrical grids installed by municipalities and their utility company partners. But even without a smart grid, owners and investors can draw a wide range of benefits from smart buildings and a smart building management system that can monitor entire property portfolios.

Myth #2: Smart Buildings Are Complicated to Operate

Myth Debunked: Combined with a smart building management system, a smart building is often easier to operate and maintain than a building that lacks automated systems. A smart building management system can integrate work-order management applications; pull equipment repair and maintenance data into performance analytics; and pinpoint equipment issues to a degree not humanly possible. For example, a smart building management system can diagnose a programming problem that has been undetected for 15 years, enabling facility managers to resolve a recurring equipment malfunction.

Myth #1: Smart Buildings Are a No-Brainer

Myth NOT Debunked: This myth isn't a myth at all — it's actually true. As affordable new technologies are adopted, tenants are beginning to expect smart building features—and owners and investors are beginning to realize the return on investment in smart systems.

Monitoring & Controlling HVAC, Refrigeration & Lighting Systems Results in 12.3% Energy Reductions

EH Controls is a provider of Energy Management Solutions, and as such we have installed the Siemens EcoView Energy Management System into many facilities in the London, Ontario, area. My favorite installation was done as a donation to the London

Food Bank. The basis for the installation was to monitor and control the HVAC, refrigeration and lighting systems in the overall building which includes offices, warehouse and walk-in coolers and freezers.



Peter Croppo

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Our initial M&V for the first 6 months of site control was 12.3% energy reductions (mid April - mid October 2013). We anxiously await the next edition of M&V data for the heating season, but overall we estimate saving several thousand dollars annually in energy costs, which will help the Food Bank direct those funds toward supporting needy families in the community.

A Surprise Finding and Lessons Learned

Our company was wrapping up a small mechanical retrofit project for a non-profit organization and filling out the utility energy efficiency rebate application. I asked their office manager for a recent gas bill, and she said, "We get three gas bills every month. Is that normal?"



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No, it wasn't normal. After some digging, I found that they were being grossly overcharged by a third-party supplier. After more digging, I found that this scenario had been going on for several years. I calculated almost \$60,000 in overcharges, and brought it to their attention for corrective action.

This has taught me two important lessons. First, even if you're not looking at a building-wide energy management program, you should always complete a utility bill audit and get the "big picture" view. How much energy per year, what is the net cost per unit, etc. You might find something surprising.

Second, even employees with the best intentions don't always have the right skill set. If the office manager is responsible for reviewing and paying utility bills, how will he or she know if they're correct? Education and expert guidance can help avoid problems.

10MW Connected Load Reduction Achieved via HVAC Retrofits

At Infosys, we have achieved 10MW connected load reduction through major HVAC retrofits done in all our India campuses, in the last three years.



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In October 2010, we started our deep retrofit projects and we had set the goal of 5MW connected load reduction to be achieved in 3 years. But, as a result of our major HVAC retrofits we were able to achieve 10MW reductions by February 2014.

Some of the Major HVAC Retrofits

Variable Primary Flow (VPF) system conversion: The approach to HVAC re-engineering is to retrofit existing chiller plants to upgrade them to the highest efficiency standards. This includes redesigning of pumps to match the actual operating head, changing the pumping system from constant speed or primary-secondary system to variable primary flow system, and integrating variable speed drives and smart controls to the plant room for accurate demand based operation. This will reduce the number of pumps in the plant room, reduce capacities of pumps thereby reducing connected load and operating load leading to energy savings.

Chiller replacement: Chillers are the highest energy consuming equipment in air conditioning systems. Old and inefficient chillers will be replaced with new chillers with an efficiency improvement of 20% to 50%. For example, replacing air cooled chillers with water cooled chillers improves the efficiency by nearly 2 times. Series counter flow arrangement will save 6-8% over and above the new chiller efficiency.

HVAC low side retrofits: New approach to HVAC Low side system with 2 different chilled water loops to separate the sensible and latent heat. Currently low temperature chilled water is being used for both the loads. If the loads are separated, the temperature of chilled water required will be higher for removing sensible heat and therefore improves chiller efficiencies. The existing Air Handling units will be retrofitted with additional coils that would carry high temperature chilled water.

Results of Energy Management Initiative Undertaken by Harbec Plastic

Background: Harbec Plastics is a progressive injection moulding company in upstate New York which provides model making, precision mould making, and precision plastic injection moulding.



In November 2012, using Enerit ISO 50001 Manager Pro software, Harbec began implementing an Energy Management System (EnMS) in accordance with ISO 50001 and the Superior Energy Performance (SEP) program with the overall aim of achieving carbon neutrality.

Twelve months later, in December, 2013, Harbec achieved carbon neutrality, SEP certification and the independent verification of a 16.5% improvement in energy performance. These results currently place Harbec in the top 5 of the US Department of Energy SEP performers.

Why Harbec Embarked on SEP Certification

Harbec's aim of becoming carbon neutral started as a customer challenge. Customers assured Harbec's management of the volume of potential sales that existed for carbon neutral suppliers. Eager to market carbon neutral products to companies who themselves were concerned about the carbon content of their products, Harbec set a goal to become carbon neutral by the end of 2013.

Aware of the requirement to be able to clearly quantify and verify reductions in carbon footprint, Harbec identified the Superior Energy Performance program as a clear framework for validating carbon reduction and energy performance results.

How Harbec Achieved 16.5% Improvement in Energy Performance

SEP had a significant, systematic impact on how Harbec identified energy saving opportunities, resulting in many new savings opportunities being identified.

Using the Enerit ISO 50001 Manager Pro software, Harbec managed the process of prioritizing and implementing these energy saving opportunities in a systematic and consistent manner involving all stakeholders within the company.

Automating this process using software expedited certification through giving Harbec the ability to quantify the savings associated with each energy saving opportunity.

The Enerit software also featured as a database for all ISO/SEP related documentation ensuring the latest version is available.

Prior to achieving SEP certification, the typical split of energy savings between operational (i.e., low cost or no cost) and capital improvement projects was 70% capital 30% operational. Following SEP implementation these figures were reversed i.e. 30% capital 70% operational. Energy savings came primarily through better management of Harbec's Co-Gen plant with the most significant energy saving opportunities involving the compressed air and chilled water systems.

The reductions achieved did not require costly new equipment or major changes. Harbec was able to optimize existing equipment and used the SEP framework to provide the system of measurement and understanding.

Harbec has had a long-standing commitment to energy efficiency. As a result minimal employee training was required as all employees had an awareness of energy consumption and ways to decrease usage.

The results achieved by Harbec involved almost no capital investment and were obtained by verifying existing operational controls related to both energy use and production and financial efficiencies

An Important Year for Green Building

The last year was an important year for green building at Symantec as we continued to move closer to our goal of obtaining LEED and Energy Star certifications for 100 percent of our owned or long-leased facilities. We've reached 22 LEED certified buildings, an accomplishment which has brought our certified facilities to 82% of our eligible real estate square footage. We are also leveraging our current efforts to take green building at Symantec to the next level through focused campaigns on energy efficiency, waste reduction, and increasing our use of materials with recycled content. Focusing on these three key components of LEED certification allows us to create high efficiencies, results in cost savings, and impacts Symantec positively in terms of our environmental footprint and brand reputation.

A highlight this year was the development of two LEED Platinum certified facilities in Pune, India, bringing the number of our LEED Platinum facilities to a total of three. The Platinum certification, which recognizes the highest level of performance, is not easy to come by, however, our two offices performed strong across the board.

Due to the hard work and expertise of the project development team, the offices scored 88 and 89 out of 100 and received "notable achievements" in key areas such as alternative transportation, water efficiency, aligning with regional green building priorities and reducing building energy consumption. To achieve this level of performance and optimize our efficiencies, we leveraged subject matter experts and best practices in green building throughout the design and building process. For example, at one site we reduced potable water usage by 53.74% from the calculated baseline design, and 95.81% of construction waste was diverted from landfill.



Cecily Joseph

Vice President,
Corporate Responsibility,
Symantec

www.symantec.com/corporate_responsibility/

Identifying Upgrades & Retrofits that Increase Energy Efficiency

At U-Haul, we are committed to sustainability, and the U-Haul business model endorses sustainable practices by providing equipment and services geared toward division of use and

specialization of ownership. Although our core business practice of truck sharing directly reduces carbon emissions and consumption of fuel, we understand that energy efficiency is a critical



Allan Yang, Ph.D.

Director of Corporate Sustainability,
U-haul International

www.uhaul.com/sustainability

part of operating sustainably. Consequently, we established a Corporate Energy Management (CEM) Program to implement energy-efficiency initiatives. One of the goals of our CEM Program is to ensure that U-Haul remains an industry leader through excellent corporate citizenship and energy-conservation practices. As result of these efforts, in 2010, U-Haul was recognized by The Alliance to Save Energy for the Company's achievements in energy reduction, and received the "Galaxy Star of Energy Efficiency Award."

"In 2013, U-Haul initiated more than 370 energy-efficiency projects at our centers, which collectively achieved an estimated annual savings of \$1.5 million in energy costs.

For the past six years, U-Haul has invested a great deal of capital to increase energy efficiency in our centers. In 2013, U-Haul initiated more than 370 energy-efficiency projects at our centers, which collectively achieved an estimated annual savings of \$1.5 million in energy costs. Since the program's inception in 2008, the approach of the U-Haul CEM Program and its energy- efficiency projects have produced an annual reduction of \$6 million in energy costs. Each U-Haul center that has completed an energy-efficiency project realizes an average 45 percent kWh reduction, and has the potential to reach a total return on investment in three years.

When executing strategies to increase energy efficiency, our objective is to identify upgrades and retrofits that will reach a quick payback by reducing energy costs, utilizing utility programs and be eligible for rebates. Retrofitting existing lighting applications at U-Haul centers with improved

energy-efficient technology has shown itself to be one of the most beneficial investments. Other worthwhile energy-efficient investments include state-of-the-art thermostats, occupancy sensors, photocell sensors, upgrades to heating and cooling (HVAC) technologies, weatherization, improvements to propane dispensers and installation of energy-efficient windows and doors.

Advancing our energy portfolio has proven to be exceedingly fiscally responsible. It has produced immediate up-front financial returns while adding savings not only in the area of utilities but also building maintenance and repair. Aside from the reduction of energy use, U-Haul has received positive feedback from its team members regarding more comfortable work areas and increased visibility, which in turn lead to improved safety and satisfaction for our customers. Cities and

municipalities that harbor U-Haul centers also stand to benefit, as our company's energy-efficiency practices facilitate their goals in achieving carbon neutrality and improving the quality of the environment. Within the next year, U-Haul will soon have retrofitted the lighting inside of 95 percent of its 1,600 centers. As we move forward, the company plans to achieve prolonged success in reducing energy consumption by exploring other areas such as the potential energy savings of exterior LED lighting. Ultimately, being committed to sustainability, U-Haul will also expand its energy portfolio towards additional energy-efficient technologies.

The Internet of Lights & Energy Management

The term Internet of Things has become the latest buzz phrase – referring to a highly interconnected world where objects or "things" can sense and interact with other objects in their environment to support various goals. Despite the

potential overuse of the term, the excitement comes from the fact that it refers to a pivotal set of technologies at the intersection of physical devices and software that will transform energy management and operational optimization.

While the notion of the Internet of Things is not new, there have been several technology advances that make the Internet of Things more likely now than it was two decades ago. Cheaper and faster processing, ubiquitous networking and open development stacks are helping to pave the way. However, much is left to do before the Internet of Things is more than a collection of siloed, IP-addressed objects.

As ubiquitous devices in any environment, lights are the most practical and cost-effective vehicle to introduce the Internet of Things. Why lights? If you estimate a 4:1 ratio of lights to people in most environments, lighting is one of the most logical access points for the Internet of Things, and we call this the Internet of Lights. By building a backbone with an Intelligent Lighting System, organizations can generate actionable data to optimize everything from staffing and equipment utilization to inventory and energy management.

As more and more devices become wirelessly networked, intelligent lighting is the fastest and most efficient gateway to the industrial Internet of Things, which will have a huge impact on innovation in 2014 and beyond. Intelligent lights deliver massive energy savings, while delivering a broad range of other building management capabilities. This means that intelligent lights – or the Internet of Lights — are a force to be reckoned with in the Internet of Things. And best of all, the Internet of Lights will pay for itself on energy and maintenance savings alone.



Tom Pincince

President & Chief Executive Officer,
Digital Lumens
www.digitallumens.com

Intelligent Live Recommissioning

When SHIFT Energy launched EnergyMentor, our energy management system (EMS) software back in 2009, the idea behind it was simple: you can manage your energy if you knew where and how you are spending it. The

concept still holds true, and we are still serving EMS dashboard, analytics and reporting tools to customers who are equipped to utilize them and get the benefits.



Arick Disilva

Director of Marketing & Communications

SHIFT Energy

www.shiftenergy.com

Here, “equipped” is the qualifying word. Information and insight is as good as what you are doing with it. Real-time dashboard and analytics can identify waste, highlight saving opportunities and even provide recommendations on efficiency measure. But to realize the opportunities, you have to act on what the dashboard is showing. The truth is, many companies simply aren't prepared to implement the continuous activities required to get the most benefit out of an EMS due to resource shortage and bandwidth constraints. Vendors try to solve this problem by offering consulting, program support etc. SHIFT had been doing that too. By offering a tiered Virtual Energy Manager (VEM) service we were assisting customers who needed help. But this adds to the cost of EMS implementation and churns at the ROI case.

That got us thinking. With all the advancement in building automation technologies and software intelligence there should be a better way for our customer to manage their energy – or better yet, not have to manage it at all! What if we could create a solution that would automate the continuous optimization process a successful EMS program would require? Utilizing machine-to-machine learning, cloud computing and software intelligence, the target savings potential could not only be realized, but greatly expanded. This is how EOS (energy optimization system) was born. EOS uses Intelligent Live Recommissioning (ILR) to constantly adjust the Building Automation System (BAS) of a building and tunes it every minute for optimized energy usage. A typical facility generates more than 5,000 unique variables each minute that can impact energy. Proactively processing, correlating and making sense of this volume of data is not manually possible. By leveraging the virtually unlimited processing power of our cloud based data center and utilizing smart algorithms, a building or portfolio of buildings can now be optimized as a complex energy eco-system.

Armed with our ideas, we set off to find co-development partners who would allow us to use EOS to optimize their building with the goal of advancing technology and saving upwards of 15 percent annually on energy. We selected the Vancouver Canucks as our first early adopters and are approaching the completion of our first early adopter EOSTM implementation at Rogers Arena in Vancouver. With the first successful alpha release of EOSTM in 2013, we started to generate

serious interest from other early adopters in the energy management space. We're now working with companies like EllisDon, UHN and Cadillac Fairview on our next wave of pilots.

Energy and its environmental impact is a big issue worldwide. By solving the problem of inefficiency and waste, we hope we can help companies become more efficient and sustainable by reducing their energy consumption - resulting in a lower environmental footprint and a substantial energy cost savings.

Lessons Learned from Submetering Research

Legrand has implemented a submetering initiative to uncover energy saving opportunities beyond the straightforward retrofit opportunities and process changes that we have already identified and employed. In 2011, we began the process

of installing electrical submeters in 14 of our US facilities, with the last installation being completed in 2013. This process was part of our commitment to the DOE's Better Buildings, Better Plants Challenge to implement energy management and savings strategies and achieve an energy intensity reduction of 25% in 10 years. This submetering initiative has already uncovered energy savings opportunities.

One example of these energy savings opportunities occurred in one of our California facilities where we were able to lower peak demand by redistributing hourly energy demand. In this Legrand distribution warehouse, the major electrical loads were attributed to lighting and charging the forklift batteries at the end of the day. Lighting in the facility runs from 9:15 AM to 6:30 PM while the energy consumed by charging the forklift batteries occurs from 6:15 AM to approximately 1:00 AM. A peak in kW demand was detected by one of our submeters from 6:15 PM to 7:15 PM, coinciding with the time when forklift batteries are plugged in to begin recharging. To eliminate this peak, the forklift battery chargers were placed on a timer so that charging begins after the lights have been shut off in the facility. Without submeters, this level of transparency into the cause behind the demand peak would have been impossible. When it comes time to restructure our electricity rate, our lower peak demand will result in even further energy cost savings.



Susan Rochford

Vice President of Energy Efficiency,
Sustainability & Public Policy,
Legrand North America
www.legrand.us

The Lessons

In order to share our experiences with others looking to pursue energy efficiency projects, we've released a white paper detailing the lessons learned from submetering research, to project approval, to installation and data mining to making actual changes in our operations.

These lessons include:

- » **The case for submetering**
- » **Technical knowledge wanted: electrical engineering & IT**
- » **Dashboard the data**
- » **Assemble the right team**
- » **Peak demand drives up costs**
- » **Operate at optimum ratios**
- » **Break down the complex facility**
- » **Detect the basic anomalies**
- » **Employee engagement is key**
- » **Communicate results**

These lessons can be applied directly to other manufacturing, distribution, and office facilities that already have submeters in place or are contemplating submeters as a means for energy management.

The Bedford-Stuyvesant YMCA of Greater New York Energy Savings via LED Lighting, July 2013

Challenge

The Bedford-Stuyvesant YMCA was founded in 1888 and has since steadily expanded into today's 65,000 square-foot facility. Determined to maintain operational sustainability, the Bedford-Stuyvesant YMCA recognized the

need to upgrade its lighting in the pool and surrounding areas. Situated in the lower level, the space receives minimal natural daylight and thus requires a significant amount of artificial lighting power. Upgrading to more energy efficient equipment was the logical step to take.

The property manager, Felix Gonzalez, contacted us to help him meet the challenge. Bright Energy Services (BES) successfully upgraded the lighting in two major sections of the McBurney YMCA facility last year, and is currently in the process of retrofitting six more branches around the city.



Bonnie Hagen

Chief Operating Officer,
Bright Energy Services
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Solution

we performed a lighting audit and presented an energy analysis and a financial analysis to Gonzalez. I recommended replacing the existing fluorescent, high-pressure sodium, and incandescent lamps with LED (light emitting diodes) lamps. LED lighting has come a long way technologically and significantly reduces energy load, and therefore, energy expenses. Gonzalez reviewed the analysis and determined that, with better light quality and a longer life cycle than traditional fluorescents, it made good financial sense to upgrade to LEDs.

BES selected the best LED products to use for the facility as well as the installation team. R.B. Evans of Lightel Technologies supplied Aledra LED lamps for the project. Evans explained, "This innovative LED linear light tube only uses 50% of the energy of the existing lamps while meeting the most current UL standards, putting the Aledra LED T8 in a class of its own."

We managed the project from start to finish, coming in on time and on budget.

Benefits/Savings

In the pool area, 14 high-pressure sodium lamp fixtures which were 480 watts each were changed to 1X8 LED lamp fixtures which are 102 watts each. Three wall mounted 180 watt wall pack fixtures were changed to 50 watt LED wall pack fixtures. The fluorescent T8 77 watt fixtures and the fluorescent T12 96 watt fixtures were changed to LED 68 watt LED fixtures. The yearly savings is approximately 50,000 kWh and \$10,100, or 78%.

Reduced Operational Expenses

There are many benefits to moving to LEDs that are hard to quantify. LEDs burn cooler, so the heat load is reduced, also reducing cooling costs. LEDs do not use ballasts, so ballast replacement costs (ballast and labor) now become zero. Life expectancy of LEDs are 5-10 years, so replacement product and labor costs are also reduced.

Financial Rebate

Because of the significant kWh savings, BES applied to Con Edison and NYSERDA for an energy efficiency financial rebate which is expected to come in at approximately \$6,000. With the rebate and energy savings (not to mention the reduced operational expenses), the payback period is just over one year.

Creating a Physical Manifestation of Sustainable Strategies

The charge to Shepley Bulfinch was to create a physical manifestation of Philadelphia University's institutional commitment to sustainable strategies, which is evident through both their approach to campus environment, and their nationally recognized sustainable design degree programs.



DEC Center Project Team
Shepley Bulfinch
www.shepleybulfinch.com

The aluminum veil that wraps around Philadelphia University's Center for Design, Engineering and Commerce (DEC) is an iconic form that contributes significantly to a reduction in solar heat gain, while maximizing views for occupants. Design and construction of this solar screen "floating" around the building with air circulating beneath it called for an innovative design and engineering approach. Close integration of thermal, structural and aesthetic performance criteria was required.

To provide maximum visual and performance impact, the building is oriented so that the solar screen provides protection along both sides of the longest exposure. Set off from the building by prominent metal bracing, the 50% perforated metal screen shields the structure from the glare and heat gain of direct sunlight on the façade, and allows air movement between the building mass and the veil to cool the building further. The screen geometry is calibrated to coordinate its shading capabilities with access to daylighting and views.

The behavior of the screen is complex relative to racking, wind force and shear. To minimize connections to the building that would compromise thermal integrity of the enclosure, an innovative structural support system consisting of outrigger "spider" bracing was designed. The bracing anchors to the building's precast secondary structure and does not have to penetrate the skin. Anodized aluminum was chosen for the screen based on its light weight, modest cost, durability and resistance to corrosion. Perforated, profiled aluminum sheeting spans the ribs, which are 9' apart, without requiring sub-supports. Neoprene gaskets protect connections from galvanic action where steel meets aluminum.

The screen geometry is calibrated to coordinate its shading capabilities with access to daylighting and views, and the insulation and absorption provided by the green roof. The modular vegetated green roof system reduces heat island effect, lowering the amount of energy needed to condition the building by maintaining a constant, cooler temperature on the roof. The green roof helps reduce storm water run-off by approximately 50% annually by absorbing some rainfall and slowing the rate of run-off, decreasing stress on the sewer system.

Business & Local Government Join Forces to Advance Community Energy Projects

Local citizens in communities all across American have ideas about how to deploy novel new concepts in community energy, but often these ideas and proposals are beyond the scope of local officials to comprehend or they don't want to undertake an evaluation for reasons they are often unwilling to disclose.



Les Blevins

President & Chief Executive Officer,
Advanced Alternative Energy Corp.
www.aaecorp.com/ceo.html

Community energy projects can generally be defined as those between one and 20 megawatts. This is a sector that is often overlooked when smaller-scale renewables like solar photovoltaics, and larger-scale renewables such as commercial scale wind, receive more attention.

The advantage of community energy projects is communities can develop a biomass, waste-to-energy, solar or small wind project themselves, and with local funding, and add significant amounts of renewable energy to their local grid without waiting for outside developers.

There are many ways businesses and local governments can join forces to build community energy projects. Our product lines can be manufactured in the US and in most any locality for the local and regional market and exported. I believe this could create more jobs and help an alternative energy hungry world.

Cashing in on Energy Efficiency

In the United States, the average commercial building wastes approximately 30% of the energy that owners and tenants pay for. On an annual basis, energy waste costs owners and tenants more than \$60 billion, which is equivalent to:



Robert Roth, Ph.D.

Chief Executive Officer,
EnergyActio
www.energyactio.com

- » **\$60 billion in lost business profits**
- » **\$857 billion in lost capitalized asset value (at a 7.0% cap. rate)**
- » **Funding for 1.3 million jobs (at the 2013 average wage of \$45,790)**

The good news is that improving energy efficiency is an \$800 billion opportunity. The bad news is that very few owners or tenants are cashing in.

Our new e-book, *Cashing in on Energy Efficiency*, introduces a simple continuous improvement process for taking advantage of energy efficiency opportunities in repair and maintenance (R&M), tenant improvement (TI) and renovation projects.

Implementing energy efficiency continuous improvement results in:

- » **Owners cashing in on increased net operating income and capitalized asset value.**
- » **Property managers cashing in by making their services irreplaceable.**
- » **Tenants cashing in on smaller energy bills, and**
- » **Contractors cashing in to win more R&M, TI and renovation projects.**

By implementing energy efficiency through continuous improvement, owners, managers, tenants and contractors can cash in on the tremendous energy efficiency opportunity.

The Five Billion Euro Question

The five billion euro question should be: where's ROI? The European Court of Auditors was recently looking for return on investment for the five billion Euros (\$6.7 billion) spent through the European Union's Cohesion Policy Fund. The Cohesion is a European Union regional policy that provides a

framework for financing a range of projects intended to encourage economic growth in member states. Since 2000, the EU, through its Cohesion Policy funds, spent about €5 billion (\$6.7 billion) for co-financing energy efficiency measures in member states. After assessing whether the energy-efficiency investments were cost-effective, the European Court of Auditors determined that the funds were not well spent and that the planned payback period for the investments was 50 years on average — and up to 150 years in certain cases. This seemed to me to be the biggest story you never heard this year. The importance of this announcement is magnified by the need for the European Union to spend Euros wisely. The EU will not encourage economic growth with those returns. The Court of Auditors looked at twenty four energy efficiency projects for public buildings and they found that project managers did not have "rational objectives in terms of cost-effectiveness." The sad truth is that the European Union's Cohesion Policy Fund is certainly not alone. It seems that reality seldom reflect the many "up to 50% energy savings" and similar claims. But in these times of confusing claims, there are some very positive developments. A recent Time magazine article, "Smart Power: Why More Bytes Will Mean Fewer-and Cleaner-Electrons," states that "cutting energy waste is....first and foremost a data challenge." It adds that "thanks to the growth of smart sensors and the big data they produce—along with new companies that know how to crunch that information—energy users from huge factories down



Dennis Roberts

President,

Energy Efficiency Done Right

www.inflectorglobal.com

to individual households can track and reduce waste in a way that simply wasn't possible just a few years ago."

There is no reason for missing the efficiency goal in this environment. At Energy Efficiency Done Right, we are dedicated to provide justifiable energy consumption reduction estimations, then benchmarking the results. To create significant energy savings you need to know how most of the energy is being used and address it. We have created for our company and our customers an Energy Savings Calculations Task Force of energy professional to create spreadsheets using detailed building data to estimate energy consumption reductions. We then plan to benchmark window insulator installations to show that each installation met or exceeded the cost savings estimation. Our goal is to have varied building types benchmarked in many different climate zones to prove the level of cost reductions that should be anticipated. This will be valuable information for building owners, managers, utility companies and ESCOs.

The correct answer to the five billion Euro question is within our reach when we focus on energy consumption and energy demand reduction. ROI needs to be an integral part of the planning and then the results anticipated will be the results achieved or exceeded.

REPORTING & STANDARDS

Embedding the UN Guiding principles on human rights and business into a company

Along with the growing interest in global supply chains, such as the implications for businesses linked to the fatal factory collapse in Bangladesh, there is an increasing emphasis on the need for companies to consider their human rights impacts. This includes looking beyond their own operations.



Colleen Theron

Sustainability Lawyer & Consultant,
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The universal endorsement of the UN Guiding Principles on Business and Human Rights (UNGPs) by the EU council in 2013 is arguably a game changer.

The UNGPs provide the first internationally recognized benchmarks against which corporate conduct can be judged by governments, civil society, investors, and victims, and from which formal rules can be developed. Although no new legal obligations are created by the UNGPs themselves, Ruggie has characterized their unanimous endorsement by the UN Human Rights Council as the end of the beginning of the road towards international legal regulation of corporate behavior. As a result, businesses are advised to assess human rights issues as part of their risk management processes.

We have worked with a global events company to develop their sustainability management system under the ISO 20121 framework . In order to develop a sustainability management system that is strategic and delivers value, we worked on how the requirements of the sustainable management system should be fully integrated throughout the organization's business decisions. Supply chain management is central to this integration process, not only for obtaining ISO 20121 certification, but to any business seeking to ensure that they are behaving in a responsible and transparent fashion. Developing a sustainable procurement policy was seen as key, together with addressing human rights issues.

Developing the company's approach to human rights was conducted with the support of a director. Top management and director support is key to ensure that the company is committed to the implementation of procedures under its human rights policy statement and the creation of additional internal policies to reflect the commitments in the policy.

The most basic requirement for a business to fulfil under the UN Guiding principles and meet its responsibility to respect human rights is to put in place a human rights policy statement.

We therefore worked with the client to draft its first human rights policy statement, starting with setting out the headline commitments for the policy.

The challenging part was creating the due diligence processes to support the policy. The UNGPs requires that companies should adopt due diligence business processes to address how they will identify, prevent, mitigate and account for potential and actual human rights abuses. Working with key parts of the business, we looked at how legal documents had to be updated, created guides for the commercial department to facilitate decision making, particularly where the company operates or was intending to start operations in countries with high political risk.

There was also a need to tailor the company's labour policy and address the procurement process. This is intended to have a trickle-down approach, where the key suppliers will check on their suppliers and so forth.

Understanding the Intricacies of the SEC's Dodd-Frank Act

3E Company is widely regarded throughout the industry as a leading provider of product, regulatory and compliance information services that reduce risk across the supply chain. Our customers rely on our regulatory knowledge and robust solution

set. In 2013, we expanded into the emerging area of supply chain product compliance with a special focus on existing and emerging conflict minerals initiatives. As a result, our regulatory experts immersed themselves in the intricacies the SEC's Dodd-Frank Act. Such an immersion was necessary so that we could effectively counsel our customers on how to best adapt to the realities of the US Conflict Minerals law.

This responsible sourcing initiative, passed by Congress, seeks to impede the flow of funding conflict in the Democratic Republic of the Congo and the surrounding region. Unbeknownst to many, a wide range of US companies manufacture products that contain minerals that originate from this region – and unintentionally fund the armed groups and violence.

The US law requires public manufacturers to determine whether they have any of these "conflict minerals" - tin, tantalum, tungsten, or gold - in their products, and if so, perform a supply chain inquiry to determine the country of origin of each mineral and undergo due diligence efforts to determine if the minerals are coming from a source that would aid armed conflict in the covered areas. Industries including electronics, automotive, jewelry, aerospace, and medical devices have been widely impacted.



Kirsten Wallerstedt

Senior Regulatory Analyst,
3E Company
www.3ecompany.com

Engaging with sometimes massive supplier networks on behalf of our customers to uncover this information has been replete with lessons learned. Education and training is a very important place to start. A supplier that understands the obligation is one who is more willing to work with you to ask questions of their own supply chain. Reassurance that the customer-supplier relationship is not at risk is another fundamental necessity if you want to get honest answers from your suppliers, especially in this first reporting year.

Our customers were also challenged to create cross-functional teams and integrated data management systems so that their new workflow processes could incorporate actions taken from various teams including procurement, communications, legal, compliance, IT and others. This new level of cross-departmental coordination is another outcome of the conflict minerals law.

Data maintenance and validation continued to be critically important this year. Conflict minerals pose the challenge of routinely having to check if a supplier that was validated as "conflict free" last year has made any procurement changes themselves this year. Our systems keep up with this type of record keeping and re-validation in order to best support our customers' practices.

One challenge we all now face when it comes to conflict minerals compliance is how to make conforming to this law sustainable. A key lesson that we have implemented is to invest in a web-based product and a supplier outreach program that work together and are scalable to meet future needs of the company. The incredible amount of effort required to inquire of your first-tier suppliers, as well as their sub-suppliers all the way to the source, is something that is best utilized as a foundation to build upon for other emerging supply chain and sustainability and environmental compliance obligations or corporate policy implementation. Investing in technology and people that are able to be leveraged to meet broader compliance programs is a very important takeaway from Year One of conflict minerals compliance, and this lesson can help other companies to plan their investments and strategies going forward into Year Two.

Zero Deforestation the New Norm: Implications for Commodity Supply Chains

Major brands and suppliers have taken tremendous steps to begin driving extraordinary and sustainable change through their supply chains, using their buying power to protect rainforests through zero deforestation commitments. In 2013, due in large part to response to significant NGO and brand pressure, the paper and palm oil industries – including Asia Pulp and Paper and Wilmar - committed to zero natural forest destruction in their supply chains, a groundbreaking commitment previously unheard of in this industry.



Erik Wohlgemuth

Chief Operating Officer,
Future 500

www.future500.org

In announcing its new Forest Conservation Policy (FCP), Asia Pulp and Paper and later Wilmar committed to new industry transparency standards that could, by example, become the model for other commodity industries. Both companies are working with The Forest Trust (TFT), which has built and is refining an online monitoring dashboard to provide NGO watchdogs, investors, and downstream customers data on important measurements; measurements that include high conservation value (HCV) lands and other sensitive regions, forest, community grievances and responses, and maps of forest areas under management in remote parts of the world.

This new model of supply chain accountability and transparency is spreading, and leading brands like Nestle, Unilever, and Staples are reinforcing these commitments. Furthermore, with government often deadlocked, the trend toward market-based solutions will only increase and inevitably spread to other commodity markets that impact forestation -- soya, coffee, beef - and beyond, with global implications for how consumers and brands make their purchasing and sourcing decisions.

The Largest Convention Center Achieves LEED EBOM Gold Certification

In October, 2013, The Orange County Convention Center (OCCC) was awarded LEED for Existing Buildings: Operations & Maintenance Gold (EBOM) certification from The Green Building Certification Institute



Jeff Benavides

Senior Consultant and Project Manager,
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and the US Green Building Council (USGBC). OCCC's North – South Building is the largest convention center in the world to achieve LEED EBOM Gold certification.

We believe this accomplishment was different than other LEED projects because of the significant community and economic impact the three-year process had.

Each year the OCCC attracts more than 200 events to the Central Florida area. As a result, roughly 1.4 million attendees contribute approximately \$2.1 billion to the area's economy each year, and the accomplishment is a significant investment in our county's future.

Additionally, this LEED project sparked the community wide sustainability working group called Green Destination Orlando. This group of private and public organizations focuses on transforming and showcasing Orlando as a premier sustainable tourist destination. Orange County, Greater Orlando Aviation Authority, USGBC Central Florida, Central Florida Hotel Lodging Association, Green Meeting Industry Council, Visit Orlando, and the University of Central Florida

Rosen College of Hospitality Management are among the core stakeholders to the success of this initiative. Founding participants included, Rosen Hotels, Hilton Orlando, Peabody Orlando, Pointe Orlando, and Double Tree at Sea World.

Corporate Responsibility Report Reframes the Commonly Presented Business Case

I imagine that many small and mid-size enterprises (SMEs) still struggle with developing a compelling business case for sustainability reporting. Sunshine Makers, Inc., the company behind the Simple Green line of industrial and household cleaning products,

welcomed me to their team in late 2013 to develop and direct a structured sustainability program. One of our priority projects was the publication of an inaugural corporate responsibility report, utilizing the G4 guidelines recently published by the Global Reporting Initiative.



Constanze Duke

Director of Sustainability,
Sunshine Makers

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Now that the content is nearly complete, I would urge anyone tasked with convincing executive teams that such a report is a worthwhile endeavor to re-frame the commonly presented business case. Yes, a sustainability report can be utilized as a marketing tool and producing a meaningful, transparent document may certainly result in reputational benefits. However, there are far more compelling outcomes to consider, especially for companies moving from the entrepreneurial stage into the strategic growth phase.

For instance, the G4 guidelines emphasize stakeholder engagement, an opportunity for SMEs not yet doing so to engage their customers, business partners, employees and other stakeholders through polls, surveys and discussions. Another critical component is determining which operational aspects are material, a helpful tool when devising sustainability strategy. Furthermore, developing a sustainability report requires collection and interpretation of economic, social and environmental data, development of a management approach for each aspect, as well as gaining in-depth understanding of the value chain. Such knowledge is instrumental for any business, as it forms the basis for continuous improvement and potential product and operational innovation.

In addition, the process of gathering report content is bound to become an internal conversation starter, particularly when documenting a balanced account of achievements, challenges and shortcomings. Moreover, the reporting process forces companies to assess future outcomes they may not otherwise have considered, such as long-term business risks and opportunities from climate change, including evaluation of potential financial implications. And finally, what I perceive to be one of the greatest advantages of a sustainability report is its ability to create

internal accountability at all levels. Once the reported information enters the public space, follow-through becomes a critical aspect of continued credibility.

For companies with established sustainability management systems, a corporate responsibility report essentially assembles data and integrates existing goals and strategy to tell a story, but for the majority of SMEs that are tackling their first report without all the parts already in place, the reporting process is a learning tool, providing the kind of lessons that contribute fundamental business insights in a compact and organized format to shape, focus or redirect corporate strategy. The business case does not amount to the value of a marketing tool, but rather to the value of building a business that will endure.

Ask not what your sustainability report can do for you; ask what you need to do in order to produce a meaningful report.

Achieving Certification Offers Insights into the Way We Think about Sustainability

In 2013, we achieved the Green Seal Standard GS-1 re-certification of Sanitary Paper Products for the entire line of Cascades and North River Away-from-Home towel and tissue products. Cascades Tissue Group has offered Green Seal-certified paper towels since 2005, but in 2011 Green Seal made major revisions to its GS-1 standard and companies were required to be re-certified with much stricter conditions than ever before.



Thierry Trudel

Vice President, Marketing & Communications,
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The GS-1 standard sets the environmental, health, and social requirements for sanitary paper products and comprehensively addresses environmental life-cycle issues spanning raw materials, manufacturing, packaging and product use and performance. The revised standards provided more stringent criteria such as increasing the amount of post-consumer material required by an average of 25 percent, monitoring air and wastewater quality, and expanding product performance and packaging requirements. Products must also adhere to strict requirements related to qualities like weight, strength, absorbency and sheet count and size.

The process leading up to the re-certification gave us better insight into increasingly stringent compliance criteria and was a helpful comparison and benchmark of our own rigorous standards. The priority to focus on environmental health, as well as social requirements, helped to provide a total-picture approach from a compliance standard and further advance the way we think

at Cascades. With the re-certification, we now possess one of the largest offerings of Green Seal-certified towel and tissue products throughout North America today. This re-certification encompasses around 100 branded products, all made from 100 percent recycled fiber.

Responsible Care and Sustainable Development in Indian Fertilizer Sector

Responsible Care was initiated in 1984 by the Canadian Synthetic Organic Chemical Manufacturers' Association. Responsible Care was first conceived in Canada



Ajay Sachdeva

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and launched in 1985 to address public concerns about the manufacture, distribution and use of chemicals. Responsible Care Management System (RCMS) programs were published, implemented, tested by industry experts and academicians over the years, and improved by revisions. American Chemistry Council (ACC) finally published RC 14001 standard in 2002 that got revised in 2005, 2008 and 2013. ANSI National Accreditation Board (ANAB) provides accreditation to Certification Bodies for this standard.

Seven Codes of Responsible Care

India has led the voluntary adoption of this standard outside the US. Fertilizer sector companies Tata Chemicals Limited and Nagarjuna Fertilizers & Chemicals Limited went in for its implementation although they were not a part of ACC and hence, it was not mandatory for them to get certified to this standard. Both these units adopted Seven Codes of Responsible Care:

- » **1. Pollution prevention**
- » **2. Employee health & safety**
- » **3. Process safety**
- » **4. Product stewardship**
- » **5. Distribution code**
- » **6. Community awareness and emergency response**
- » **7. Security Code**

Importance of National Adoption

Adoption is of special importance due to two specific reasons at the national level:

SECURITY THREATS. India has one of the most turbulent law and order situations due to various internal threats like terrorism and Maoist movement. Security code implementation helped companies bring security threat from the corners of “Security Gate to Board Room,” as there were regular reviews, internal and external audits, etc. There was an increased level of investment in the security infrastructure and this led these companies to secure their plants from potential threats. Another benefit of the implementation of this standard was a better coordination and relationship with government security agencies like police force and Coast Guards.

FOOD SECURITY THREATS. India is facing one of the worst threats due to food shortages. Also, farmer suicides are quite common as they continue to be in abject poverty as productivity of the land is hardly increasing. Product stewardship is driving balanced nutrition and each of these companies is reaching out to more than 100,000 farmers, educating them about customized fertilizers and Neem Coated Urea. Also, they are working on organic fertilizers and fertilizers with liquid application. These have become a model for replication. If followed by other companies and supported by government policies, there is a potential that the country reaches a stage where we are able to bring farmer suicides to zero and improve the general public health by providing more balanced nutrition. These are likely to help achieve one of the Millenium Development Goals of India to halve the proportion of population who suffer from hunger from 1990 to 2015 on which the country is slow or almost off-track as per Report of Government of India on “Towards Achieving Millennium Development Goals-India 2013.”

Benefits Reaped

At the organizational level, some of the benefits reaped by these organizations are:

INCREASED SYNERGY. As this standard requires inclusion of head office, it increased the synergy between head office and plant functions. There was greater support for the Environment, Health and Safety functions and resources started flowing to improve the implementation levels.

CONFIDENCE BUILDING WITH SURROUNDING COMMUNITY. The organizations were able to reduce the Trust deficit and develop a stronger and more involved relationship with their neighbors including illegal migrants, disturbing elements, etc

Industry Launches Integrated Conflict Minerals and RoHS, REACH Web Database for Suppliers

The SEC’s conflict mineral rule requires US-listed companies to disclose whether their products contain certain metals (tin, tantalum, tungsten, or gold) and whether these metals originate from rebel-held mines



Aidan Turnbull

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which are funding armed conflict in the Democratic Republic of the Congo (DRC) region. As most SEC reporting companies prepare to file “DRC conflict undeterminable” for the 2013 reporting period, the BOMcheck Industry Steering Group has launched an advanced conflict minerals web database system to prepare for the 2015 reporting period when large SEC reporting companies must file “DRC conflict free” or “Not DRC conflict free.”

Industry's First Web Database

Extensive feedback on data management challenges with other web platforms has helped industry develop the first web database which:

- » **Provides one integrated tool for suppliers to upload their EICC GeSI Conflict Minerals Reporting Templates at the part level or company level at the same time as they publish materials declarations for RoHS, REACH and other regulated substances. No need to re-type data into another web tool.**
- » **Validates the data in the supplier's EICC GeSI Conflict Minerals Reporting Template and provides immediate detailed feedback to help the supplier correct any data validation errors which are preventing upload. This saves time and cost for suppliers and manufacturers.**
- » **Works in partnership with the Conflict-Free Sourcing Initiative to validate any new smelters which suppliers identify so that they can be added to the smelter list and invited to join the Conflict-Free Smelter Program.**
- » **Enables manufacturers to leverage the Conflict-Free Smelter Program and the upcoming EU Responsible Sourcing Regulations to work towards “DRC conflict free” status by 2015.**

BOMcheck is an industry collaboration led by Philips, Siemens, GE, Osram, Sony Mobile, Schneider Electric, Toshiba, Agfa, Texas Instruments and TE Connectivity to share one web database to manage supply chain compliance. BOMcheck is highlighted in corporate videos produced by Siemens and Philips and is currently used by over 560 manufacturers to gather materials declarations from over 3,500 suppliers worldwide for more than 1.6 million parts. The system is supported by SGS which uses BOMcheck to provide EN 50581 RoHS compliance assessment services.

An important lesson learned from company pilot programs was that it took an average of 3 or 4 interactions with suppliers to achieve complete and coherent EICC GeSI Conflict Minerals Reporting Templates. Manufacturers spent considerable time and effort to review each Conflict Minerals Reporting Template and manually communicate the data validation errors back to suppliers. The BOMcheck Industry Steering Group shared the results from their pilot programs to develop a comprehensive set of validation checks and error messages. The new BOMcheck tools carry out these validation checks automatically and provide immediate detailed feedback to the supplier on how to correct any errors before the reporting template is uploaded and shared with their manufacturer customers. This saves time and cost for suppliers and manufacturers.

WATER & WASTE MANAGEMENT

Lessons Learned during Construction of ‘Green’ Infrastructure Projects

Williams Creek’s participation in the construction of various green infrastructure projects has created a wealth of knowledge and “lessons learned” that can be utilized in

future projects. Two examples are the Central Greens project in Indianapolis and North Street Reconstruction in the City of Lafayette, IN. Central Greens included installation of pervious concreted curb and gutter, and pervious sidewalk to allow for stormwater infiltration. Several key lessons were learned regarding contractor selection and proper installation of pervious pavement through this project. Future contractor selection for similar projects should require a test pour prior to the field installation, given the significance of “proper pour” when utilizing this green infrastructure technique. Temperature during the pouring process is a critical factor for the long-term success of pervious pavement and precautions must be taken to immediately seal off the pour to make sure it is airtight when it cures.

The North Street project in Lafayette reconstructed one of the City’s 12 historic brick streets and included replacement of 11,000 square yards of existing impervious brick roadway surface with permeable pavers and subsurface stormwater storage. The specification for this project required the construction contractor to use washed stone for the subsurface layers, but did not require periodic testing of the stone throughout the project. Future phases of the project should require a testing parameter for stone at certain intervals. Coordination with utilities was particularly important on the project because unknown conditions are more likely to be found under older streets. The project team took advantage of institutional knowledge from City staff to verify utility markings and anticipate unknown conditions. The North Street project also required close coordination and consistent communication with adjacent property owners.



John Hazlett

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Halton Diverts More Waste through New Management Programs

The Regional Municipality of Halton (Ontario, Canada) serves more than 500,000 residents, and is committed



John Watson

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to meeting the needs of its residents through the delivery of cost-effective, quality programs and services, including waste management.

Halton Region's 2012-2016 Solid Waste Management Strategy identifies the expansion of Blue Box materials, enhancing Blue Box capacity and the implementation of a three garbage bag limit as key factors in achieving the overall strategy goal of 65% residential waste diversion, an increase from the current residential waste diversion level of 60%. In addition, these changes will also help to extend the life of Halton's landfill site by an additional four years to 2044.

On April 1, 2013, Halton Region implemented new waste management programs including new Blue Box materials (mixed plastic packaging, cardboard cans, metal paint cans), new larger Blue Boxes (22 gallons), decreased the garbage limit and introduced garbage tags.

This waste collection system rewards residents who use their Blue Box for recycling and GreenCart for food waste composting regularly, while targeting those residents who are not yet using the diversion programs to their fullest. These program changes were promoted through a communications campaign, "Look What's New In Blue," which focused on the positive benefits of recycling more materials to reduce garbage. The change management plan and communication plan included clear goals, objectives, key messages, and identified metrics and evaluation tools.

"Look What's New In Blue" incorporated a robust set of communication tools. Branding, images and key messages were consistent throughout all the communication tools. New Blue Box acceptable materials were depicted as photographs as opposed to drawings to make them more relatable to residents. Communication tools targeting residents in single-family homes were systematically deployed to reinforce key messages supporting the program changes.

Directly to their homes, residents received:

- » **WasteLess News – December 2012**
- » **Waste Management Guide & Collection Calendar – January 2013**
- » **WasteLess News – February 2013**
- » **Direct Mailer – March 2013**

These targeted communication tools were supported by the deployment of mass advertising, including billboards, movie theaters, malls, back-of-bus, and print. This in turn was supported by online advertising, media relations and social media (Twitter, YouTube, blog).

The Direct Mailer, sent to all houses as unaddressed admail, contained a peelable and usable Blue Box acceptable materials sticker, and one peelable and usable complimentary garbage tag. This enabled Halton to promote the positive aspects of these program changes; and by providing just one complimentary garbage tag, Halton offered exceptional customer service without causing a "panic" that residents would need many garbage tags to manage their garbage. The budget

for this communications campaign was \$376,147, or \$2.50 per household. “Look What’s New In Blue” received financial support from the Continuous Improvement Fund.

These program changes were further promoted through public events where the new 22-gallon Blue Boxes were available to residents for pick-up. In March 2013, eight Blue Box Pick-up Events were held at which 40,000 Blue Boxes were given away. In August 2013, four events were held at which 6,000 Blue Boxes were given away.

To help residents ease into the reduced garbage limit and garbage tag programs, from April 1 to September 7, garbage tags were complimentary. Starting September 9, 2013, the garbage tags cost \$2 each. During both phases of the garbage tag program, residents could pick up or purchase garbage tags at select municipal facilities, retailers and online.

Halton Region used a number of evaluation tools to gauge the effectiveness of this campaign, including curbside participation study, residential waste audit, tonnage reports, call and email volume, website traffic, and number of residents participating in Blue Box Pick-up Events.

Since the new programs started, curbside participation has improved:

- » **Weekly Blue Box participation increased from 95% to 97%.**
- » **Weekly GreenCart participation increased from 70% to 72%.**
- » **Use of three garbage bags or less increased from 85% to 95%.**

From April to December 2013, Halton Region collected 6.9% more Blue Box and GreenCart materials and 3% less garbage, compared to the same time period in 2012. Halton experienced higher than average phone and email volume during the implementation of these program changes. Interaction with residents through social media platforms was positive and supportive.

By highlighting the positive aspects of recycling and composting, Halton Region effectively encouraged its residents to divert more waste.

5 Key Questions to Ask When Starting Recycling Program

Measuring consumer accessibility to recycling locations has never been standardized, but it is a mandatory first step in improving collections. Accessibility, in the world of recycling, is the access that consumers have to recycle products after their useful life.



Carl Smith

CEO and President,
Call2Recycle
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We know that though consumers have many options for recycling—from curbside pick up to municipal collection events, recycling centers to retail store kiosks—there are limitations. Whether based on the material the consumer wants to recycle or the consumer's proximity to a collection site, these limitations in collections are due to accessibility and convenience. According to a 2012 IPSOS survey, the most frequent reason given for not recycling more was inaccessibility or inconvenience of recycling facilities. Improving access will, naturally, improve recycling rates.

While critical evaluation of accessibility for any collection program must consider a variety of material-specific nuances – including municipal limitations, hazardous materials guidelines, material size, etc. - every program should start by answering these five key questions:

- » **IS THE RECYCLING CENTER HOSTED AT A CONVENIENT LOCATION?** Consumers see curbside and kiosk recycling as the most accessible and convenient options. With this in mind, recycling centers should be located where consumers visit on a regular basis so recycling becomes a quick and easy part of regular shopping trips.
- » **HOW MANY MATERIALS CAN BE DROPPED OFF/COLLECTED AT THE CENTER?** When multiple materials can be dropped off at one location—such as paint, batteries, CFLs, and plastic bags—recycling becomes much easier for the consumer. Compare a single-stop option for recycling to the challenges of traveling to separate recycling locations.
- » **HOW MANY DROP-OFF/COLLECTION SITES ARE THERE AND WHERE ARE THEY LOCATED?** The number of options and proximity to home make the difference between whether a consumer will or won't recycle.
- » **IS THE DROP-OFF KIOSK OR CENTER EASILY VISIBLE?** Collection centers that are out in the open, with good signage, are easy to identify and access.
- » **WHAT ARE THE HOURS OF OPERATION?** Collection sites that operate on limited days or hours do not offer the flexible, convenient drop-off options consumers need.

Three Key Steps

As North America's first and largest battery stewardship program, part of Call2Recycle's mission is to positively impact recycling efforts by making it convenient and easy to recycle consumer batteries. To accomplish this, we measured consumer access to its collection sites. This revealed the percentage of the US and Canadian population with access to a battery and cellphone collection location through the Call2Recycle program, which operates through a network of 34,000 collection sites across North America. The methodology behind the metric includes three key steps:

STEP 1: DEFINE A PUBLIC-FACING COLLECTION SITE. Each collection site within the Call2Recycle network has the option to be a public or private collection point. Those that choose to participate in the program are identified and advertised on the company website under the

“Drop-Off Locator” tool. This network of advertised public collection sites is what the organization defined as its public-facing collection sites.

STEP 2: IDENTIFY PUBLIC COLLECTION SITE PARTICIPANTS. We allow any organization to collect from the public, however the vast majority of public collection sites are retailers, other businesses, and municipal drop-off points, such as a recycling center or library.

STEP 3: ANALYZE COLLECTION SITE NETWORK. Using the center of the geographic zone as a guide, an analysis (via mapping software) determines the population that resides within a given radius of a collection site. Call2Recycle applies a 10-mile radius when analyzing accessibility, which is conventionally accepted as the appropriate radius, validated by a third-party qualitative research partner in 2011, as a reasonable distance people may drive to recycle. The population total derived from this radius is aggregated and then divided by the population totals of larger geographic sets (market, state, country) to determine coverage levels.

The results revealed that 91 percent of US and Canadian residents have access to a Call2Recycle battery recycling or drop off center within a 10-mile (15-kilometer) radius of their homes.

With insights like these, any organization with a recycling program can identify areas that are underserved and prioritize where time, money and effort should be invested in education and establishing collection sites. Paired with demographic data, the results can be used to deliver more targeted communications with niche audiences. And, product stewardship organizations can better meet the needs of diverse consumer groups, such as those living in urban versus rural areas. Identifying and then filling gaps in accessibility can mean the difference between success—through increased collections and recycling—and failure.

With more than 322 million wireless devices (phones, tablets, and e-readers) in use in the U.S. alone—all powered by rechargeable batteries—recycling both the battery and the device are more important than ever before.

National Water Quality Initiative

MillerCoors’ strategic partnership with Trinity Waters has evolved into the National Water Quality Initiative (NWQI) model, bringing conservation projects on the ground all year around. Originated in the Texas’ Trinity River Basin with a handful of pilot projects in 2012, this initiative currently encompasses about 100 landowner contracts, servicing more than 25,000 acres of land while leveraging almost \$6M of funding committed from the Department of Agriculture’s Natural Resources Conservation Services (NRCS).



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Collective producer and public benefits are achieved through a multi-stakeholder approach including the federal government, NGOs, academic institutions, and corporations. This partnership offers financial and technical assistance to farmers, ranchers and forest landowners interested in improving water quality and aquatic habitats in priority watersheds with impaired streams.

We believe that water stewardship is critical in creating “America's Best Beer Company.”

Shooting for Zero: How the Waste Management Phoenix Open became the Greenesh Show on Grass

On the surface, it sounds like a daunting goal: Turn a week-long PGA TOUR event, attended by a half million golf fans in the Arizona desert, into a symbol of



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sustainability with zero waste and 100% diversion of all materials from a landfill. Not only has the challenge – officially the Zero Waste Challenge – been attained, it's also become a tradition, first reached in 2013 and repeated in 2014.

So how did it happen? Like most big goals, the key to getting there didn't hinge on one big idea or breakthrough moment. Instead, achieving zero waste revolved around many things – coordination among teams, advanced planning, communication, education and detailed metrics.

The first step was coordination. While managing the logistics of any PGA TOUR event would be ambitious enough, the challenge became even more involved with the zero waste goal added to the mix. This brought together both operations and sustainability team members, first at a high level and soon cascading down through all executional aspects. It included decisions on where to place recycling and compost bins (6,000 in all), how to remove materials each night after fans and players left the grounds, and which facilities to utilize for recycling, composting and recovery. These decisions weren't made in a vacuum; instead they had to be made with their impact on other factors and stakeholders in mind – security, traffic flow, fan comfort, broadcast television logistics and, of course, the golf competition itself.

To turn the goal of zero waste into a plan, team meetings brought together all constituents in focused planning sessions beginning almost as soon as the previous year's tournament ended. Metrics were reviewed, processes identified, suppliers contacted, solutions debated and appropriate partners brought onboard.

As the 2014 tournament got closer, more detailed elements and action plans took shape. One in particular was a document establishing “Guidelines for Acceptable Materials.” It provided a broad, yet detailed reference that put everyone on the same page when it came to knowing what could – and couldn’t – be brought onto the course in the first place. Recycling and composting material streams were clearly defined upfront, with specific examples for added clarity. This definitive listing was further expanded with detailed sections covering individual areas – food and beverage service supplies, giveaway items, printed items, signage and décor.

More than a prescriptive document, the guidelines often led to bigger, process-driven solutions. In the case of ketchup and mustard packets, for instance, the solution wasn’t found in sourcing a

"The real beauty lies in the fact that it's a story that can be repeated.

new type of material but, instead, in creating a new approach. In this case, condiment packages were replaced by pump-based dispensers that eliminated the need for packaging. By ensuring the patrons only used what they needed, the potential of added savings through less consumption became a secondary benefit.

Open dialogue was another key to success. For example, communicating with tournament vendors – early and often – was a priority. This allowed plenty of time for issues to be addressed and materials ordered without the stress and difficulty of a looming deadline. In many cases, vendors worked together to identify and source materials. Another key factor came in the form of the Zero Waste Participation

Agreement, inserted as the last page of the Acceptable Materials document. The lesson here was simple – asking for a signature reinforced the document’s importance and made achieving zero waste an inherent part of the tournament’s DNA. Adding to the story was the ever-present backing and support of the tournament’s host organization, The Thunderbirds.

As the late-January start date approached, Waste Management’s sustainability and operations teams circled back to all vendors, answered questions and were available to address concerns before they escalated into something larger.

In the end, the road to zero waste was smoothly navigated by all parties involved – Waste Management, the PGA TOUR, The Thunderbirds, vendors, sponsors, players and, of course, more than 560,000 fans. And the real beauty lies in the fact that it’s a story that can be repeated – at other sporting events, on college campuses and in cities and towns throughout the country.

New Food Scrap Composting Facility ‘Closes the Loop,’ Plans to Bag Compost for Sale in Local Stores

In November 2013, the Onondaga County Resource Recovery Agency (OCRRA) opened the largest food scrap composting facility in New York State. The

\$2.4 million Aerated Static Pile compost system is designed to process over 9,000 tons of local institutional and commercial food scraps a year, and will ultimately generate over 30,000 cubic yards of premium compost annually. Compared to a windrow method, OCRRA's ASP system reduces the processing time by 60%, from nine months to less than 90 days for finished product. The facility was designed by engineers in GHD's Cazenovia, NY office.

OCRRA's new Amboy compost facility is already processing over 50,000 pounds of food scraps on a weekly basis, all of which are turned into a soil amendment that meets the United States Composting Council's Seal of Testing Assurance (STA). The material is sold back to the community for use in gardens and landscapes, as well as for such green projects as "green roofs" and wetland construction. The list of local commercial and institutional generators sending their food scraps to the Amboy Site for recycling into nutrient-rich compost is long and growing: Byrne Dairy, restaurants throughout Destiny USA shopping/entertainment center, LeMoyne College, Marcellus School District, the OnCenter, Onondaga Community College, Pastabilities Restaurant, Paul De Lima Coffee, Syracuse Ramada Inn, St. Camillus Senior Living Center, SUNY Upstate Medical Center, Crouse Hospital, Community General Hospital, Syracuse University, the Sheraton Syracuse University Hotel and Conference Center, Syracuse Banana, and Wegmans super markets in Onondaga County are some of the early adopters.

The project is squarely aimed at meeting OCRRA's vision of "maintaining a world class solid waste management system that makes our community a more sustainable, healthier place to live." Currently, the community disposes over 30,000 tons of food scraps annually. OCRRA's food scrap compost system will help reduce those waste totals, and "close the loop" by recovering organic resources currently in the waste stream to generate a premium soil amendment that returns valuable nutrients to local soils.

In 2014, OCRRA will start bagging the 1/4" screened compost for sale in local garden stores throughout Central New York, in addition to selling the material in bulk at the compost site.

OCRRA is a public benefit corporation that manages a comprehensive solid waste, recycling, and composting system on behalf of the businesses and residents of Onondaga County, NY; Syracuse is the major metropolitan area.



Greg Gelewski

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Tennessee City Turns Trash into Dollars

In Covington, Tennessee, Mayor David Gordon saw that his city was spending a lot of money taking biomass materials to the local landfill. The mayor wanted to find a way to stop the waste and be greener overall.



Mike Webb

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After he started researching renewable energy, he contacted PHG Energy. PHGE was able to install a gasification plant adjacent to the city's wastewater treatment facility. By doing this, the mayor is able to eliminate tons of tree trimmings and wastewater sludge from the local landfills and save the costs associated with that.

"I set out to find a way to utilize the waste our community generated," Mayor Gordon said. "And we had to make a positive economic case while we were helping our environment. With this project, we have been able to literally turn trash into dollars."

The new system will not only keep material out of the local landfill, it will also eliminate the release of more than 450 tons of carbon dioxide into the air each year, according to information provided by the Environmental Protection Agency.

Triple Bottom-line Growth Comes from Reducing Waste, Improving Efficiencies, Repurposing Items

A combination of a rigorous approach to measurement, company-wide initiatives and strategic partnerships with organizations around the



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world is key for hotel companies striving to meet waste reduction goals.

In 2013 we launched RePurpose, our comprehensive waste program to support hotels in finding new and scalable ways to dispose of waste through recycling or donating items instead of sending them to landfills. By thinking creatively about how to manage waste, RePurpose helps our hotels achieve triple bottom line results by reducing their impact on natural resources, reducing the cost of waste disposal, and supporting the communities where we live, work and travel.

When you look at waste, everything has the potential to be RePurposed: reduced, reused or recycled. For example, food and beverage teams can look for creative ways to reduce portion sizes and purchase less food by tracking what is thrown away without impacting the guest

experience. When waste is generated, much of it can be reused to minimize the impact on the environment and surrounding communities. Hotels around the world are already finding ways to reuse items by using them for another purpose internally, such as using old towels for cleaning, by supporting community organizations with donations of used office equipment or even ongoing food donations to a local food bank. And when waste cannot be reduced or reused, you can always look for ways to recycle. In addition to working with local recycling organizations and government agencies to recycle common materials, many hotels have gone above and beyond, such as turning food scraps into compost for community gardens and recycling soap for use by communities at high risk of sanitation or hygiene-related diseases.

To realize our waste reduction goals, we sought the additional support of experts in the field in areas that were material to our waste operations including Good 360, Global Soap Project, Feeding America and Global FoodBanking Network. Each of these organizations offers insights to help drive processes and systems necessary to implement varied waste programs.

Since 2011, more than 700 properties have contributed over 270,000 pounds of soap to Global Soap Project and other recycling organizations, which has been processed into over one million new bars of soap. In addition, we have recycled over 9,200 mattresses from 14 hotels and our hotels donated more than 17,000 pounds of food, equivalent to over 16,500 meals.

Through our waste reduction efforts we've identified the opportunity for triple bottom line performance: reducing waste in our operations can lead to less impact on the environment, improving efficiencies can result in cost savings for our company and repurposing items through donations can benefit our communities.

Best Practices, Innovation Opportunities from Zero Waste to Landfill Program

In 2012, Bridgestone Americas' Manufacturing Group (BAMG) set the internal goal to reach "Zero Waste to Landfill" across all tire manufacturing plants



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across North America. We charged a team member with visiting each plant and doing the following meticulous activities: interviewing the plant environmental engineer for best practices, touring the production systems to generate new innovation opportunities, and investigating local/regional technologies and services that could improve on tire material recycling.

The result of this investigation yielded 27 Best Practices and 36 Innovation Opportunities, which were shared across the plants. The plants were then challenged to reach Zero Waste to Landfill. By the year's end, the Aiken, SC, passenger tire plant became the first plant to achieve Zero Waste to Landfill. In 2013, two additional plants reached Zero Waste to Landfill, including our Wilson, NC, plant which recently became the world's first UL Environment certified Zero Waste to Landfill plant.

This project demonstrates the value of friendly internal competition, sharing of best practices and new opportunities, and investing in thorough documentation of systems and processes.

No Chargers with New Phones: Risky Initiative with Positive Results

At O2, we have made a commitment to no longer offer a charger with a new phone as standard by 2015. This is one of the 40 commitments in our three-year sustainability strategy, the Think Big Blueprint.



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Sustainability Coordinator,
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www.o2.co.uk/thinkbig and www.telefonica.com/en/corporate_responsibility/html/home/home.shtml

There are an estimated 100 million unused chargers in the UK alone and they have a huge environmental cost. With an estimated 30 million new phones purchased annually in the UK, each one with a charger included, the problem is only set to grow. Considering that standardized chargers have been on the market for several years and the majority of phones sold are upgrades, it is likely that many people will have compatible chargers at home already. In fact, our research tell us that as many as 70% of customers already have suitable chargers – highlighting that you don't need a new charger every time you purchase a new phone.

By no longer offering a charger as standard, not only are we reducing the amount of waste sent to landfill, we're also reducing the amount of resources used in the manufacturing and packaging process as well as the amount of fuel used for transport. Though despite this research and the clear environmental benefits, taking the charger out of the box was a move that customers initially struggled to come to terms with. Initial consumer research showed that 95% of customers expect to receive a charger when they purchase a phone; it's a core part of the purchase, not just a peripheral. Customers were concerned about:

- » **How to charge their phone if they do not already have a charger**
- » **The cost of purchasing a charger if they did require one**
- » **Whether this was just a way for O2 to make more money**

These are valid concerns but we felt that O2 had a duty to lead in an environmentally responsible way and help our customers to do so, too. By being the first network operator to do this in the UK, perhaps even the world, our leadership had the potential to shake up the industry and drive lasting change. Although the majority of customers were nervous about the concept when initially briefed, many changed their minds once the environmental benefits were explained, with only 24% of customers remaining skeptical of the idea.

"Without this initiative there would have been over 100,000 unnecessary chargers on the market, contributing to the 100 million already lying around in UK homes and offices.

As part of this initiative, phones still come with a micro-USB to USB cable, suitable for charging with any USB compatible charger plug or from a desktop or laptop. If customers find that they really do need a charger, we can provide them with one at a discounted price – highlighting that O2 do not profit from selling the charger separately.

We trialed this initiative in October 2012 in partnership with HTC for the launch of the HTC One X+, the first mobile phone sold without a charger. Despite the fact that initial market research suggested this move might not be warmly received, in reality we saw some tremendous results with 82% of customers choosing to purchase this phone without a charger plug; smashing our original target of 70%. It has been over a year since the trial and we have now partnered with 4 more manufacturers, including Nokia, Sony, Alcatel and Motorola, launching a total of 12 different phones without a charger included. On average, over 85% of customers choose to purchase these phones without taking a charger.

Without this initiative there would have been over 100,000 unnecessary chargers on the market, contributing to the 100 million already lying around in UK homes and offices.

Taking the charger out of the box has also led to a reduction in the packaging of our phones. One example is the HTC One, which saw a packaging reduction of 24%

upon removing the charger plug. Taking the charger out of the box was a challenging step, not to mention an alien concept for some customers to start with! We kept the environmental benefits at the heart of this initiative, making sure our customers understood our reasons for doing it. Ultimately it has been a huge success. This is the first time that any UK based network has been bold enough to take this step and we hope that our leadership will shake up the industry.

Going Back to Basics Leads to Better Waste Management

Waste costs can take up a substantial portion of a company's operating budget. More often than not, businesses end up paying more for waste removal than they should, simply because they are using inaccurate waste data. What we have found is that paying attention to how much is being thrown away goes a long way in keeping waste removal costs low.

The catch is trash is messy and it isn't metered like electricity or water. To deal with this problem, Great Forest consultants began brainstorming ways to measure overall waste and recycling volumes more accurately on an ongoing basis.

The first ideas involved using electronic rangefinders, cameras, or scales on the garbage trucks. High tech bins were also considered, where bin fullness is measured by remote technology. But surprisingly, the technique we found most effective was the simplest: recording bin fullness with a paper and pen.

We call it Open Top Container Logs (OTCLs), and we started using this system in the DC region last year. The data we gathered was so beneficial in providing Great Forest consultants with accurate information to monitor waste volumes that we will be expanding the program to more than 100 buildings this year.

Every building we have used the OTCL system in has either reduced their waste costs, obtained a more accurate diversion rate, and/or improved the efficiency of their waste and recycling program.

The simplicity of the OTCL system means that implementation is also easy. Moreover, it makes use of existing resources, in this case, the building's existing cleaning crew.

Here's how it works: Great Forest trains cleaning crews (in both English and Spanish) to accurately gauge container fullness using simple measurement guidelines we developed, and to record their observations in OTC logs, which only take seconds to complete.

The data is used to adjust service levels to maximize efficiency of the company's waste and recycling program. For example, if OTCL data shows that a container is consistently only 50% full when it gets picked up, Great Forest consultants will adjust the waste metrics and reduce hauler service levels to save money for the company. If the container is consistently piled-high, we increase hauler service to prevent overflow and costly double-pulls.



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Magdalene Sim

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By involving the cleaning crew, we are also opening another line of communication, allowing us to identify and address any waste and recycling issues quickly, and avoid misunderstandings. Moreover, the cleaning crews we worked with told us they are happy with the system as it is an easy way for them to add value to the services they provide.

Silk's 'Reunite the River' Installation Boosts Awareness of CO River Depletion

The Silk brand, known for its bestselling soymilk, almondmilk and coconutmilk, was founded on a promise to make the world a healthier place. One way Silk is



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working to fulfill this promise is by advancing its water conservation efforts. Specifically, Silk has had a decade-long partnership with the Bonneville Environmental Foundation (BEF) to offset resources used in manufacturing, beginning in 2003 with renewable energy certificates (REC). In 2013, Silk expanded the partnership to include offsets of water resources, with a goal of balancing 50% of its manufacturing water footprint. To reach this goal, Silk invested in water restoration certificates (WRC) from BEF and became a charter sponsor of the Change the Course campaign - an ongoing effort to conserve freshwater and preserve the ecological health of the heavily dammed, diverted and overused Colorado River Basin. This collaboration of BEF, the National Geographic Society and Participant Media is designed to empower individuals and communities to reduce their own freshwater footprint while Change the Course sponsors and collaborators implement on-the-ground water restoration efforts.

Anchoring Silk's support for Change the Course was an urban art installation event held in Chicago on June 26, 2013. The event centered around the unveiling of a 3D art installation in downtown Chicago titled Reunite the River. The expansive 32' x 64' Reunite the River installation, created by world-renowned 3D pavement artist Kurt Wenner, was a visual representation of the depleted Colorado River created to raise awareness of freshwater issues and encourage the public to pledge to reduce their personal water consumption at ReuniteTheRiver.com. For every pledge, 1,000 gallons of water is restored to the Colorado River through projects supported by Change the Course and its sponsors, including Silk.

Silk chose to hold the Reunite the River event in Chicago to create awareness of the depletion of the Colorado River across the country, not just in areas that depend on it for freshwater needs. By placing the installation in a city like Chicago that is not directly dependent on the Colorado River, but that also faces freshwater issues, Silk sought to demonstrate why and how water conservation is a national issue.

Rather than simply describing the importance of water conservation to Americans, Silk saw an opportunity through this event to show the impact of freshwater consumption. Through a visual representation of the dire circumstances facing the Colorado River, Silk was able to bring the issue to life in a way that was not only innovative and engaging.

The Reunite the River art installation was hugely successful in raising awareness of water conservation efforts nationwide, as evidenced by widespread national media coverage of the event. In total, news of the event reached more than 27.8 million people through news outlets such as: National Geographic, Huffington Post, WGN-TV Chicago and the home page of Reddit.com. Perhaps most importantly, through the 1,341 online consumer pledges to reduce water consumption on ReuniteTheRiver.com, Silk was able to help restore over 1.3 million gallons of water to the Colorado River.

While Silk has long been committed to water conservation efforts, the majority of the brand's past efforts had been focused internally on reducing Silk's water consumption and environmental impact. With the Reunite the River installation and event, for the first time, Silk provided an opportunity for consumers to become directly engaged in the issue.

We recognize that there's still more work to be done. As part of our ongoing commitment to water restoration, Silk has committed to balancing its manufacturing water footprint by 100 percent in 2014 through the purchase of WRCs and offsetting with RECs 30 percent of its electricity footprint from manufacturing at its company-owned facilities.

Yellowston's Ecosystem-wide Recycling Program Takes Waste from One Source, Uses for Another

Yellowstone National Park and its private- and public-sector neighbors had urged visitors and residents to join in reducing the use of plastic bottles and create an ecosystem-wide recycling program. As a result, we've diverted more than 40 tons of plastic bottles a year from one of the last,

nearly intact, natural ecosystems. The problem was that the bottles were going overseas and likely coming back to the US in remanufactured products with unknown environmental impacts. I wanted to partner with a US company that would find a new use for those bottles in America.

We asked the United Soybean Board (USB), which represents US soybean farmers, for ideas. USB had a long and successful history developing innovative environmental best practices with Universal Textile Technologies (UTT) of Dalton, Ga.



Jim Evanoff

Retired Environmental Protection Specialist/Environmental Consultant,
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In 1998, with funding from USB, UTT began work on a new manufacturing process to create a carpet-backing product from eco-friendly materials that would not compromise carpet performance. With strong support from the owners of the company, this task force launched UTT into multiple environmental fronts. UTT's new manufacturing process decreased raw material waste and replaced a portion of the petrochemicals in its BioCel, EnviroCel and EnviroCel Home carpet backing with polyols made from US-grown soybeans. The backings also contain Celceram, a waste by-product of the coal combustion-to-energy process, and include post-consumer polyethylene terephthalate (PET) made from plastic bottles.

"The mantra at Yellowstone is that nature has the perfect waste system because waste from one source is always used by another.

As a result, millions of Americans stand each day on flooring that replaces petroleum-based ingredients with recycled bottles and renewable soybean oil. AstroTurf, a UTT sister company, has put the backing on sports fields at every level, from professional stadiums to Little League fields in New York City's Battery Park. Building owners are expanding their livable space, saving water and earning LEED points by installing SYNlawn artificial turf with UTT's backing. Pentagon staffers walk across door mats backed with it, as do employees and guests at many hotels, churches and other federal buildings.

With USB support, UTT and Signature Accord solved our bottle problem and formed a partnership that serves as a sustainability model. UTT purchases Yellowstone's recyclable plastic bottles and grinds them into fine particles that combine with soy polyols

to create the high-performance backing system. Signature tops the backing with carpet fibers made of 100 percent regenerated solution-dyed nylon by Aquafil USA to create the Yellowstone Collection. The company says it is the industry's only product that is 80 percent green by weight. The collection is used in corporate, hospitality, education and healthcare settings, and the first LEED Gold-certified restaurant in New York City—the Harlem Applebee's—installed the carpet in spring 2013.

The mantra at Yellowstone is that nature has the perfect waste system because waste from one source is always used by another. Our collaboration with USB, UTT and Signature Accord keeps plastic bottles out of US landfills, creates new uses for soybeans that are important to the economies of rural communities and helps ensure Yellowstone's future. For every square yard of carpet purchased, Signature Accord and its partners donate 50 cents to the Yellowstone Park Foundation's sustainability.

Signature also helps its customers see their role in recycling by giving a certificate that calculates the environmental benefits based on the yardage of the purchase.

The Purpose of the Recycling Plant

The purpose of Star International Construction and Demolition Waste Crushing Plant Project is to segregate and transform the C&D wastes for obtaining ballasts and filling materials, and thereby reusing and recycling the waste for conservation

of natural resources and fulfilling the rising demand of building materials. Therefore, a careful review of the requirements and the process needed was done to select the best option and latest state of the art technology.

The project is also unique in nature in processing two different types of materials depending on the degree of contamination, i.e.: construction and demolition waste mixed with other wastes like metals, plastics, etc.; and “clean” construction and demolition wastes/road excavated waste.

The C&D and road excavated waste is being delivered to the crushing plant by different operators, collectors and transporters of these wastes. The final products are four different sizes of aggregates, recycled steel, plastic, paper, wood etc.



Hafeez Ul Rehman

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The Process

The process is started with the inspection of waste carried by the vehicle, and only authorized waste is allowed to enter in the facility. Weighing is done at the gate and necessary information is recorded depending on type of waste. Oversize (more than 200mm) waste are broken into small pieces by jackhammer before loading into primary/ secondary feeder. Steel is removed through a powerful electromagnetic system and other impurities such as wood, paper, and plastics through manual segregation at sorting cabin. Different size of aggregates are then screened through trommel and vibrating screens. Aggregates with more than 80mm are subject to further sorting in the secondary sorting cabin and subsequently crushed through impact crusher to produce sizes of desired aggregates. After crushing, aggregates also pass through a magnetic separator to remove embedded steel before screening through vibrating screens. Finally aggregates of different sizes are stockpiled under conveyor belts and then transferred to stockpile area.

Role in UAE Economy

The economy of the United Arab Emirates (UAE) is primarily being fueled by the country's oil sector, as it represents more than one-third of its GDP (as of 2005). In an effort to diversify

its economy, the country has embarked on trading, financial and technological industries, and recently tourism. This has resulted into a massive construction boom. As a consequence, the demand for building materials such as ready mixed concrete, reinforced steel and stone cladding rapidly increased. The mining sector of the UAE is also playing an important role to meet the current demands for building materials. The quarries and crushers companies based in the Emirate of Fujairah and Ras Al Khaimah are currently supplying the limestone to meet the demand in the country. Due to the vast growth in construction and other infrastructural activities in the UAE, especially with the recently-announced developments in the Abu Dhabi residential and commercial sectors, the demand for building materials is expected to be doubled.

It was estimated that fulfilling the future demand of the material which will be taken from the rocks, and the process itself, will lead to the devastation of natural or non-renewable resources. Subsequently, due to the demolition process, more construction and demolition waste will be produced, which if not reused, will increase the burden on landfill, apart from other associated factors such as buying a virgin material at high cost (economic reasons), transportation of C&D waste to landfill (economical as well as environmental reasons) and pressure from the environmental agencies to look for alternatives to promote environmental sustainable development.

Lesson learned: The project provides sustainability and conservation of natural resources in many ways: Re-using and recycling C&D debris enhances carbon footprint initiatives and minimizes the disposal of C&D debris to landfill (preservation of natural resources); the project fulfills the rising demand of aggregates, generating from C&D debris in controlled and environmentally safe, flexible, and economically viable manner and helps reduce devastation of mountains.

Since the beginning of the project, 678,487 tons of C&D waste is received and processed. The final crushed aggregates are also approved by Al Ain Municipality for its usage.

Irrigation Water Use Conservation Project

Airbus Helicopters, Inc., (AHI) identified irrigation water use at our Grand Prairie, Texas site as a concern in 2012 during development of our ISO 14001 Environmental Management System. AHI established a goal of reducing irrigation water use by 25% for FY 2013. AHI implemented a water conservation project using the following approach:



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- » **Installed a new computer based irrigation system controllers that utilized weather data and evapotranspiration rates to control water use.**
- » **Hired an outside water conservation consultant to evaluate our irrigation system and recommend improvements to the irrigation system layout,**

identify areas of broken or improper operating equipment and recommend improvements in landscaping to reduce water use.

- » **Implemented changes to the landscape program to utilize drought tolerant plants and grasses and discontinued winter landscaping features.**

AHI was able to beat our goal of 25% reduction in irrigation water use using the above approach. Total irrigation water use for 2013 was 4.5 million gallons less than 2012 for a total savings of 30% resulting in cost savings of \$15,800.

ALTERNATIVE ENERGY

Verdafero helps UK based BS Holdings' customers save (and make) money with the Renewable Heating Initiative

The Situation

In 2011, the UK government introduced the Renewable Heating Initiative (RHI), the first of its kind in the world. The RHI is set up to encourage uptake of renewable heat technologies among householders, communities and businesses.

The UK Government expects the RHI to make a significant contribution towards their 2020 ambition of having 12 percent of heating coming from renewable sources.

BS Holdings, a supplier of advanced heating and air handling equipment, systems and support to private, public and commercial customers in the UK and Ireland, became aware that over the last few years, as they installed more and more bio-fuel heating systems across multiple clients, it was increasingly difficult to effectively monitor and track the usage and costs of the heating systems to accurately record and receive payment for carbon reductions through the newly introduced Renewable Heating Initiative (RHI).



Alastair Hood

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The Verdafero Solution

San Francisco-based Verdafero offers an SaaS dashboard allowing organizations to visualize on the same page their entire utility expenses, including electric, gas, water, waste, fuel and carbon footprint tracking, across their entire organization.

“As an example of how Verdafero helps us drive our business, the RHI rebate can almost cover the cost of the heating fuel for a business. Having the ability to now capture, analyze, visualize and report the usage and costs from each bio-fuel installation across multiple client sites spread across the whole of the UK without having to visit each site individually is of vital importance to our business,” said Eddie Allen, general manager of BSH. “We can now do this from the comfort of our computer. Up until now, utility expenses have been seen as something that are fixed and a cost of doing business. Now, with the greater insight provided by Verdafero, the user and importantly BS Holdings have the data at their fingertips and can quickly and efficiently alert the

customer to any potential problems, show how each installation's operations compare to others and importantly help the customer reduce their overhead expenses.”

BSH uses the system to accurately calculate the RHI metrics. Being cloud-based the company can use Verdafero's platform while on the road at the customer's site.

Renewable Energy Shift Offers Opportunities

There is a paradigm shift underway in renewable energy. After generations of renewables being more expensive than fossil fuel-based electricity, the cost of utility-scale solar and wind projects have now reached grid-parity, bringing the overall cost of renewable energy significantly below industrial rates for power.



Quayle Hodek

Chief Executive Officer,
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For the first time, there is an opportunity for forward-thinking companies to save money on their power costs by using renewables, or to even add a new revenue stream as a seller of clean energy. It's an extraordinary time to be working in the green power market.

Developing Solar Fields on Brownfield Sites Offers Major Economic Benefits

New England-area solar developer, Scituate, MA, became the first town in America that is 100 percent powered by renewable energy. In September 2013, Brightfields Development commissioned a 3.0 MW solar farm at the town's closed municipal landfill. “We didn't set out to be first, we set out to do what is right, and that to be environmentally clean and responsible while saving the taxpayers money,” said Al Bangert, Director of the Scituate Department of Public Works (DPW). “With this project, and the wind turbine (installed previously), all of our power will be produced without any carbon dioxide emissions,” he added.



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In 2011, the town took the initiative to transform its dormant landfill into an environmental and economic asset. The town selected Brightfields Development, an experienced solar energy developer specializing in brownfield projects, to be the project developer.

Prior to being capped in 2000, the 29-acre landfill accepted a combination of municipal solid waste, construction debris, and residuals for a nearby wastewater treatment facility. Through Brightfields Development's landfill engineering expertise, the capped landfill now hosts a 3.0 MW solar field composed of 10,560 panels. The project will generate about 3,750,000 kWh of clean energy annually, resulting in an annual savings for the Town of approximately \$200,000.

This project illustrates the value and importance of revitalizing brownfield sites, as well as the power of public/private partnership. The project was a collaborative effort among state agencies, town officials and other project stakeholders. Regular communication and transparency throughout the process facilitated a partnership that was able to effectively overcome development hurdles and successfully complete the project. Developing solar fields on landfills and other brownfield sites creates a valuable opportunity that creates significant environmental progress, energy security, and major economic benefits to communities.

Solar Installation Highlights Both Conservation & Alternative Energy

Cox Enterprises is a \$15 billion company with more than 50,000 employees. Our national sustainability program, Cox Conserves, seeks to create green operations and inspire others to embrace eco-friendly behavior. We had an opportunity to do both

at a solar installation at our Manheim New England location in Massachusetts. The photovoltaic solar project includes a 3 megawatt ground mount installation and 509 kilowatt roof installation.

Rather than one group, the ground mount portion was built into four groupings to preserve 28 acres of existing wetlands. The installation features an educational solar power trail to highlight the importance of conservation and alternative energy. The walking trail is available to employees and local school children. This is an example of thinking beyond the initial need and how a project can be used to serve as a visible, and inspirational, example to others.



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Solar Project Provides Six Percent of Annual Electricity to Owens Corning Plant

Owens Corning's Delmar, NY, solar project is now complete. Owens Corning joined efforts with Constellation and the New York State Energy Research and Development Authority to make this project happen.



Nancy Joy

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The solar field will supply about 6 percent of the Delmar Insulation plant's annual electricity. Constellation built the solar power system. It also will own and maintain it. Owens Corning buys the electricity generated by the system under a 20-year power purchase agreement with Constellation.

At Owens Corning, we believe we have a social and business responsibility to set the highest standard in energy efficiency. We believe we must deliver value today without compromising future resources. Our glass fiber insulation is made with more than 50 percent recycled content, and now the energy we use will come from a renewable source. The products we manufacture are a primary way to reduce energy consumption in residential and commercial buildings – saving consumers and businesses billions of dollars in heating and cooling costs. Not using energy in the first place is the best way to protect our natural resources.

We received much praise from leaders of the other groups involved in the solar project. The solar power system is composed of about 9,000 ground-mounted, photovoltaic panels located on more than nine acres. The system is expected to generate about 3.3 million kilowatt-hours of electricity per year. Generating the same amount of electricity using nonrenewable sources would result in the release of about 2,339 metric tons of carbon dioxide, according to EPA data for the region.

This is Owens Corning first ground-mount solar field and its largest solar installation. The Kearny, NJ, roofing plant has a 440 kW roof-mount system. Delmar's 2.7 megawatt-hours solar project can generate six times the capacity of Kearny's system.

Farmers Get from Sunflowers in the Field to Fuel in the Tank

Farmers across Vermont want to diversify operations, lower fuel and feed costs, and be more self-sufficient. Momentum is gaining as to how oilseed crops like sunflowers, canola, and soybeans can be raised for making biodiesel as a

fuel replacement and oilseed meal to feed livestock, and even be sold as crops. State Line Farm Biofuels is at the forefront of oilseed crop growing and biodiesel processing in the Northeast and is the first to grow and process on-farm in Vermont. Located in North Bennington, the Williamson family has owned and operated State Line Farm since 1936. The falling milk prices of the 1990s led to diversifying operations. In 2004 owner John Williamson and his family began experimenting with sunflower, canola, mustard, and flax varieties in an effort to fuel their farm with biodiesel.



Rachel Carter

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State Line Biofuels operates a 120,000 gallon/year (300 gallon per batch capacity) biodiesel production facility, providing biofuel and livestock meal for on-farm use. The production capacity of State Line Biofuels can additionally serve oilseed pressing and biodiesel production needs of 10-15 farms within a 30-mile radius, encompassing 1,500-2,000 acres of oilseed crops. State Line Biofuels is also an educational demonstration center for developing and teaching best practices for small-scale oilseed crop and biodiesel production across Vermont and the Northeast.

Biodiesel fuel can be used to power most any diesel engine equipment and on varying levels of scale. “We used to have a really small batch processor making about 100 liters to a batch. Then we moved to the biobarn and built a reactor that makes about 400 gallons to a batch—a batch of fuel is the amount of oil that is reacting to alcohol and lye,” John explains. The harvested seeds are dried and stored in a grain bin and then moved through an oilseed press to yield two products: meal and oil. Using the relatively simple batch reactor conversion process (oil, alcohol and lye), the oil from these crops becomes a low cost renewable fuel after being refined into biodiesel.

The meal could be considered the by-product, yet finds great value as a potential feed for livestock like dairy cows, goats, hogs, chickens, and sheep. At 40 plus acres of sunflowers, flax, mustard, and canola John averages 75 gallons of biodiesel per acre. Even factoring in wind, rain, and wildlife damage, John considers the State Line Biofuel operation a low cost fuel source, paying for both time and equipment.

“If you had to start from scratch, it is cost prohibitive. But if a farmer is already set up to grow grains, you’re most of the way there. If you can plant, harvest, and store grain, it’s really just the oil mill and biodiesel mixing equipment that’s needed,” says John. “There are many ways to look at costs, but the bottom line is it’s cheaper than buying fuel and money doesn’t leave the farm.

John has tracked the cost from tilling the ground to harvesting oilseeds and processing and at his calculations; the \$2-2.5 per gallon to make biodiesel is cheaper than buying petroleum. Operation costs are further reduced with the oilseed meal produced replacing the need to purchase grain. Additionally, John sells the surplus feed and oil, as well as the biodiesel.

State Line Farm participates in the Vermont Bioenergy Initiative which draws the connection between diversified agriculture, renewable energy, and food production in Vermont in the form of oil, grass, and algae biofuels.

SUSTAINABILITY PROGRAMS

Getting the grid ready for electric vehicles – An Ontario Made Solution

Two of the biggest challenges being faced by Ontario's energy industry today are satisfying peak demand and maintaining transmission equipment. These issues will only scale in difficulty as more and more electric vehicles (EV) appear on Ontario's roads and electricity providers work to meet demand. On the other hand, EVs offer an opportunity to smooth the load and to take advantage of off-peak surplus, low cost and low emitting electricity. How can we make sure our local distribution systems can make the most of this opportunity?



Josh Tzventarny

Director of Operations,
Plug'n Drive
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Currently, there are almost 2000 EVs in Ontario. Assuming adoption rates stay consistent, Ontario can expect more than 23,500 EVs by 2023. EVs can demand up to 80amps continuously during their charging session. When thousands of EVs plug-in at one time it can place significant strain on the power grid, complicating peak hours and/or overloading local transformers that weren't designed to handle such large draws at a single time. To help prepare the grid, the energy industry needs increased intelligence about penetration, driving habits, charging locations and charging patterns. Charge My Car @Home was developed for this very purpose.

Through a partnership between Plug'n Drive and Ontario's Local Distribution Companies (LDCs), Charge My Car @Home provides a one-stop-shop for charging station purchase and installation. With the permission of its customers, Charge My Car @Home shares each driver's charging location with their respective LDC. In so doing, the LDCs are empowered to install sub-meters at the home or via the neighborhood transformer to monitor the electricity load brought on by EVs. This information can then help the LDC better manage its systems in those areas while opening up the possibilities for vehicle to grid interactions. At the same time, the consumer gets expert EV customer service that the LDC would be hard pressed to provide. This project is an important first step towards unlocking the potential of storage in EV batteries in the future and will lay the ground work for a future "peaksaver" style program for EV charging.

How to Integrate Sea Level Rise Adaptation into Planning Mechanisms

In 2012, the Florida Department of Economic Opportunity (DEO) initiated a five-year project to integrate sea level rise adaptation into current planning mechanisms, including the local

comprehensive plan, hazard mitigation plan, and post-disaster redevelopment plan. One of the focus areas is to provide statewide guidance on how to implement an Adaptation Action Area (AAA) at the local level.

**Nancy Schneider**

Consultant,
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Beginning in 2013, through funding from the National Oceanographic and Atmospheric Administration (NOAA) and the Florida Department of Environmental Protection, DEO engaged the South Florida Regional Planning Council (SFRPC) to assist in the research for AAA implementation strategies. The SFRPC is working with the City of Fort Lauderdale, which is serving as one of the state's AAA pilot communities, and Broward County to test adaptation policy options to be incorporated into the City's Comprehensive Plan.

The final deliverable for this project is a report which should be read as resource for the state of Florida's coastal communities, providing guidance on the benefits of incorporating adaptation strategies into local planning policy and programs, a guidebook which will serve as a step-by-step toolkit. In addition to these two documents, six podcasts will be produced for a peer-to-peer information on the benefits of adaptation action areas in regard to city management, services, budgeting and emergency services; and a video with general information on AAAs for all stakeholders.

Though this project is based in Florida for Florida communities, we believe the lessons learned can be utilized in all coastal communities.

Lessons We've learned from the Boston Area Sustainability Group

In 2009, Rich Goode and Glenn Grant founded the Boston Area Sustainability Group, and I was among the first speakers. In the fall of 2012, Dr. Robert Pojasek and I took the reins, soon joined by Becky Snow. In 2013 we produced 11 events, and are now in our second full year as BASG 2.0.

**Carol Baroudi**

Organizer,
Boston Area Sustainability Group and
Global Sustainability & Compliance
for Arrow Electronics
www.linkedin.com/groups?home=&gid=4788147&trk=anet_ug_hm

The Initiative

The Initiative: To grow, educate, connect, inspire and support sustainability-minded folks in the greater Boston Area. To that end we bring together multiple speakers on wide-ranging sustainability topics to lead our monthly discussions. Our LinkedIn group grew from zero to more than 600 this year, and our monthly events draw a robust, diverse crowd, including environmental industry veterans with more than 40 years experience, current sustainability students, community leaders, educators, government workers – you name it. We come together to learn, connect, and help drive sustainability forward on all fronts.

What We've Learned

NOBODY KNOWS EVERYTHING. Regardless of one's area of expertise, sustainability is so wide, it's impossible to know everything. And it's important to keep on learning, because to really accomplish anything we agree with the adage, "First do no harm." Too many well-meaning ideas result in unintended consequences. Even on a given topic, we try to bring together several speakers to give ensure we get a broader perspective.

WE NEED EVERYONE. Sustainability can't be accomplished without a lot of help. As folks engage in sustainability they typically find that, as skilled and schooled as they are, sustainability asks them to answer questions they aren't prepared to address. Building a robust network of experts can help you when you go to tackle new challenges like, "What is your organization doing with its unwanted electronics?"

THERE ARE A LOT MORE PEOPLE INTERESTED THAN YOU EVER DREAMED OF. As we tackle new topics, we try to extend our invitations not just to those who already know about us, but also to new networks of folks who might be interested. When our topic was "Sustainability in Our Schools," we reached out to educators, parents, LEED architects, and the Green School Foundation. For "The Sustainable Food Fix," we sought out restaurant associations, grocers, and farmers. With each new topic our group becomes more diverse and stronger.

If you're visiting Boston, please come join us on the first Tuesday of the month. As we say at BASG, "Time is short and we need to learn a boatload fast"

Legacy of Good Plan Sets Path for Years to Come

In 2013, we launched our 2020 Legacy of Good Plan, which sets the trajectory for how social and environmental sustainability will become an accelerator for successful and sustainable customer and societal outcomes for years to come.



Erika Chan

Sustainability Strategist,
Dell
www.dell.com/2020

Our long-term sustainability plan is organized by our three areas of focus: we take action to benefit the environment, strengthen our communities, and engage our people in a diverse and inclusive workforce. Ultimately, the notion of adding value in these areas flows directly from our purpose to enable people everywhere to grow and thrive and reach their full potential.

Our plan includes 21 strategic goals bound by an end date of 2020. Our 10x20 Goal is our most ambitious — by 2020, the good that will come from our technology will be 10 times what it takes to create and use it. This goal aggregates the work of all the other goals and measures an outcome that stretches across many of our aspirations, helping demonstrate what is truly possible at the hands of our customers and partners — all of us working together.

The Environment

Dell's 2020 environmental aspirations focus on three areas: reducing the environmental impact of company operations, and enabling customers to do the same; driving social and environmental responsibility in the industry and supply chain, and promoting technology's role in addressing environmental challenges. The plan outlines 12 goals tied to its environmental agenda, each to be achieved by 2020, including:

- » **Reducing the energy intensity of our product portfolio by 80 percent, making Dell the first technology company to commit to make a portfolio-wide energy goal.**
- » **Reducing greenhouse gas emissions by 50 percent from our facilities and logistics operations.**
- » **Recover 2 billion pounds of electronics and reuse more than 50 million pounds of recycled-content plastics in our products. Integral to both goals is the ability to access e-waste in developing countries, using methods that do not put people or the environment at risk. This is why Dell recently helped launch the first large-scale e-waste recycling facility in East Africa and the creation of a new e-waste business to be supported by a regulatory model tailored for developing countries. The new model was developed by Kenyan officials and representatives from non-governmental organizations and the IT and e-recycling industries. Separately, Dell started a program to micro-finance women from Nairobi's Mukuru slums to safely collect and recycle e-waste in the new facility.**
- » **Ensuring waste-free packaging, with materials like wheat straw, mushrooms and bamboo, which are sustainably sourced and 100% recyclable or compostable: We've created a way to use a byproduct of wheat harvesting that's often considered waste. In fact, many rural farmers dispose of it through burning, which contributes to air pollution. By rethinking the common cardboard box, Dell is hoping to create a new market for wheat straw, turning what was once waste into sustainable packaging.**

People

We recognize that every 2020 goal depends on the engagement and support of a global workforce built on strong teams and enduring relationships. Our plan outlines ways the company will foster inspirational leadership, promote a supportive culture and give team members a voice in shaping the company's direction, including:

- » **Increasing eligible team member participation in flexible work programs to 50 percent.**
- » **Increasing university hiring to a rate of 25 percent of external hire.**

Communities

From consumers to multinational organizations, customers consistently indicate that Dell's CSR leadership contributes to their loyalty to the company. Reflecting the company's commitment to growing that loyalty in the coming years, the plan highlights ways Dell intends to make a positive impact on communities by applying technology, expertise, funding and volunteerism to solving real societal issues, including:

- » **Committing to engage 75 percent of team members in community-service initiatives.**
- » **Applying education technology and expertise to projects that reach 3 million young people.**

We are proud of the work we've done so far and recognize we have much more to do to live up to our long-term commitment. While we may not fully know every step of the path to achieving all the parts of our 2020 Plan, we are in clear agreement on the need to get started — realizing the potential for our positive impacts. We will work with our customers and stakeholders, reporting annually on our successes and challenges as we make our journey to 2020.

Eco-conscious Products Make It Easy for Customers to Do More

As a company, we are focused on helping our customers make more happen; that also means we have a responsibility to help them make more sustainable choices happen.



Mark Buckley

Vice President Environmental Affairs,
Staples Inc.

www.staples.com

While internally we're maximizing energy efficiency and renewable energy use, and reducing waste across all of our business areas and customer touch points, it's many of our external

commitments such as offering eco-conscious products and providing a range of recycling and green services that make a bigger impact. Our customers, as our partners in sustainability, help make this impact.

One of the most successful external programs we've been able to implement is our free in-store electronics recycling program. The rate at which technology evolves means that there's an increased demand for the safe and responsible recycling of old electronics by our customers, and as a retail that offers tech products, we saw an opportunity to help them. In the US alone, Staples has recycled 64 million pounds of e-waste through our free in-store recycling program since 2007. In Canada, we have recycled approximately 28 million pounds since 2010. Our ink recycling program has also made a significant impact. We're thrilled to have recycled 350 million ink and toner cartridges in the US since 2005, and over 15 million in Canada since 2008.

Like the need for an in-store recycling program, we're also always looking for new ways to offer customers more convenient environmental services. The launch of a new Staples technology trade-in program in the United States that lets customers cash-in and recycle online or in-store and the Canada School Recycling program, which offers Canadian schools a used ink collection service free of charge, are two examples of how we're helping make it easier for our customers to do more.

Shortest Way to a Guest's Heart Is through Food

Unless incredibly eco minded, the majority of guests don't want to hear about a hotel's greening efforts around reductions in water, waste, energy and chemicals. Happily, the same is not true when it comes to food—a good story around food that's local creates a unique and memorable dining experience.



Rauni Kew

Green Program Manager,
Inn by the Sea
www.innbythesea.com

Letting the guest in on a story about the fungi forager who brings locally foraged mushrooms or fiddleheads to your menu, or on the Nubian goats at a neighboring farm that produce the chevre for your velvety cheese cake, just makes food taste better.

Celebrating food that is local, and exposing a sense of your hotel's community, with support for local vendors and growers, is an important part of sustainability. The Locavore movement is wide-spread and popular. Guests tend to be vitally interested in the source of the food you serve. Giving credit to, and adding the names of the farms, foragers, fishermen and vendors to your restaurant menus, not only adds color and local interest while supporting your community, but assures guests that your food is fresh and nutritious.

Sharing what is unique about your community, and introducing visitors to local people, traditions and local food, makes it a richer guest experience, according to executive chef Mitchell Kaldrovich at Sea Glass restaurant at Inn by the Sea, on the coast of Maine. He invites local vendors and producers to talk about what they do. Weekly “Taste of Maine” presentations for hotel guests include overviews and tastings by microbrewers, growers or lobstermen. Guests have the opportunity to chat with distillers who make vodka from Maine potatoes, learn about the life of an artisan cheese maker, or hear what it takes to haul lobster on Casco Bay.

You won't find Chilean Sea Bass or cod on the menu when you visit ocean view Sea Glass. Alongside his essential lobster tasting menu, or signature Gulf of Maine Seafood Paella, Chef Kaldrovich's day boat catch and evening menus feature underutilized seafood, such as Whiting, fresh from Maine's coastal waters. The chef challenges guests to broaden their pallets with unexpected flavors, and enjoy lesser known but perfectly delicious local fish as a result of community collaboration around sustainable seafood.

"Sharing what is unique about your community, and introducing visitors to local people, traditions and local food, makes it a richer guest experience.

Bringing community members together to work in collaboration can benefit both the environment and the community economically. It can also create a compelling story around food for your guest. Kaldrovich is on the steering committee for a collaboration around sustainable seafood that began with research from Portland's Gulf of Maine Research Institute (GMRI), a handful of knowledgeable fishermen and 3 local chefs.

The collaboration met to identify underutilized but otherwise wonderfully delectable seafood species from Gulf of Maine. The goal is to preserve overly fished species, and to highlight and create markets and demand for less appreciated, underutilized seafood that is abundant. Fishermen currently can get as little as 5 cents a pound for perfectly good seafood that often goes to foreign markets or bait simply because there is no regional demand.

Starting with GMRI's research on local species, highly animated conversations between chefs and seasoned fishermen ensued. The group debated issues related to their own experiences around underutilized seafood with criteria around abundance, life span, diversity, habitat, seasonality, taste and texture, the kind of treatment needed on the fishing boats for restaurant quality seafood, and finally, the experience for both chefs and diners preparing and eating the

species respectively. They finally narrowed the field to five choices to promote. Portland is a foodie destination, and these well-known chefs and their trendy restaurants add the “sizzle” needed to bring broad attention to underutilized seafood. By creating mouth watering recipes for their menus, perceptions will be altered, and demand for underappreciated fish increased.

Reaching out to local agencies and collaborating with competitors can benefit the entire community and have a larger impact on environmental issues. And it has proved to be a delectably compelling “fish story” for guests at Inn by the Sea, adding greatly to a unique Maine culinary experience.

Education Program Provides Company with Best Practices, Lessons Learned

Of all the water on the planet, only 3 percent is fresh water. And less than 1 percent is readily available through rivers and streams to sustain more than 7 billion people on Earth. As members of the global community, both individuals and businesses have a responsibility to protect this resource.



Teri Kline

Environmental Manager,
General Motors

www.gm.com/environment

Between 2005 and 2010, GM reduced water use per-vehicle-produced by 32 percent and committed to another 15 percent cut by 2020. While this represents water conservation throughout the company’s operations, employee dedication to community outreach also makes an impact.

Through the Global Rivers Environmental Education Network (GREEN) program, now in its 25th year, GM encourages community engagement by helping youth better understand their impact on local watersheds. The program’s sustainability can be attributed to the value it brings employees, community groups, educators and students alike. It gives teachers an interactive way to increase student interest in the environment, helps youth see real-life implications of studies, enables local environmental groups to expand their influence, and provides GM employees a fulfilling voluntary mentoring experience.

It started when a University of Michigan professor and his graduate students collaborated to develop the GREEN educational model. GM became a financial and volunteer contributor a few years later. A collection of GM stakeholders including environmental staff, dealerships and facilities worked together to implement GREEN around the US, which included development of nationally recognized curricula, training, and educator resources. It has steadily grown ever since, especially after partnering with the nonprofit Earth Force who helped expand the program from 16 to all 42 of GM’s US sites. GREEN includes several activities throughout the academic calendar: investigating water quality; understanding causes of water quality issues; connecting to scientists; and implementing student-led projects addressing community needs.

The program gives teachers tools to build hands-on science lessons around watershed assessment and improvement. Resources include the "Protecting Our Watersheds" curriculum, testing kits, and links for community action projects. Educators then connect with local GM environmental engineers for assistance and leadership. Several water-monitoring events are organized each year in which students retrieve water samples, test and analyze them, identify an issue of concern, and develop a community project addressing it.

Last year, 231 GM mentors volunteered in water-monitoring events, classroom visits and student-driven watershed improvement projects. These employees represent every GM manufacturing site in the United States. The program engaged 8,996 students from 26 communities and 112 schools in 2013.

GM has learned many best practices throughout the last 25 years. First, the program requires collaboration. In addition to Earth Force, GM works with more than 20 community organizations to build environmental service-learning programs in GM communities. GM provides central coordination and resources to empower each local facility's staff members to develop relationships and grow the program within their city.

Second, this is not an initiative in which a financial contribution can be made and left for others to develop and implement. GREEN's success requires commitment, community engagement and ongoing effort from everyone involved.

Third, it must demonstrate business value to have staying power. GREEN continues to benefit GM's top line growth as well as the environment in communities we operate in. In fact, it has even resulted in hiring student participants that pursued STEM careers. Lisa Parks may not be a senior environmental engineer at GM's Tech Center in Warren, Mich., if not for her involvement in GREEN, which sparked her interest in science. The program has led to future recruitment and further brand awareness.

Sometimes it can even help sell cars. GM evaluates the program each year through surveys and one respondent said, "The entire reason I bought my new car from GM in 2009 was because of their commitment to helping school kids and the environment."

Other findings from the 2012 evaluation include:

- » **79% of students reported a better understanding of environmental issues**
- » **98% of educators would recommend the program to other educators**
- » **88% of GM employees said they agree this experience improves workplace satisfaction**
- » **98% of GM employees are interested in serving as mentors again**

Since 1989, 3,224 GM employees have worked side-by-side with teachers, community partners and 142,439 young people throughout the United States and Canada while supporting GREEN.

Communities Can Be Best Allies in Capturing, Repurposing Products

On Earth Day 2012, Bridgestone Americas launched its "spent tire program" on the National Mall in Washington, DC. The program, now known as "Tires4Ward," sets the vision for a waste-free tire industry and the goal of capturing and repurposing one spent tire for every Bridgestone tire sold. This is a significant goal and one that cannot be done alone.



John Sheerin

BSRO Environmental Director,
Bridgestone

www.oneteamoneplanet.com

Over the past two years, we have found that our best allies in capturing spent tires are the thousands of communities that we work in. We have partnered with community groups, large and small, across the country on over 200 river, lake, and other community cleanups. These events have cleaned up over 50,000 improperly disposed tires, which we have picked up free of charge. All of these tires have been sent to a valuable use.

A common piece of feedback from community organizers is to make the process easier for community groups to sign up for the Bridgestone tire pickup. So we are taking the feedback and will extend and improve our community cleanup application process at OneTeamOnePlanet.com. All community cleanup organizers have to do is provide 10 informational data points (name, address, etc), an event description, and an event date. We do the rest.

To Gain Internal Support for Environmental Initiatives, First Focus on Corporate Goals

In the fall of 2012, TD Bank sought to create an enduring environmental employee engagement (EEE) program that would become a part of the fabric of TD Bank. Our top priority was to capture the hearts and minds of employees with our green culture, making them allies in our work to be an environmental leader from the first day they join TD Bank and throughout their career with the organization.



Diana Glassman

Head, Environmental Affairs,
TD Bank

www.tdbank.com/aboutus/environment

We could not find a roadmap, so we set out to create our own program to engage our 26,000 employees in approximately 1,300 retail branches. The program is founded on our innovative 4Hs of Environmental Engagement methodology that defines four stages of engagement - awareness

(head), connection (heart), involvement (hands), and proudly sharing (horn) – each quantified with metrics linked to core business goals, such as revenue generation, employee satisfaction and cost reduction.

Critical to successfully integrating the program into TD Bank was identifying early on the need to infuse the environment into our culture and business goals. Key steps we took were to: build senior executive support, identify clear metrics aligned to business objectives, and determine key ways to tap into our corporate culture and customer service focus. By strategically embedding the environment across the foundation of TD Bank, we were able to launch a systematic program emphasizing peer-to-peer interaction and specific asks of employees.

We:

1. Shared our vision with senior leadership, seeking their input and building their excitement about the program to secure their buy in before launching.
2. Targeted 100% of employees, identifying four audiences (senior executives, “super greens,” retail employees, and all employees) and tailoring specialized messages and tactics for each.
3. Created “Green Leaders” throughout our footprint, enabling motivated employees to step up and stand out, and inspire their peers to get involved and spread the word.
4. Ran a pilot of the Green Leader program with a control group that demonstrated the positive quantitative business results, enabling us to create the business case our senior leaders needed to go full throttle with our rollout.
5. Infused the environment into HR processes – recruiting, orientation, training, leadership development and rewards and recognition – to reinforce environment employee engagement.

Our program has produced measurable success. We linked the impact of EEE to employee pride and commitment, both crucial to our service-driven industry and core business objectives – revenue generation, employee retention and satisfaction, and cost reduction.

Our results to date:

- » **Nearly 50% of our employees committed to “The Green Pledge,” seven simple actions that contribute to our environmental goals.**
- » **88% of all employees rank environment as an area where TD is making a positive impact.**
- » **We measured 11% office paper reduction.**
- » **We saw increased awareness of environmental initiatives and employee pride/commitment.**
- » **Employees are increasingly comfortable discussing environment with customers.**

These results, plus compelling anecdotal feedback, demonstrated to senior executives that EEE is helping the company reach its environmental and business goals.

Our program evolves to adjust for best practices and lessons learned. For instance, we learned to start small – by engaging our 26,000+ employees around manageable tasks, we celebrated small victories and fueled their passion for the environment. We learned to make it personal – the secret sauce to EEE is the human touch. We individually connected with employees until we reached a tipping point, where employees moved from addressing the environment as simply a workplace initiative to building it into their home lives. We learned to make our program replicable – our 4H framework was designed to help other organizations and communities engage employees and citizens around the environment. Finally, we learned to never underestimate the power of collaboration – banding together around the environment is critical to finding solutions for the future.

We realized that to gain internal support and traction for our environmental initiative, we had to begin with a focus on corporate goals and build understanding that our environmental goals and corporate goals in fact go hand in hand. This is at the heart of what makes our program sustainable.

Sustainable Supply Chain Initiative (Farming for the Future)

We are one of South Africa's leading retailers of quality food, clothing and general merchandise, with some 448 stores in South Africa, other African countries and the Middle East. As Woolworths has grown, we

have been integrating sustainability into the way we do business, whilst addressing key social and environmental issues facing the country and the world at large. In 2007, we formalized the company's commitment to sustainability with the launch of the Good Business Journey strategy. This is our sustainability plan to make a difference in the key sustainability areas such as sustainable farming and fishing, energy, water, waste, transformation and social development.

Addressing environmental constraints that have an impact on food security is a large part of our sustainable farming key area. As part of the Good Business Journey, we have worked with our suppliers to pioneer a holistic and scientific approach to growing food sustainably. The Farming for the Future program was adopted in 2009 to address the many agricultural challenges that face South Africa: water quality and scarcity, years of ecosystem degradation, poor quality soils in many areas, food security, climate change, rising input costs, and increasing rural poverty.



Makhegu Mabunda

Good Business Journeys Analyst,
Woolworths SA

www.woolworths.co.za

"We are committed to contributing to South Africa's socio-economic transformation by helping to develop small local enterprises.

Through our enterprise development program, we also realize that small-scale farmers have technical challenges that hinder them from entering commercial markets and therefore sustaining their initiatives. We therefore give assistance to a number of small scale farmers in order to get them into our supply chain by providing a loan to assist their fledging operation, as well as ongoing technical and business support.

We are committed to contributing to South Africa's socio-economic transformation by helping to develop small local enterprises. Our beneficiaries are part of the program and they became resilient businesses within a water-scarce country by scientifically measuring the water required for the plant and irrigating only if and when required, and farmers are seeing a significant water saving. They also adapt to climate change and become more resilient to extreme weather patterns.

We engage with these farmers and ensure that they meet the stringent audit requirements of our procurement codes. We do this by ensuring a win-win situation for both us and the farmers at a cost which is initially incurred by us. Also, throughout the process, the farmers are shown how to ensure their farms are resilient to climatic fluctuations and in so doing, assisting them to adapt to the impacts of climate change.

One of our successful Farming for the Future interventions is the De Fynne nursery. The farm started as a backyard nursery and grew to become a fully-fledged commercial horticulture supplier. It is currently part of both Farming for the Future and our enterprise development program. We supplied a loan to assist the fledging operation, as well as ongoing technical and business support. Today the nursery employs about 25 people and produces about 600 000 plants per year on just 1.5 hectares. DeFynne nursery has continued to grow and expand by moving to larger premises and branching out to grow research material and a range of fruit trees on a commercial basis for other companies. Woolworths has extended De Fynne's range to include various species of fynbos, Spekboom (supplied in a compostable, plantable pot), fruit trees such as figs and lemons, as well as blueberries and lavender. Our enterprise development program drives the message of food security, transforming supply chains and getting small-scale farmers into commercial markets whilst creating sustainable employment. It has helped farmers to grow and expand their business. It also gave many enterprises opportunities to improve their livelihood and create employment.

We have since intensified the enterprise development support over 50 businesses, which are receiving business development support and financial assistance. The benefit of these businesses

is that not only do they get business support: they also become part of our supply chain in order to ensure their sustainability.

Woolworths Transformation: Enterprise Development

Our Good Business Journey is our comprehensive sustainability strategy to make a difference in six key areas: energy, water, waste, sustainable farming, sustainable fishing, transformation, and social development.



Makhegu Mabunda

Good Business Journeys Analyst,
Woolworths SA
www.woolworths.co.za

At the beginning of our Good Business Journey commitments in 2007, we started engaging our business partners, including our main suppliers, to embark on this journey of transforming our operations with us. With that we used our Enterprise Development (ED) program as a tool to remove barriers to entry into our supply chain for small, medium, black and black women- owned enterprises. The Woolworths Enterprise Development program has been designed primarily to support emerging black-owned organizations within the greater Woolworths supply chain which includes primary and secondary suppliers. Through a balanced ED program based on an individual needs analysis approach, we are able to assist emerging black-owned suppliers to become truly sustainable businesses and part of our supply chain.

We have looked at the challenges faced by these small black-owned businesses and we are helping them grow by focusing on financial assistance (including shorter payment terms), guaranteed business, a package of support and mentorship, targeted up-skilling and access to experts. Our screening for business development through our enterprise development initiatives identifies gaps that will hinder business growth and funding and capacity gets availed to address these gaps. Over 5000 people are either employed or supported by the employees of these small enterprises. We continue to build on this pool of assistance in ensuring that our supply change is fully transformed and aligned to our values of transformation. We have, over the years, managed to ensure that we entrench our values into the way we do business, how we treat our employees and also ensure that our suppliers live up to the same value systems that govern how we do business.

We have intensified ED support to over 51 businesses in our supply chain that are receiving business development support and financial assistance. Woolworths has disbursed R27 million in loans and business opportunities worth R650 million were also accessed by these small enterprises. One of our successful interventions is Isikhwama Manufacturing which is a small enterprise which began with four people making 200 reusable bags a week and through the

support of our ED program, their business has grown to employ over 70 people producing about 30,000 reusable bags for Woolworths weekly.

This is a sustainable initiative because it helps to reduce the use of plastic bags and their detrimental impact on the environment, while also helping in creating employment for semi-skilled and unskilled people who were previously unemployed. The bags are made of fabric that uses 80% post-consumer waste (recycled bottles: recycled polyethylene terephthalate or rPET). Through this intervention and innovation, we were the first retailer in South Africa to use rPET in some of our merchandise.

Four Lessons Learned while Creating Closed-loop Products

Today, the system is broken: the use of resources worldwide is outstripping supply. At Kingfisher, we want to see a world in which creating and using products wastes nothing. Closed loop products are at the heart of the opportunity. Simply put, these are products that waste nothing when created and used. They are made from recycled or renewable materials and use only renewable energy in manufacture and use. If they break or are no longer needed, their materials and component parts can be harvested to make new products. We think that closed-loop innovation has the potential to be a game-changer that will define the future of our business, and those around us.



Richard Gillies

Group Sustainability Director
Kingfisher llc
www.kingfisher.com

We've begun this journey by setting out to have 1000 products on our shelves with closed loop credentials by 2020. One of the new closed loop products we have developed is called Infinite - the first-ever worktop for kitchens and bathrooms made from 100% waste sourced from both our stores and "end of life" DIY products.

The Challenge Driving the Product Development

Europe faces major waste and recycling issues: 35% of waste wood is still sent to landfill and only 25% of waste plastic is recycled. There's been some progress. For example, by-products from sawmills are already being recycled. However, a lot of post-consumer waste, such as pallets and packaging used in stores are harder to recycle.

The Innovation

We have brought together production, manufacturing, retail and logistics expertise from across our business – from Castorama France to Kingfisher HQ. In part, this has enabled us to draw on our engineering expertise from across the Group to take the design and manufacturing lead with our external partners. We worked together with the independent chemistry research centre, Certech in Belgium, and in collaboration with the waste recycler Veolia and composite wood manufacturers Océwood, to create a new engineering process called ReMade. Through applying ReMade, we developed an entirely new composite material from the waste wood from our stores and end of life plastics from DIY products. It's used in the hollow panel that makes up the core of the new Infinite worktop. We believe Infinite is a better product offer for our customers. It's 30% lighter than similar products on the market today and so is easier to handle and install, thereby reducing breakages. Where traditional particle boards are often damaged by steam and surface water, Infinite has a wood composite structure that is more water resistant. By replacing the use of virgin source material and harmful chemicals, our new engineering process ReMade also reduces the product's carbon footprint and preserves natural resources.

What We've Learned

We are learning all the time, discovering new ways of operating. Some work and some don't, but in success and failure, we've identified 20 key things we think might be useful for others. Here are four of our learnings that we have gathered in creating Infinity and other closed loop products across the business:

- 1. BE BOLD.** Focusing our energies on the most iconic products in our industry, like power tools, has attracted the most interest and attention. We've found it sparks people's imagination and brings fresh excitement and influence to the table.
- 2. DO REINVENT THE WHEEL.** Only by taking our products back to the drawing board have we been able to identify how to close some important loops, including selecting the right source materials and designing for repair and disassembly.
- 3. Waste is never waste.** It's a resource from which we can harvest materials and parts to reuse, renew or repurpose. It enables us to source from our customers the resources we would otherwise need from a mine or forest on the other side of the world.
- 4. COLLABORATE!** We look outside our own business to other businesses, suppliers, inventors, scientists and customers to identify the skills, techniques, systems and advice we need to go closed loop.

Eastman Hosts Energy Fairs to Commemorate Energy Awareness Month

Eastman is a global specialty chemical company that produces a broad range of products found in items people use every day. With a portfolio of specialty businesses, Eastman works with

customers to deliver innovative products and solutions while maintaining a commitment to safety and sustainability. Energy efficiency is a critical component of our focus on sustainability. Our Corporate Energy Team continuously seeks opportunities to promote energy efficiency, raising awareness both internally and externally.



Sharon Nolen

Manager, Corporate Energy Program,
Eastman Chemical Company
www.eastman.com

One of our key internal opportunities is the annual energy fair that has been established. The purpose of these fairs is to educate employees on how they can make more energy efficient choices at home and at work. External vendors and several pertinent internal organizations set up informational display booths, which employees can visit at their convenience throughout the day. Scheduled in conjunction with Energy Awareness Month, our third annual energy fair was held at Eastman's Tennessee Operations in October 2013. Vendor displays included home improvement stores featuring energy efficient appliances, local utility companies featuring incentives and tips for saving energy at home, and lighting demonstrations. Additionally, a local vendor that sells Eastman's Performance Films for home and car windows displayed a number of after-market, DIY film options. Eastman displays included Corporate Energy Management featuring information about energy efficiency at Eastman Corporate Sustainability featuring a number of consumer products made with Eastman's sustainably-advantaged materials, and a recycling display informing employees of the variety of items that can be recycled. In addition, ENERGY STAR brochures with energy savings ideas for both work and home were distributed.

In 2013, we expanded our energy fair concept to two additional sites: Longview, Texas and Ghent, Belgium. Similar in format, these fairs were enhanced with the local teams' ideas. Longview included posters sharing energy efficiency project successes. Ghent had an energy quiz for employees to identify energy savings opportunities.

Also new for 2013, Eastman's Energy Management team held an energy fair devoted to office energy efficiency at our corporate headquarters building. Employees participated in a number of energy efficiency demonstrations and had the opportunity to sign up for an office energy assessment aimed at reducing energy use while improving comfort. As a result of Eastman's efforts to focus on office energy efficiency, three office buildings received ENERGY STAR certification in 2013.

By focusing on efforts employees can make at home to save energy, the mindset carries over into the work environment. The fairs give employees the tools and understanding needed to make the right decisions concerning energy efficiency.

Volunteer Time-off Benefit Significantly Increases Volunteerism

Introduction of a volunteer time off benefit at IHS increased colleague participation by over 100 percent! As part of our global corporate sustainability efforts,

IHS is committed to corporate citizenship, colleague engagement and supports our colleagues in giving back to the communities where we live and work. Our volunteer efforts remain locally focused, within our global framework supporting the areas of health and wellness, education and environmental sustainability. Our colleagues were asking for more opportunities to contribute to their communities. As a result, IHS introduced a global paid volunteer time off benefit in 2013 for our more than 8,000 colleagues located in over 30 countries. The volunteer time off benefit resulted in a significant increase in colleague volunteerism, from more than 6,000 hours of volunteer time in 2012, to more than 15,000 hours in 2013. As formal volunteer efforts continue to evolve, we look forward to further engagement opportunities and positive contributions to our communities.



Marilyn Johnson

Director of Sustainability,
IHS

www.ihs.com/info/all/corporate-sustainability

The Goodwill Energy Challenge: Engaging Participation in a Member-Based Organization

As a partner of the EPA's ENERGY STAR program, Goodwill Industries International (GII) is dedicated to saving energy by promoting energy-efficient practices and products across its voluntary member organizations.



Lauren Senchack

Senior Consultant,
Hitachi

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Demonstrating its commitment to energy efficiency, GII utilizes EPA's measurement and tracking tool, Portfolio Manager to track energy performance and savings in its multiple facilities. This partnership also allows GII to utilize other ENERGY STAR tools and resources, which provide a framework for engaging numerous member organizations in improving energy efficiency.

In 2012, GII launched the Goodwill Energy Conservation Challenge as part of its Goodwill Sustainability Program, formerly called the Going Green Initiative. The Challenge involved friendly competition among Goodwill facilities and member organizations, and invited participants to take action in reducing energy use. GII's overall goal was to increase the number of facilities benchmarking their energy use. The goal of the competition was to see which member organization could improve its ENERGY STAR energy performance score (1-100 scale) the most.

Participants first tracked their energy consumption using Portfolio Manager in order to establish a baseline. Before launching the Challenge, Goodwill Sustainability Program team members engaged the Sustainability Program Steering Committee, comprised of CEOs from member Goodwill organizations, to ensure the competition had buy-in from leadership and member

"Currently, nearly 50 Goodwill organizations have signed up for the 2013 challenge, which will end in June, 2014.

organizations. This type of buy in is a key ingredient in the success of any energy efficiency competition. To show this support, a Steering Committee member and fellow CEO announced the launch of the Challenge at the annual conference for CEOs. Through the support of an external sustainability consulting firm, Eco-Coach Inc, the Goodwill Energy Conservation Challenge included three main phases and activities for the member facilities. First, participating facilities made a pledge to engage in the challenge; next, each store entered a year of energy data into Portfolio Manager and shared that data with GII; and third, facilities began taking steps to decrease

energy use, including tracking progress and entering data into Portfolio Manager on a quarterly basis. Finally, at the end of the competition, members were recognized for their participation and the winners were awarded prizes for their energy accomplishments.

The challenge ran from February 2012 through June 2013, and nearly 40 member organizations, constituting more than 500 locations, participated. Each entered two years of energy consumption data and was able to measure improvements over its baseline. Throughout the competition, GII sent participants energy-saving tips and quarterly progress reports. GII also provided access to other helpful tools, such as the Building Upgrade Manual, to help participating Goodwill facilities know where to focus their efforts to improve energy efficiency. Participants that achieved the greatest improvement in their buildings - 1 – 100 ENERGY STAR score compared to the baseline year - were recognized for their achievements.

In June 2013, GII honored the winners of the Energy Conservation Challenge at a Goodwill annual internal conference. Six Goodwill organizations in two different categories —“Freshman” for those using Portfolio Manager for the first time, and “Sophomore” for those that had previously

used Portfolio Manager—were recognized and received cash prizes from money donated by corporate sponsors. Nine other Goodwill organizations that showed an increased ENERGY STAR score over the course of the Challenge were also acknowledged during the award ceremony.

Through participation in the Energy Conservation Challenge, Goodwill met its initial objective to increase the number of its facilities and member organizations that are benchmarking energy use in Portfolio Manager. Goodwill members also earned ENERGY STAR certification for 18 buildings, and success stories were shared via Goodwill's internal website, highlighting the achievements of Goodwill members that had reduced their energy use and save money. Additionally, in recognition of Goodwill's energy management efforts, GII CEO Jim Gibbons was invited to be the keynote speaker at the 2012 ENERGY STAR Buildings Partner Meeting in Washington, DC.

Lessons Learned and Next Steps

After the competition, GII solicited feedback from participants to improve the challenge for the next year. GII learned that providing best practices, case studies, consistent communication, and status updates throughout the challenge, as well as responding promptly to participant questions and needs, are important to maintain momentum and excitement. Currently, nearly 50 Goodwill organizations have signed up for the 2013 challenge, which began in 2013 and will wrap up in June 2014. This is a significant increase from the prior year. In this competition, GII plans to provide support to challenge participants in the form of periodic updates on their standings; case studies showcasing member savings achieved during the previous competition; and webinars on using ENERGY STAR Portfolio Manager and on energy efficiency best practices internally and externally.

Lofty Goals Meet Reality

My company aims to shrink the carbon footprint of the built environment by making homes and businesses more energy efficient with thermal window inserts. Determined to incorporate that sustainability ethic into our storage and shipping practices, we designed a low-carbon, lightweight, reusable shipping container.



Sam Pardue

Chief Executive Officer
Indow Windows

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We launched the program, encouraging our Pacific Northwest dealers to save these reusable, collapsible corrugated cardboard crates and ship them back to us four or five at a time. We covered the cost of returning them and gave a financial incentive by reducing shipping costs on future orders. It seemed clear: we were about to develop a shipping program that would be a model of sustainability for others to emulate.

Then reality hit. For starters, we couldn't get the dealers to regularly return the crates. Even though the containers were designed to collapse to a smaller size, they were large and inconvenient to keep. And while the financial incentive was real, it didn't motivate them to fill up their valuable storage space with shipping crates.

As we added more dealers around the country, we did the numbers and realized something else: it made no environmental sense to ship crates 3,000 miles back to Oregon from the East Coast. A dealer has only a handful of crates at any one time. The carbon consumed to transport the weight of the crates to Oregon was more than the footprint to simply use a new crate. It made sense only if the travel distance was 500 miles or less.

We persevered. Rich Radford, director of operations, helped design an even lighter cardboard crate that could collapse to a third of its size. The smaller footprint made them even easier to recycle curbside. But that wasn't our goal. While recycling is good, reuse is better.

These new collapsible crates were a boon as we grew because they saved us valuable space in our small Portland warehouse where we manufacture our thermal window inserts. But we still couldn't get dealers to regularly ship them back for reuse. Even if we had, these ultra lightweight crates still didn't fix the math when it came to East Coast dealers shipping them back to Portland - either financially or in terms of carbon savings.

The ultimate solution we identified to reduce the carbon footprint of our shipping practices will be to open an East Coast production facility. This will make it easier to have a more sustainable shipping system but it will have other benefits as well. Since much of our acrylic is manufactured on the East Coast, we won't have to first ship it to Oregon to make the panels. East Coast orders can be manufactured there and shipped a short distance to customers. We are currently revamping our whole IT system to support distributed manufacturing.

Additionally, an East Coast production facility will help us launch a future project: reusing the thermal inserts themselves when someone moves and wants them cut to fit different windows. The closer we are to all our customers, the easier that is to do and the more sustainable we are overall.

When It Comes to Sustainability, Not Every Employee Is Equal

At Johnson & Johnson, corporate citizenship and means integrating sustainability across our company, and educating



Keith Sutter

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Johnson & Johnson

[www.jnj.com/caring/citizenship-sustainability/
strategic-framework/earthwards](http://www.jnj.com/caring/citizenship-sustainability/strategic-framework/earthwards)

and engaging every employee in a culture of corporate citizenship. We cultivate this culture and connect with employees in a variety of ways: sending newsletters with updates on social and environmental initiatives, hosting internal challenges to reduce our footprint, offering companywide sustainability trainings, and more.

But the truth is, when it comes to sustainability, not every employee is created equal. Though it is critical to inform and include everyone, we must recognize that some employees have the potential to generate a greater impact than others. Case in point is a challenge my team, the Product Stewardship group, faces every day: improving the sustainability of our company's products. Because we aren't directly responsible for designing products or determining the composition of Johnson & Johnson's product pipeline, we have to engage others to advance our cause. While it is important for everyone to understand the importance of product stewardship, what we really need are brand marketing and product development teams to actively pursue Earthwards recognition, an honor reserved for our most sustainable products.

In 2013, we sought to address this challenge by engaging senior leaders in one-on-one conversations about product stewardship and demonstrating the value of Earthwards to our product teams. We invested in proprietary research that highlighted our customers' demand for and interest in sustainable products, held a conference with senior leaders and healthcare professionals to discuss the need for sustainability, and led an internal communications campaign that showcased the business case for reducing our impacts.

We also worked to apply Johnson & Johnson's external influencer strategy to our internal audiences, and created a mapping process to better understand and prioritize stakeholders. Using a set of 80 employees from multiple departments, we ranked them against three categories:

- » **IMPACT: ability to influence widespread adoption of product stewardship across Johnson & Johnson;**
- » **AWARENESS: familiarity and understanding of the Earthwards approach and Johnson & Johnson's product stewardship goals;**
- » **SUPPORT: belief in the value of product stewardship and demonstrated prioritization of sustainability initiatives.**

Though we are still new to this process, the initial findings have been insightful. We discovered that some of our most impactful influencers don't necessarily live within marketing or product development, but instead are internal communicators who have the opportunity to educate others. We also learned that our strongest supporters are our "alumni," employees who have already been through the Earthwards process and have the credibility and expertise to influence their peers.

Moving forward, these audiences – especially alumni – will be a key focus for our team, and I encourage every sustainability team to reconsider your internal engagement strategy. Do you

know which employees can have the biggest impact on your goals? Are your communications reaching them? Do you have their support? Understand and invest in your influencers first; the rest of your company's employees will follow.

Partnership with University Offers Perspective on Strengths & Opportunities

As we began implementing our sustainability strategy, we looked for innovative ways to reach our key stakeholders. The Ohio State University Fisher College of Business provided that unique opportunity. We have partnered



Tanis Marquette

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with Dr. Neil Drobny's Sustainable Business Practices Spring 2014 undergraduate class and have dedicated the entire course to Momentive's Materiality Assessment. All of the students in Dr. Drobny's course are enrolled in Ohio State's fastest growing major, Environment, Economy, Development and Sustainability (EEDS), for which the course is a core requirement.

For Momentive, materiality is the relative significance of sustainability-related issues such that Momentive's position on an issue may influence the stakeholder's perception of the product, service, or organization. A materiality assessment provides numerous opportunities to drive sustainability-related value. But most important, it allows Momentive to align our sustainability strategy and facilitate focused discussions on how sustainability influences stakeholders' decisions and how we can partner with our stakeholders to improve environmental impacts. Further, it lays the foundation for ongoing stakeholder engagement activities.

Momentive, focused on specialty chemicals and materials, has stakeholders in more than 20 countries, across dozens of markets, with over 11000 customers and 10000 employees. Understanding sustainability issues across regions and stakeholder groups, and the opportunities and challenges within each one, is intrinsic to Momentive's business strategy. A total of 47 EEDS students are working in teams of three or four, with each team doing an in-depth assessment of an assigned market sector that is a key Momentive stakeholder.

Each team was also assigned one of four Fisher College of Business MBA students that have volunteered their time to support the students during the Momentive project. Through this partnership with OSU, the students are learning how to conduct a materiality assessment, investigate publicly available sustainability information on individual companies and market segments, and then map the "maturity" of the market they are investigating. The maturity map provides specific direction to Momentive on the strengths and opportunities known about a stakeholder company or market and identifies challenges Momentive may become a partner

in solving. The maturity map together with the materiality assessment becomes the foundation for stakeholder engagement communication plans. Skills in using materiality assessments and maturity maps, which are cutting-edge strategic tools, will equip students to enter the job market with an important competitive advantage.

In addition to the development of strategically focused communication plans for Momentive's key stakeholders, the students (in and of themselves a key stakeholder group) are providing Momentive with valuable insight as to how young consumers view Momentive, its products, and the opportunities within the markets that our products are sold. In Dr. Drobny's opinion, Momentive's partnership with Ohio State "exemplifies the type of collaboration that is very much needed to prepare students for seamless transition into the workforce."

DATA CENTERS

Arc Productions Reduces Server Power Costs by 56%

Data centers are designed to meet peak loads at all costs. When demand is low, however, most servers are left running, leading to huge amounts of wasted energy and large bills for those paying for that energy.



Aaron Rollow

Founder & Chief Executive Officer,
TSO Logic
www.tsologic.com

For 15 years, I built and managed large-scale transactional solutions for online retailers, with responsibility in data centers around the world. Every month, I paid the same hefty power bill, regardless of how busy my servers had been. As is the nature of retail, I knew that my servers were maxed out during the holiday season but quieter in other months.

When I began to question how efficiently my power dollars were being spent, I was frustrated with the lack of data, insights, and the controls to align server capacity with user traffic. I wanted the tools to power control my servers based on demand and I wanted the savings.

In 2010, I launched TSO Logic to provide an automated power control engine that would dynamically regulate server power based on incoming workload, without impacting end user performance. In addition, we collect detailed metrics on power usage that inform the business: how much do transactions really cost, how many transactions can be processed per kWh, and how was a data center's ability to deliver their applications or services changing over time?

One of our early adopters was Arc Productions, a visual effects and animation studio that produces feature films such as Gnomeo and Juliet and The Amazing Spider Man. Using our software, Arc Productions is power controlling servers based on demand and has reduced their server power costs by an impressive 56%. In addition they are:

- » **Scheduled to save \$600,000 and five million kWh's over the next five years**
- » **Tracking the amount of power going toward revenue-generating activities versus idle hardware**
- » **Able to see how much projects and tasks are costing them in energy**
- » **Able to perform precise capacity planning to improve performance and reduce costs**
- » **Shifting low-priority business applications to off-peak hours when power costs are less expensive**

Our work with Arc Productions was chosen for the Green IT Award for Product Deployment from the Uptime Institute in 2013 and our product has been chosen by The Environmental Leader as a Product of the Year in 2014.

Cost Savings Result from Avoiding Application Downtime

Problems with power cause over half of all application downtime today. Part of the reason power is now such a problem is the success most organizations have had in minimizing or eliminating single points of failure in the servers, storage and networking equipment. The

efforts to date to abstract, and therefore insulate, applications from problems in the data center's infrastructure have ignored power. Software Defined Power is an emerging solution to application level reliability issues caused by power and other problems.

The Software Defined Data Center (SDDC) provides these layers of abstraction for IT assets, but today's SDDC takes for granted the power needed by the virtualized servers, storage and networking equipment.

Software Defined Power, like the SDDC, is about creating a layer of abstraction that isolates the application from local dependencies and maximizes application uptime by leveraging existing failover and load-balancing capabilities to shift workloads across data centers in ways that always utilize the power with the highest availability, dependability and quality.

While the cost savings that result from avoiding application downtime are difficult to quantify, they are nonetheless real and substantial. The areas that afford the greatest savings are matching resources to application demand, power cost arbitration between sites, avoidance of peak rates and excess demand charges, and the ability to participate in lucrative utility demand response programs. A demonstration of our Software Defined Power shows application load resource matching and dynamic application load shifting between RagingWire's state-of-the-art datacenters in Sacramento, CA and Ashburn, VA, some 2,350 miles apart, with zero impact on users or application service levels. Once configured with the service level and other application requirements, Software Defined Power continuously and automatically optimizes resource levels, both within and between data centers. Companies can save money in their data center by using solutions that allow them to:



Emre Kulali

Director of Marketing,
Power Assure

www.powerassure.com

Monitor in Real-time

- » Integrate all facility and IT equipment and software in the data center
- » Gain real-time insight into power consumption and IT utilization metrics
Integrate IT and Facilities
- » Gain the ability to visualize IT and facilities by bringing them to a central management platform
- » Create dashboards, use trending tools and track KPIs to benchmark performance and to generate reports
- » Use application load forecasts, power pricing and energy markets intelligence in order to define operational procedures
- » Balance applications across data centers through automation and dynamic adjustments based on service level requirements and variable application load levels
- » Gain reliability and flexibility in load management by continuous dynamic application level load shifting across data centers
- » Free applications from physical power dependencies by shifting application load to the data center currently experiencing the best availability, dependability and quality of power
- » Cut on-going power consumption by 50% or more

As the complexity of enterprise data centers is increasing – enterprise IT environments usually involve multiple data centers, mixed tiers of service and public and private instances – Software Defined Power provides enterprises with unmatched reliability for their mission critical applications and the added benefit of substantial energy savings.

Cloud Computing: Measuring Carbon Footprint and Energy Efficiency from Utility to Bare metal

With increasing demand for computing resources, delivered traditionally or through the cloud services, organizations



Pankaj Fichadia

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are maintaining dual focus on energy efficiency for computing as well as implementing strategies to lower data center carbon footprint.

ODCA member companies Verne Global, BMW, and Datapipe (supported by NAB, Intel, T-Systems and Atos) recently released a proof of concept paper designed to test and validate the ODCA Carbon Footprint and Energy Efficiency Usage Model, and answer key questions about

the Carbon impact of High Performance Computing (HPC) and customer cloud instances at the 45-acre Verne Global data center campus in Keflavik, Iceland. The paper references concepts and metrics developed by The Green Grid. The POC results demonstrate that organizations from across the cloud ecosystem can leverage ODCA's Carbon Footprint and Energy Usage Model and requirements today to deploy greener and more energy efficient cloud services, and ultimately optimize enterprise cloud CO2 emissions.

"The good news is that aggressive computing demand and environmental sustainability are not mutually exclusive.

The test computed the aggregate carbon footprint of the Verne Global data center, and subsequently apportioned individual carbon emission values to BMW and Datapipe cloud instances. Actual values were recorded for the data center's renewable power source, and compared with hypothetical carbon emissions assuming a natural gas utility source and a coal utility source. Utilizing the Green Grid developed metrics, the POC analyzed technical measurements including PUE, IT Energy, Non IT Energy, Utility CEF, Transmission losses, Utility CUE, Customer Total Carbon and Customer Total CUE.

The scope of testing is limited to the data center itself. Obtaining precise figures on embedded carbon as a factor in equipment manufacture and disposal is discussed, but not specifically tested due to time constraints. What did we learn from the POC? The POC demonstrates a direct relationship between carbon emissions and power source, and highlights that business sustainability and cost effectiveness is driven by reduction of carbon emissions, and efficient use of energy. While improving PUE can help to improve the overall carbon footprint, the most direct carbon reductions can be achieved by choosing renewable power sources. When renewable power sources are chosen as the primary source, the focus changes from PUE to improving computational efficiencies to reduce the carbon impact associated with the computational equipment itself.

Enterprises can make equitable comparisons of carbon footprint of IT services through the techniques documented within the ODCA Carbon Footprint and Energy Efficiency Usage Model. When driven by a strong customer preference for purchasing low-carbon cloud services, cloud subscribers should quantify the carbon footprint of their cloud services with tangible, transparent and comparable data to support decision making and implement corporate social responsibility requirements.

Cloud subscribers should accumulate and aggregate the data for carbon footprint, particularly since capturing and reporting this data could become a necessary part of doing business in

the near future. As worldwide regulations increasingly move toward carbon-based regulation, enterprises can prepare by selecting cloud services that incorporate best practices for calculating and reporting on carbon footprint.

Data center and enterprise challenges to balance power intensive computing workloads, energy costs, computing efficiency, and environmental impacts are here to stay. How will your organization choose to focus on carbon footprint and energy efficiency to achieve the ultimate goal of sustainable IT transformation? The answer will depend on how well energy costs and environmental concerns are managed. The good news is that aggressive computing demand and environmental sustainability are not mutually exclusive. As demonstrated through this proof of concept, enterprises have available a number of avenues to reduce the carbon footprint associated with cloud services.

EMISSIONS REDUCTIONS

To Make a Difference in Climate Change Battle, Find Ways to Increase Energy Efficiency

Increased energy efficiency and the environment are constantly in the news. Is climate change for real? It was an odd winter around the world as far as weather has been concerned. Some parts of the world are in drought, while others are getting pounded by snow and cold or by massive flooding. Can we as the world's population do anything that may alter these effects of climate change? What would have to be done to see any positive results?



Sid Abma

Chief Executive Officer
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What Scientists are Saying

From what I read, scientists are saying this must be done:

- » **1. Reduce global warming**
- » **2. Reduce CO2 emissions**
- » **3. Conserve water**

How many chimneys are there across America poking out of the roofs of large government and commercial buildings and power plants? What is leaving out of most of these chimneys is hot exhaust and CO2 from the combustion of natural gas and coal, and maybe oil or propane. It is wasted energy. Why is this still being allowed? This combusted heat energy is supposed to be used inside the building or facility, not blown into the atmosphere. Did you know that there is water in all these combusted exhaust gases? This distilled water is also being blown into the atmosphere, when it could be utilized in the building, or even used to irrigate the lawns and flower beds.

It is time that America gets in control of its energy and stops wasting it. Want to make a difference against this climate change battle? Find ways to increase energy efficiency. The reduced utility bills will also benefit the efforts. "What is a weed? If a purpose can be found for the weed, it will no longer be considered to be a useless weed. It will then become a profit stream."

How Far Can Your Car Travel on One Tonne of Carbon Dioxide?

With new car CO₂ emissions remaining a key industry focus, we ask: how far can your car travel emitting only one tonne of carbon dioxide? We selected 10 vehicle models available for purchase in the UK with published

carbon dioxide (CO₂) emission figures, and hypothetically raced them from London towards Kuala Lumpur (we chose this route because an economy class flight from London to Kuala Lumpur emits approximately one tonne of CO₂). When each model of car had emitted one tonne of CO₂, it dropped out of the race.

None of our selected models of cars reached Kuala Lumpur on one tonne of CO₂. The most CO₂ efficient model we tested travelled 11,815km before reaching the one tonne of CO₂ limit in the jungles of Burma, 2,613km short of Kuala Lumpur. T

The winning vehicle travelled an astonishing 5 times further than the least CO₂ efficient model we tested. The distances hypothetically travelled by the selected cars are based on published emissions figures taken from the Vehicle Certification Authority (VCA 2012). In reality, the amount of CO₂ emitted per kilometer travelled depends on a number of factors, including driving style, the ups and downs of the route, road conditions, and how laden the car is. As such, this analysis provides an approximate estimate of how far these cars could travel on a one tonne of CO₂ allowance.

The route for the One-Tonne Race was identified using Google Maps route planner. The 14,378 kilometer journey, following major roads, starts in London, England (taking the Euro-star across the Channel) and continues through France, Belgium, Germany, Austria, Slovenia, Croatia, Serbia, Bulgaria, Turkey, Armenia, Azerbaijan, Iran, Afghanistan, Pakistan, India, Burma, and finally into Malaysia, and the final destination, Kuala Lumpur.

The ten selected cars (in alphabetical order) were: Aston Martin DBS V12 Carbon Edition Volante (gas), Audi RS Roadster 2 door (gas), BMW X6 M (gas), Ferrari 599 GTO (gas), Fiat Punto Evo GP 1.4 8v (gas), Ford Ka 1.3 Duratorq 75PS (diesel), Kia Rio 1 1.1 CRD (diesel), Porsche Boxster 2.9 liters (gas), Toyota Avensis TR 2.0 D-4D (diesel), Vauxhall Astra SRI 1.6l 16V Turbo 180PS 5dr hatch (diesel).

The ten cars set off from London, England, and all made it safely through France, Belgium, Germany, Austria, Slovenia, Croatia and Serbia. The first casualty, and overall loser in the One-Tonne Race, was the Ferrari 599 GTO (10th and last), which used up the last of its tonne of CO₂



Gary Davis

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allowance in Bulgaria, and was left stranded near the town of Dragoman, having only covered around 17% of the journey from London to Kuala Lumpur.

Next to drop out of the race was the Aston Martin Volante Carbon Edition (9th) which fared little better, travelling onwards to Sofia, the capital of Bulgaria, before its tonne of CO₂ was exhausted.

The BMW X6 (8th) made it to Istanbul in Turkey, the Porsche (7th) to the outskirts of Yerevan in Armenia, and the Audi Roadster (6th) ran out of its CO₂ allowance in the steppes of Azerbaijan.

The Vauxhall Astra (5th) and the Fiat Punto (4th) made it to Tehran in Iran, and Kabul, Afghanistan respectively. The Toyota Avensis (3rd) exhausted its CO₂ allowance on the outskirts of Lahore, Pakistan, leaving the Ford Ka and the Kia Rio battling to win the inaugural Ecometrica One-Tonne Race.

The Kia Rio made it successfully over the plains of northern India, across the Himalayan foothills, and onwards into the jungles of Burma. The Ford Ka (2nd), however, was stranded on the outskirts of New Delhi, India, finishing a very creditable second place. None of our selected cars made it all the way from London to Kuala Lumpur on one tonne of CO₂, but the Kia Rio (1st) was the overall winner, travelling 11,765km through 17 countries to Burma, before emitting the last of its CO₂, still 2,613km short of Kuala Lumpur.

The Kia Rio, in winning the race, travelled almost five times further on one tonne of CO₂ than the overall loser, the Ferrari 599 GTO.

Should Corporate Sustainability Targets and Metrics be Grounded in Science?

If a company claims that it plans to reduce its carbon footprint 15% by 2020, is that good? Better yet, is it enough?

These were the questions that we (Climate Counts) toiled with before our foray last year into a burgeoning concept called "sustainability context." As it relates to climate change, the idea is that with each passing year the scientific community becomes increasingly certain of how greenhouse gases (GHGs) are affecting our earth's climate and to what degree society needs to curb emissions over the next 100 years to avoid catastrophic climate change. With this knowledge, it should therefore be possible (in theory, anyway) to fairly carve up the global emissions pie in a way that each company knows exactly what their share of "carbon responsibility" is and what their emissions reduction targets should then be. For us, the concept made enough sense to



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embark on a mission to analyze GHG emissions (Scope 1 and 2) of 100 global companies against science-based targets that seek to limit climate change to 2 degrees Celsius (3.6 degrees Fahrenheit). Our partners on this project were Mark McElroy, executive director of the Center for Sustainable organizations and the father of the metric used in our study, and Bill Baue, a highly-regarded CSR journalist and corporate sustainability architect.

Surprisingly, nearly half of the 100 companies analyzed in our study (49%) rated sustainably, with Autodesk, Unilever and Eli Lilly earning three top spots in the ranking. On the flip side, 51% of companies appear to be emitting unsustainable levels of CO₂.

Obviously, with any project with this level of complexity, there are bound to be limitations and conflicting opinions about how we conducted our study (why no Scope 3? Why did we use contribution to GDP to allocate carbon at the company level?). To the extent possible, we made a point to lay out all of our reasoning and assumptions in the FAQ of our report.

At its very basis, climate change poses a threat to our existence and needs to be addressed. Also, while it remains a topic mired in partisan politics, climate change is ultimately a matter of physics (the greater the concentration of atmospheric carbon, the less stable our climate systems become). With this in mind, it seems only fitting that, as sustainability professionals, we should be seeking the most accurate and progressive methods available to measure and manage our collective carbon impact. With the high stakes at play, climate change deserves to be confronted with a response that is based in science.

Carbon Footprint Certification: Why Does It Matter?

Seed Hawk recently became the first agricultural company in the world to receive Carbon Footprint Certification. Why is Carbon Footprint Certification important? Why should I care about it? How does it impact me?



Meaghan Merrick

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These are valid questions, and they have reasonable answers. As the founder of a company that builds a product that is used for no-till farming, it was important for me to get the message out to the public that our product is good for the environment and the process of Carbon Certification was the best way to do that. When a farmer no-tills his/her land, he leaves plant residue, made up of stalks, leaves, and roots on the land, and by doing this, he builds up organic matter in the soil. The plants that make up that residue take carbon dioxide or greenhouse gas from the air, and store it in the soil as biomass. Some of that carbon dioxide is taken away as a crop, but the rest remains in the soil, breaking down very slowly, and further enriching it for future crops and future generations.

This biomass is extremely important in producing quality, nourishing crops. A tillage operation breaks down the organic matter and that carbon dioxide is released back into the atmosphere. No-till as a method of farming is desirable because by cleaning the air and enriching the soil, it is a win/win for the environment.

This is a big deal and a good news story for agriculture, but it doesn't get a lot of media attention. At a time when the agriculture industry is under careful scrutiny by larger society, the Carbon Certification Program is a way for us to show the public, both by showing the energy required to build our product, and then what is saved by using our product, that some companies are keeping the environment a priority in their business practices. It will also draw attention to the practice of no-till farming and how it is helping the environment. As an example, a farmer that seeds 5000 acres using a no-till system like that of Seed Hawk will store about 800 tonnes of carbon dioxide equivalent in the soil every year, which is significant. The first step of the Carbon Certification process involved us approaching an organization called the Saskatchewan Research Council, who helped us to calculate the footprint of building our product. They put us in touch with Carbon Trust, which is an organization in the UK with a well-respected label around the world. Carbon Trust analyzed our numbers and qualified us for certification on our 45 and XL series toolbars, and our 30 series models.

The next step will be to help the farmer to calculate the amount of carbon he or she sequesters in their soil. The calculations exist and are fairly well known and can be used toward Carbon Credits. Seed Hawk will work toward an additional label to show carbon sequestering for the farmer. This label, coupled with the Carbon Footprint for production of the product, will add up to a significant environmental benefit that will be visible to the public.

The world is becoming more and more carbon-conscious. Consumers are looking at what goes into producing a product before it gets to their table. As demand for this kind of information grows, farmers are going to be asked to provide it. I think we will start to see Carbon Footprint information on a bottle of Canola oil, on a bag of flour. As a seeder manufacturer, we are seeking to be ahead of the curve and provide that information for farmers, so they can provide it to the end consumer. Taking the time to get this done early will do a lot to show how our customers are doing their part for the environment through the decisions they make for their operations.

Lesson Learned Around Big Data

Measuring Global CO₂ emissions is a challenge. In 2013, I monitored Key Performance Indicators relating to resource use in conserving energy, water and decreasing carbon and waste for more



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www3.prudential.com/prei/main/sustainability_initiatives.shtml

than 500 properties in United States, Europe, Asia, and Latin America for a Global Real Estate Investment Management Firm. Approximately 30,000 energy meters were measured and the carbon emissions recorded in a global platform ULI's Greenprint Center for Building Performance. All of this information was reported to Global Real Estate Investors through GRESB (Global Real Estate Sustainability Benchmark).

The lesson learned about Big Data is that data quality will improve over multiple years. The tactic is to have as many participants as possible involved in data collection. When the buildings know energy and water consumption data are collected, they understand that measuring carbon emissions is a routine part of the job and each person that touches the process should do their part as a contributor to measurement of sustainability.

Good Results May Not Be in Line with Your Envisioned Goal

2013 brought an interesting side benefit to the use of algae as a method of mitigating greenhouse gas emissions. While our demonstration facility in Baltimore is mitigating 85%



Bob Mroz

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of CO₂ and 100% of NO_x from a methane-fired 3MW Power Plant, we discovered our algae could also mitigate Volatile Organic Compounds (VOCs).

As a result, we are in the process of setting up a demonstration of this capability of our technology. Installing our bioreactors in the mechanical room of a commercial building just before the point where the CO₂ and VOC laden indoor air of the building is vented into the local environment can not only eliminate the need to vent the poor indoor air to the outside, but the oxygen generated by the algae from photosynthesis can be returned to the building, saving some of the costs of heating or cooling incoming air.

A further benefit of adding our mitigation technology to the air handling systems of commercial buildings would be the increase in the oxygen level in the building from returning the photosynthesis generated oxygen back into the building which would heighten concentration, alertness and memory of the occupants of the building while improving their general health. This discovery now adds a new product/service to our offerings. Currently, our bioreactors and associated technology will mitigate greenhouse gas emissions from any source of fuel including coal, oil, natural gas, methane, digester gas, biomass and pretty much anything that will burn. Our targeted audience was power plants, landfills, waste water treatment plants, cement plants, ethanol plants and any

other facility that generates exhaust gases containing CO₂, NO_x and SO_x. We can now add to that list commercial buildings that vent CO₂ and VOCs.

The lesson to be learned here is to be open to results that may not be in the direct line of your envisioned goal. We were concentrating on improving the greenhouse gas emissions mitigation performance of our bioreactors and associated technology and would have missed an extremely valuable capability of our technology.

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