

Sustainability Strategies for Manufacturers

Like it or Not, Sustainability will Increasingly Drive Manufacturing System Decisions; ARC's Greg Gorbach Outlines a Framework for Green Improvement

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Developments across the globe continue to put pressure on companies and especially manufacturers to get more "Green" and reduce carbon emissions.

In the US currently, that pressure is still somewhat modest, as opposed to most of Europe, which has already implemented carbon emission limits, penalties and trading.

Still, even now there are a variety of forces pushing manufacturers to focus on sustainability. Those include:

The link between reduce greenhouse gas emissions and reducing sky high fuel and energy costs
Pressure from customers, such as Wal-Mart, HP and Home Depot, to improve sustainability
Attention from environmental and consumer groups relative to carbon emissions (e.g. [the Carbon Disclosure project](#))

Likelihood of increased regulation and carbon caps down the road

Creating more sustainable supply chains and reducing carbon emissions may prove very challenging for manufacturers.

"Today's plants have been designed to produce products of a certain type at a certain quality and rate, but the underlying cost assumptions may not reflect emerging requirements," writes **Greg Gorbach**, an analyst at [ARC Advisory Group](#), in a recent research report. "For example, the original design parameters probably didn't consider the carbon burden associated with the physical plant. And while energy usage may have been a consideration, many older plants were designed with the assumption that energy costs would remain constant."

"Production efficiency" now takes on a new dimension and meaning. New scheduling algorithms may explicitly include energy consumption and carbon emissions in developing optimal factory schedules.

Green Manufacturing Framework

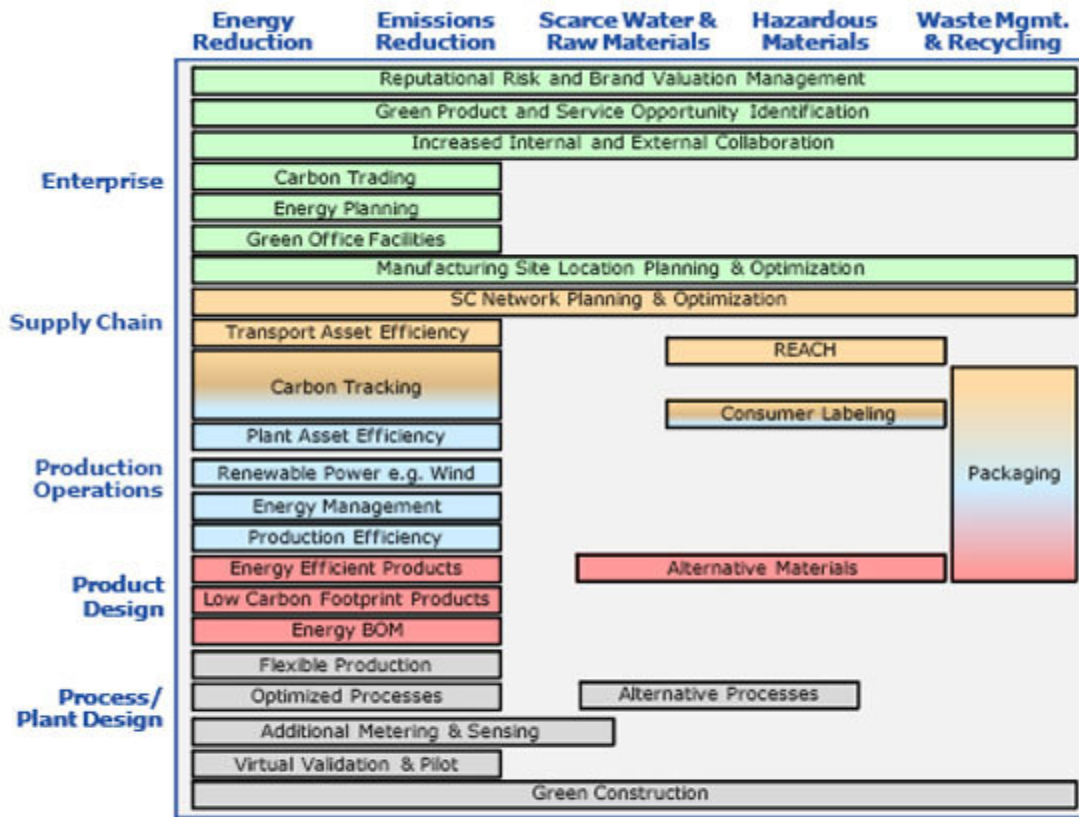
In his report, **Sustainable Manufacturing: Re-making Today's Manufacturing Enterprise for Tomorrow's Economy**, Gorbach offers an interesting framework for manufacturers to use when developing sustainability strategies. (See illustration next page)

Gorbach also offers the following list of areas to focus on to improve sustainability in manufacturing:

Energy Planning and Visibility: Establish a "high resolution view" of current energy consumption and emissions, and establish specific goals and targets – perhaps using activity-based costing type analysis to account for contribution to emissions for products and processes.

Energy Reduction: Substantially new approaches to energy usage may be required. Nissan, for example, has implemented real-time energy management systems in its Japanese plants, and introduced the concept of "energy unit" as a control mechanism.

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Elements of Sustainable Manufacturing

Source: ARC Advisory Group

Go Lean: Lean techniques already offer an array of benefits to manufacturers, but should also remove carbon emissions by reducing non-value-added activities.

Plant and Transportation Asset Efficiency: Companies will need to review current plant and transportation asset energy efficiency and make decisions with regard to upgrading, replacing or retiring those assets.

IT Asset Rationalization: There may be many opportunities to reduce plant energy consumption by rationalizing, virtualizing, de-duplicating, or otherwise reconfiguring IT assets in the factory.

Alternative Power Options: Increasing numbers of companies are looking at alternative power sources such as wind, solar, hydro-electric or geothermal. Some companies can even sell power back to the grid.

Water Management: This is likely to become increasingly important, especially in the Western US and other areas of relative water scarcity. Water conservation, recycling, and waste processing will become urgent issues for some manufacturers.

Waste Management: Wal-Mart is already looking at waste levels in its supplier base. Manufacturers will need to plan, monitor, document and improve solid and non-solid waste generation, including the

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activities of suppliers.

Asset Lifecycle Management: Energy consumption and carbon emissions will become increasingly important in asset lifecycle analysis. For example, many electric-powered assets may be running inefficiently or idling excessively.

Production Efficiency: "Production efficiency" now takes on a new dimension and meaning. New scheduling algorithms may explicitly include energy consumption and carbon emissions in developing optimal factory schedules.

Supply Chain Network Design: Just as with supply chain costs, the majority of a company's carbon footprint will be locked in by its supply chain network design. Energy and carbon emissions will be increasingly important factors in the network analysis.

"Management must establish priorities, make the required trade-offs, and implement effective management control systems," Gorbach concludes. "Such systems will incorporate real-time visibility, shared targets [across functions and partners] and accountability."