



## Sustainability Manufacturing within the PM Industry

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Industry is in the midst of ongoing environmental debates, the most serious since the early 1970s when air quality and toxic pollution became major industrial issues/challenges due to corporate disregard of the health hazards of industrial pollution, debates that culminated in major changes to environmental regulations and the establishment of OSHA and EPA. While the issue of “going green” may be questioned by many manufacturers, the rise of environmental and social issues (now recognized as inseparable) is being driven by the economic growth (*read economic demand*) of developing countries, which growth cannot help but come at a cost to the U.S. standard of living and economic well-being. If we do not begin adjusting our behavior voluntarily, it will be forced on future generations with painful consequences.

The “Green Revolution” is upon us. Prominent and influential business executives in all segments of our economy are recognizing that beyond the financial and national security implications, developing a “green strategy” and addressing the related issues is “the right thing to do.”

Environmental strategists and consultants David C. Esty and Andrew S. Winston suggest there are three basic reasons why moving to a “green”— or sustainable—strategy is important to companies regardless of size. First, “there are people who can shut your business down” absent such a strategy. They can be regulators with onerous penalties behind them or they can be neighbors with an issue enabled by today’s communications tools for influencing local public opinion. Second, the availability, sources, and cost of energy is increasing rapidly. The U.S. possesses 5% of the world’s population and uses/consumes 24% of its energy on an annual basis. What’s to happen when the remaining 95% of the world wants their share? Third, many proactive and imaginative companies have discovered the upside to the green revolution. Their sales are growing and their innovative products are stealing a march on their competitors. Examples of successful initiatives are GE’s “ecomagination” businesses (aircraft, appliances, healthcare) and Toyota’s Prius automobile.

Such leaders as Jeff Immelt (GE) and Ed Woolard (DuPont) have turned their firms around and recognized that their customers and stakeholders (stockholders) have expressed concerns with environmental issues. They, like many others, recognize there are limits to what we can do to or take from the natural world (resources such as water, air, or raw materials). They understand there can be significant social, and hence financial, impacts on real or perceived negative behaviors and practices and that the financial community is recognizing the impact of negative environmental behavior on stock prices and insurance risk that can easily reach catastrophic proportions today. Recently the Organization for Economic Cooperation and Development (OECD) surveyed 10 governments and found that they all consider environmental challenges not as a barrier to economic growth but rather as an opportunity.

The leadership of Rio Tinto, closely aligned with our own industry, has stated “Our personal health, and the health of economies and societies, depends on the variety of ecological goods and services that nature provides.” This recognition of the impact of businesses on biodiversity is just one of the ten primary environmental, green, or as I would prefer to say

sustainability, issues listed in Table I. These are not ranked in any order. The importance or impact of any one or multiple issues will vary by industry or position in supply chains.

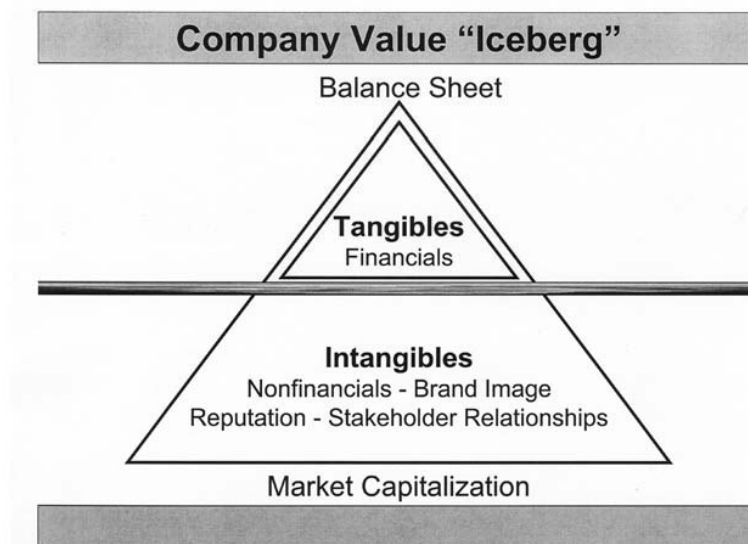
**Table I: Sustainability Issues\***

Climate Change	Air Pollution
Energy	Waste Management
Water	Ozone Layer Depletion
Biodiversity/Land Use	Oceans and Fisheries
Chemicals, Toxins, Heavy Metals	Deforestation

\* from *Green to Gold*, J. Wiley and Sons, Inc.

Attention to sustainability issues is most pronounced among large corporations, as their businesses can be radically affected by share-price fluctuations. Thus, they must not only consider the reliability of raw materials/resources, they must position themselves to avoid undermining their asset base and/or damaging their brand reputations. In many cases today tangible financial assets represents only a fraction of the total value of a firm (Figure 1) and the non-financial assets can be greatly affected by mere perceptions.

Small and medium enterprises (SME) are not immune from these forces, despite the stakeholder issues. SMEs are now finding their “customers” are asking about their “sustainable” nature as part of a larger supply chain. For example, Wal-Mart has asked their suppliers to answer a “sustainability performance questionnaire.” Further, they have initiated a Personal Sustainability Project with each of their 500,000 employees. The impact and force of such a strategy is far more immediate than legislation and regulations. Similarly, Nissan and Hitachi have developed very involved supplier “sustainability programs” to position themselves as a “sincere eco-innovators.” Nissan is rated among the top 50 companies worldwide in corporate social responsibility reporting.



Source: *The Business Case for Sustainability*, Bob Willard

**Figure 1. Company Value “Iceberg”**



The U.S. Department of Commerce (DOC) defines sustainability as “the creation of manufactured products that use processes that are non-polluting, conserve energy and natural resources, and are economically sound and safe for employees, communities and consumers.” One of the key elements recognized by the DOC Sustainability Team is the need for *economic soundness* in all sustainability strategies or initiatives. Successful eco-advantage companies realize they have the best chance for success when they design innovative products to help customers solve environmental problems, push their suppliers to conform and be part of the larger solution, not the problem; collect data and benchmark their actions to justify or support their claims; partner with organizations to find solutions to larger problems; and build a corporate culture to engage all employees in their vision of sustainability.

Manufacturers have the opportunity to impact sustainability on two levels: their process or operation or via the products produced. In some cases the benefits in sustainable or environmental terms for products greatly outweigh the process opportunities. For example, the impact on CO<sub>2</sub> production by eliminating 2 pounds of weight from 11 million automobiles far outweighs the efficiencies in a best-practices fabrication operation. Nonetheless, both sides of the sustainability equation benefit from a thorough and balanced sustainability strategy.

Companies that have elected to develop and maintain Environmental Management Systems (EMS) through ISO 14001 need to only shift and broaden their focus to expand into a sustainability mindset. An effective sustainability management system (SMS) helps to ensure continuity beyond the original champion, provides for ongoing reporting, offers a systematic framework for moving toward sustainability, making companies more proactive rather than reactive, and systematizes best practices and reduces conflicts over projects and priorities.

About 20%–25% of the PM industry’s powder producers and fabricators have already begun the process of addressing these issues by developing Environmental Management Systems, earning ISO 14001 certification.

Faced with doing more with less, sustainability is an environmentally aware shifting of Lean Manufacturing practices. Implementing strategies that recognize areas for continued improvement is good business and expands the opportunities for competitive differentiation. Table II lists areas that can be addressed to define improved sustainability. Sound environmental management is an indicator of good general management. All these elements can add to profitability and success by enabling greater output with fewer inputs.



**Table II: Areas to improve Sustainability\***

Energy	Energy Used Renewable Energy Used or Bought
Water	Total Water Used Water Pollution
Air	GMG Emissions Releases of Heavy Metals and Toxic Chemicals Emissions of Particulates, VOC's, SO <sub>x</sub> and NO <sub>x</sub>
Waste	Hazardous Waste Solid Waste Recycled Materials
<i>Compliance</i>	Notice of Violation Fines or Penalties

\* from *Green to Gold*, J. Wiley and Sons, Inc.

Authenticity matters in brand positioning. As an industry we should have the basic comparative data to support any environmental claims we make.

The consensus among the MPIF Industry Development Board and Technical Board members is that PM is a very sustainable manufacturing process (which includes MIM, HIP, and other powder-based, net-shape manufacturing processes) and that we should position and promote the industry as such to further the technology's marketability and build customer loyalty on green attributes. While PM cannot stand on these green attributes alone, it should add to the value equation. A recent survey of mechanical engineers in the design function indicated that two-thirds of them are involved with designs that use less energy or reduce emissions. PM should be recognized as an enabling technology. Developing a good environmental reputation as an industry can help fend off regulatory mandates, improve the financial "standing" of the industry by demonstrating reduced (or limited) environmental risks to investors, and position the industry with improved regulatory choices such as tradeable emission allowances and better viability as a cooperative industry via plant "Energy Star" program recognition.

A recent statement by a Ford executive said, "The companies that make the high-quality products and services that consumers really value—and do so in ways that limit harm to the environment and maximize benefits to society—will be preferred in the marketplace."

Today's managers distill competitive advantage down to two alternatives: lower costs or differentiated product quality, features, or benefits. The best managers work on both and the strategic advantages of sustainability can be played by similarly cutting operational costs and reducing environmental expenses. Another alternative is to reduce associated environmental and regulatory risk to avoid costs and increase speed-to-market. Using a broader product outlook, managers strive to drive revenues through products that are environmentally focused and of higher quality to meet customer demand. Finally, many companies have found success creating brand value by marketing their "greenness."

Consider what strategic options you can deploy to improve your company's value and contribute to the sustainability of the PM industry and, perhaps in a small but significant way, ameliorate the actions of the past on the world we all share.