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Riding the Green Wave

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Introduction

The "Green Wave" refers to one of the three elements of Corporate Sustainability. Corporate Sustainability is a business management strategy in which organizations measure their business success on economic, environmental, and social performance indicators. Today this triple bottom line has been embraced by many world-class companies. The European Union has adopted the concept of Sustainability and created directives to mandate corporate responsibility for products produced. Australia also focuses on corporate "Sustainability". US based and international organizations are finding that the path to world class status involves Sustainability.

Environmental, Health and Safety (EHS) professionals need to understand the principles that our corporate leaders expect. In some organizations, the leadership of Sustainability efforts has been placed with EHS management. This is because efforts to eliminate hazardous constituents in products, reducing waste, recycling of manufactured products and doing the right thing in regards to people inside and outside the corporation, also will reduce exposures and injuries to employees and the community. This paper will explore the environmental element of Sustainability, namely, what can be done to reduce the carbon footprint in any organization, how to reduce energy costs, how to reduce waste and how to keep hazardous chemicals from further impacting the earth. Practical examples will be used to help the EHS professional to apply these concepts in their own workplace and hopefully lead the eco-efficiency efforts.

Leading the wave

The environmental aspects of Sustainability make sense for most EHS professionals, even those of us with a more safety related background can usually relate to ecological risks and benefits. For example, the US Environmental Protection Agency (USEPA) has been promoting the benefits of Environmental Management Systems (EMS) for some time. Even though EMS is not a regulatory requirement per se in the US, many companies are already International Standards Organization (ISO) 14,001 certified. This is a proactive method of reducing or preventing eco-

risks. The European Union has taken this a step further. In December of 2006, the EU passed the REACH directive (regulation). It went into effect on June 1, 2007. REACH stands for: Registration, Evaluation and Authorization of Chemicals. The stated aim is to "improve the protection of human health and the environment through the better and earlier identification of the properties of chemical substances" (REACH 1). The concept is to give greater responsibility to industry to identify and manage risks from chemicals and provide safety information. It is initially a registry of information but it is expected to lead to the banning of certain hazardous chemicals in the future.

Two other recent EU directives do restrict or ban the use of hazardous materials in electronics. One, RoHS stands for Restriction of Hazardous Substances and applies to electrical and electronic equipment in the EU market after July 1, 2006. It restricts the level of six substances in such equipment. Those substances are: lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame-retardants. WEEE is the other EU directive. It stands for Waste from Electrical and Electronic Equipment and mandates the treatment, recovery and recycling of electric and electronic equipment after August 13, 2006. (RoHS and WEEE 1)

The EU also enacted the End-of-Life Vehicle (ELV) Directive in October 2000. The legislation, implemented in stages throughout the last five years, aims to regulate auto recycling among the EU's now 25 member states and ensure collection and recycling of more material from Europe's ELVs. Automakers are expected to change the way they design and produce vehicles so that they may be recycled more easily.

So what do these recent EU directives have to do with corporate sustainability? Companies that manufacture or sell products in the EU must comply with these new directives. Even those companies with a core value of Sustainability will likely need technical expertise to comply with these directives. Some US based companies are just starting to understand that regulations in other parts of the world will have a huge impact on future profitability. This presents an opportunity for EHS professionals to consult with senior operations management to comply with the new regulations and expand existing management systems to include future concepts.

To illustrate how this process could occur a client case example will be used. ABC multi-national corporation ("ABC") has a variety of product divisions and hundreds of sites worldwide. One of the major divisions makes large diagnostic equipment. The corporation's website shows a focus on sustainability and their sustainability policy includes economic, ecological and social responsibility objectives. The Corporate EHS Director at ABC (based in the US) was aware of the upcoming EU directives and kept senior management informed of future impact. About six months prior to the directives implementation date the Director of R & D approached the EHS Director about the need for more information on the impact of the directives on equipment development. The EHS Director worked with outside experts to develop an educational session for both R & D and Marketing personnel.

This was the beginning of a major redesign effort that allowed the EHS Director to lead a senior project team and significantly increased the individual's visibility within the organization and moved the company toward modularizing the electronic equipment for worldwide sales. It also illustrated the need for the company to tell its customers about previous work that eliminated hazardous continuants in the equipment and set it apart from its competitors. This example shows

how EHS professionals can have a significant impact on the company economic bottom line by awareness of future global regulation and best practices in environmental sustainability. It also shows how companies who reduce toxic chemicals can ultimately create a market for more sustainable products.

Reducing the Carbon

Major business impact can be made by reducing the carbon dioxide and other emissions from fossil fuel. According to US EPA, industrial and commercial energy use accounts for nearly 30% of total U.S. greenhouse gas emissions. These emissions primarily result from electricity use, product transportation, burning fossil fuels to power boilers and produce steam, and using gasoline to power vehicle fleets. Some industrial processes also produce greenhouse gases. (EPA – What Can You Do 1)

Specific actions that businesses can take to reduce greenhouse gas emissions while also saving money are set out below.

1. *Manage and Reduce Greenhouse Gas Emissions*

Any business can prepare an annual greenhouse gas inventory and set long-term targets to reduce emissions. EPA's Climate Leaders program provides technical assistance and recognition to U.S. companies that have joined this program. Climate Leaders Partners develop their Greenhouse Gas (GHG) emissions inventory using the Climate Leaders GHG Inventory Guidance. Companies are required to document emissions of the six major GHGs (CO2, CH4, N2O, HFCs, PFCs, and SF6) on a company-wide basis (including at least all domestic facilities) associated with:

- Onsite fuel consumption and energy use
- Industrial process-related emissions (as applicable)
- Onsite waste disposal
- Onsite air conditioning/refrigeration use
- Indirect emissions from electricity/steam purchases
- Mobile sources

2. Educate

EHS professionals can educate themselves and their leadership, their customers and their suppliers on the possible effects of future climate change. Information sharing will expand the base of ideas, opportunities and solutions.

3. Improve Energy Efficiency

Improving energy efficiency not only reduces greenhouse gas emissions into the atmosphere, it is good for a corporation’s economic bottom line, as many U.S. businesses face rising energy costs. Developing and implementing an effective corporate energy management program allows companies to manage energy with the same expertise used to manage other aspects of their business. EPA provides tools and resources to help organizations improve their energy

performance as part of the ENERGY STAR Program. It also has a tool called Portfolio Manager to help companies establish the current energy use of their buildings, and determine reasonable energy savings goals. ENERGY STAR also has resources for Small Businesses.

4. Buy Renewable Energy

Purchasing or investing in clean energy technologies (wind, solar, biomass, small hydro and co-generation) can reduce greenhouse gas emissions and improve energy efficiency. Some companies have installed solar panels on their roofs and constructed wind farms to meet their electricity needs. As these alternative energy sources become more popular, more companies will be able to save money with eco-efficiency.

5. Lead By Example

Leading businesses and corporations are evaluated on many aspects of their performance, including product quality, ethics or standing in the community. These leaders can provide a powerful example promoting greenhouse gas reduction strategies through corporate incentives such as financial assistance for employees who use public transportation, car-pooling and even telecommuting. Other "green" practices such as recycling and purchasing recycled materials also contribute to emissions reductions. Corporate policies involving employees and day-to-day operations can have a positive impact on the climate in and outside the office (EPA Climate Leaders Program 1).

Some additional ideas can significantly reduce the organization's carbon footprint. These tips are adapted from the Climate Change Guide by Canadian Business for Social Responsibility (Climate Change Guide 42-43).

<u>Lighting</u>
Lighting consumes 40% of electricity in commercial buildings and is accountable for another 10% of the cost of cooling the heat it produces.

Maximize daylight: Install skylights and larger windows. High-efficiency windows are the most common day-lighting tool producing excellent transmission of visible light and low thermal conduction.

Increase bulb efficiency: Use lower wattage and more efficient fluorescent bulbs. Compact fluorescent bulbs may cost more up-front, but they last longer, require less labor than incandescent bulbs and, use less energy. **L**ight **E**mitting **D**iodes (LEDs) are even more efficient than CFLs and are becoming more available.

Install dimmer switches: Using task lamps and dimmer switches will personalize employee workspaces and improve comfort levels.

Install light shelves: These shelves have a reflective surface inside or outside of a building located at the base of windows. Their function is to reflect light deeper into the building and into places where natural light is needed most – on ground floors and in internal cavities.

Use low-wattage 'Exit Signs': These reduce energy usage 24 hours a day. LEDs are readily available for this application and can save significant amounts of energy.

Use occupancy sensors: These sensors automatically turn off lights in unoccupied rooms.

Utilize automatic devices: Technologies such as power monitors and smart meters will reduce energy consumption.

Heating and Cooling

Space heating and cooling accounts for nearly 30% of primary energy usage in commercial buildings.

Increase insulation: Using higher "R-value" insulating materials will reduce the rate of heat transfer to and from the outside environment.

Replace windows: Use windows that employ non-conductive argon gas between the panes and low-emissivity coatings. Low cost alternatives are window films and shades that help to limit heat transfer.

Coat roofs: Use white or reflective roofing materials or coatings to reflect heat and cool buildings by reducing ambient temperatures and lowering the 'heat island' effect.

Adjust heat settings: During winter, heat your building to a maximum of 70° F when occupied, 61° F when unoccupied.

Reduce temperatures: In unused spaces reduce or simply turn off heating.

Install building automation systems: These systems can save 5-30% in energy costs, and have a payback of two to four years depending on the hours of operation used, type of system, and equipment controlled.

Computers and Appliances

Exercise power management: Encourage employees to use their PCs power management features or have the information technology (IT) department do it.

Turn off monitors: Encourage employees to turn off their PC monitors when away from their computers. Activate screen savers for each PC to secure further reductions.

Specify 80 PLUS power supply when ordering computers: 80 PLUS certification ensures that a computer's power supply is at least 80 per cent efficient and will save 88 kWh/year/computer.

Turn off photocopiers: Operating photocopy equipment efficiently by turning it off after hours will reduce energy use by 25% or more.

Consider laptops: Laptops provide mobility for staff and use 50% less energy than the average desktop unit.

Transportation

Explore alternatives to plane trips: Air travel is the most carbon intensive travel method; consider teleconferencing and videoconferencing as alternatives to in-person meetings.

Consider teleworking: Using communications technology to work at a distance rather than commuting is an alternative to traditional commuting for some employees.

Encourage car-pooling: Create incentives for employees to use car pools or other alternative methods for their work commute, such as walking, cycling, and mass transit.

Case Example

Sustainable Forest Management

For ninety-six years L.L.Bean has sold products that enhance their customers' relationships with the outdoors. They continually seek to minimize the adverse impacts that producing, marketing and distributing these products have on the environment.

As a direct marketing company whose use of paper is critical to the business, L.L. Bean has committed to source all paper from responsibly managed forests. With the new paper contract in 2008, all catalog paper increased to 20% recycled paper, includes an increasing amount of third party certified fiber, and is chain of custody certified.

Climate Change

L.L.Bean wanted to ensure that the operations and the products they make do not negatively impact the global climate. L.L.Bean is a member of the Environmental Protection Agency's (EPA) Climate Leaders program. They completed an extensive inventory of their greenhouse gas (GHG) emissions from all US-based facilities and fleet. A comprehensive inventory management plan and a GHG reduction goal will be set by the end of 2008. Partnering with groups like Clean Air-Cool Planet provides expertise and resources related to this issue.

Green Building

L.L.Bean has committed to LEED certification for all new construction. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ is the nationally accepted benchmark for the design, construction and operation of high-performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. All new buildings are built using LEED principles. Six L.L.Bean stores, as well as a Data Center have been built in the US based on this model. Here are just some of the many elements incorporated into the resources, construction and environment of this building to meet the high-efficiency goals:

- Lighting is wired into a time clock that turns lights on and off in response to the daily sun path, taking advantage of large expanses of daylight, reducing electricity consumption.
- To optimize savings and performance, energy sensors are used in spaces that aren't occupied on a regular basis.

- The majority of equipment and appliances have an energy-efficient Energy Star rating.
- Air quality in the store was monitored during construction and will continue to be tested regularly to ensure a healthy indoor environment.
- The plumbing fixtures (including those used in the waterless urinals, ultra low-flow toilets and low-flow employee showers and sinks) significantly reduce the expenditure of potable water.
- Natural materials have been used wherever possible. The Douglas fir panels on the sales floor walls are remilled wooden school bleacher seats. Materials made from rapidly renewable resources – such as bamboo flooring and bamboo plywood were used for the bicycle shop counters.
- Any wood not recycled or remilled is Forest Stewardship Council certified as coming from sustainable forests.
- 76% - 92% of construction material is recycled and landfills avoided.

Energy Conservation and Renewable Energy Generation

L.L.Bean has an ongoing successful program of energy efficiency that includes the use of energy sensors in offices and buildings throughout the company and the use of energy management systems that measure and control temperature and humidity. Most equipment and appliances are Energy Star rated. Most lighting fixtures and bulbs have been replaced with energy efficient alternatives. Most corporate buildings utilize motion sensor light switches as another way to save energy. As restrooms are remodeled, plumbing fixtures are modified to include using waterless urinals, ultra low-flow toilets and low-flow sinks and employee showers. Since 1982, L.L.Bean has been using solar power to heat all the water for the corporate offices in Freeport, Maine. The hot water is used in all corporate restrooms and employee showers. They are also exploring installing renewable energy generation such as wind power or photovoltaic systems at other L.L.Bean facilities.

L.L.Bean has always approached energy conservation as good business. They already incorporate 30 percent renewable energy in electricity purchases via a Maine energy mandate.

Restricted Chemicals Policy

In 2002, L.L.Bean began work with Businesses for Social Responsibility and other large retailers in a voluntary effort to ban substances from manufacturing that could pose health and environmental risks. The Restricted Substance List (RSL) provided to suppliers requires them to find substitutes for potentially harmful chemicals such as PVC (polyvinyl chloride). L.L.Bean has phased out PVC from all its branded merchandise. L.L.Bean is currently a member of the American Apparel and Footwear Association's Environmental Task Force, a cross-brand group working towards sharing best practices with regard to restricted chemicals.

Alternative Fuel Use

In 2003, L.L.Bean converted its heavy truck fleet to biodiesel fuel and bi-fuel propane/gasoline in company pickup trucks. Biodiesel is also used in the fleet of buses that support the Outdoor Discovery Schools. They are working with suppliers to develop strategies to limit emissions and the environmental impact associated with the freight and cargo business. Outside L.L.Bean, they financially support a fleet of propane buses used in Acadia National Park that reduces harmful emissions and provides transportation for three million visitors annually.

Corporate Recycling Program

In the late 1980s, L.L.Bean established an aggressive corporate recycling program. In our Order Fulfillment Center, over 5,000 tons of cardboard is recycled annually. This summer, L.L.Bean will adopt a process that will take plastic scrap and turn it into pellets that their vendor will recycle into new L.L.Bean plastic shipping bags.

They also recycle building materials such as glass, metal and wood. Every employee is expected to separate trash for recycling purposes; newspaper, office paper, computer paper, old catalogs, magazines, cardboard, plastic, cans and bottles. As of 2006, they have reduced the corporate waste stream by 82 percent. Most company office supplies and equipment that are no longer needed are donated to a local nonprofit - which redistributes supplies to Maine public schools.

Conclusion

These eco-efficiency efforts are just a few of the concepts that the EHS professional can apply in their own workplace. Reducing greenhouse gases and waste have a positive impact on the bottom line of any company, and often it helps competitively. “Smart companies get ahead of the Green Wave and lower both financial and operational risk.” (Esty and Winston 13)

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