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Innovating Green: How to Beat the Competition in an Uncertain World

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Successful industry leaders understand that even in the current economic turmoil, innovation is crucial to remaining competitive and to growing business. Savvy innovators are entering a new design space and are finding that it has the potential to radically alter our world for the better and give their companies the edge they need to be on the top. That space is green.

Business innovates by developing new and disruptive technologies, refining existing technologies, or developing new applications for existing technologies. The innovator or innovation team divides the task into three segments: defining the problem, creatively brainstorming solutions, and putting it all together. The fundamental goal is a product or process that is better, cheaper, faster, or all three.

What Is Green Innovation?

Green innovation results in a product or process that has environmentally neutral attributes or reduced resource needs. Green innovation expands the innovation box to include the environmental footprint of the product or process. It also fulfills the fundamental goal of better, cheaper, faster.

Environmentally neutral products and processes are those in which material, water and energy use are eliminated, minimized, or substituted with other sources that have less environmental impact. The environmental footprint considers the sustainability of the raw materials employed, how the product or process is packaged, transported, used and disposed.

It may not be intuitive that a company can achieve a significant competitive edge by considering the environment. The perception is that consumers and businesses are reluctant to purchase green products or services. Reasons given include prohibitive cost, maintenance concerns, and general aesthetics. Companies that have already moved along the path of green innovation are turning these reasons into myths by developing products and processes that incorporate these features, translating into reduced cost and a better price point:

- Reduced energy use,
- Easy to recycle or made from recycled material to begin with,
- Use less material,
- Take up less space,
- Use less packaging materials or require less maintenance.

Three Potentially Disruptive New Green Technologies

Hycrete (<http://www.hycrete.com/>) is a new product that is positioned to disrupt the concrete industry. This material is an admix that seals the capillaries in concrete, making it waterproof. It extends concrete's useful life and also facilitates recycling. The current industry standard uses external plastic vapor barriers and coatings, which offer similar

costs, but without the recyclability. Hycrete has the potential to drive users towards a recyclable product as deconstruction of buildings and recycling or reusing materials is becoming cost effective compared to landfilling.

High temperature microwave furnaces, such as those produced by Spheric Technologies (<http://www.azom.com/news.asp?newsID=11219>), are changing the ceramic industry much as the microwave oven changed our home cooking habits. Microwave heating uses up to 80 percent less energy than conventional gas, electric, or coal-powered furnaces, and it cuts processing time by 90 percent. Microwave heating produces a better ceramic product with fewer defects than traditional thermal methods. The methodology has the potential to bleed into other industries where high temperature processes are needed and where fossil fuel costs have become a driving factor to identify other technologies.

Bringing **natural light** into buildings without the problems associated with controlling heat and light transmission has resulted in another example of potentially disruptive green technologies. Sage Electrochromatics (<http://www.sage-ec.com>) has taken inorganic metal chemistry green, developing a new electro-coating formulation producing a “smart glass” that, when a small charge is applied, can modulate the amount of light and heat conducted through the glass, thus improving the comfort of the indoor space while providing relief to energy bills. The advantages over curtains or sensor-driven shades are no moving parts and less materials, hence lower cost.

Using Green to Innovate

It starts at the problem definition stage. Consider the gallon milk jug. How does one reinvent or improve this product to satisfy the better, cheaper, faster requirement by considering the environment?

The plastic milk container, a 1960s innovation incorporating a carrying handle that allowed eight pounds (1 gallon) of milk to be packaged conveniently, carries a large environmental footprint relative to its size. The polyethylene container is made from non-renewable fossil fuel resources. They cannot be stacked without using plastic crates, which take up significant storage space and must be sanitized and replaced, requiring significant water use and replacement material. Even though the jug is square which improves packing, the crates take up space and some of that space is empty. A hidden part of the environmental footprint is that space conditioning uses energy resources. More trips between the dairy and the store are required because of shipping dead space along with product.

Creative brainstorming a new milk jug goes now beyond mere redesign. It considers the source of the materials used, the natural resources (water and energy) and space requirements needed to move the product from the dairy to the store, and minimizing the waste stream generated. Green innovation is a sturdy, rectangular polyethylene jug that reduces dead space, allowing a 50 percent reduction stacking space without the need for crates. It is sized to fit a standard pallet and is held together with cardboard bands and shrink wrap resulting in a 50 percent reduction in transportation and fuel requirements. The cardboard and shrink wrap are both recyclable, leaving a zero waste stream for the store selling this product. And, the consumer can still recycle the plastic container at home.

Superior Dairy designed this new milk jug system, and it's currently being distributed through Costco, Sam's Club (<http://www.sustainableisgood.com/blog/2008/07/sams-club-squar.html>) and Wal-mart, three companies that understand the value of green innovation. Because the dairy employed a green innovation approach, the price of a gallon of milk in the new package is 20-30 cents less than the traditional milk jug.

Why Innovate Green

1. Cost and resource security. Energy and virgin material costs are no longer stable in the long term. Waiting till oil climbs back to \$140 a barrel is not the time to start thinking about reducing energy or material use. Green innovation can help reduce cost while producing a better product regardless of energy and commodities prices.
2. The market is already looking for green solutions to satisfy government and self-imposed requirements. Wal-mart is committed to greening its supply chain. Green buildings for example comprised 2 percent of all new building starts in 2005; in 2008 it was 6 percent and expected to climb exponentially based on energy and long-term cost concerns. Green buildings have specific material and energy requirements that must be satisfied. If your product or process does not meet those requirements, you have lost a client.
3. Your competitors might understand the potential market advantages and be innovating ahead of you!

Green Partners

The green space is new to many industries. There is no one-size-fits-all approach to green innovation. Every industry has its own needs that must be pioneered. Even so, lessons can be learned across industries, and a third party can help find new applications.

Partnering with experts in green innovation also can help companies understand future green trends, define the products or processes that would significantly benefit from green innovation, help identify a product's real environmental footprint, and assist in seeking ways to position products or processes for explosive growth in the new economy.