Being Green is Good Business

The issue of going 'green' has never been more topical. In a recent statement on the topic of climate change by the Secretary General of the United Nations, Ban Ki-moon, he stressed that if no preventative action was taken the world would face the real and dreadful possibilities of drought, mass famine and rising sea levels. The impetus for change, therefore, is now more urgent than ever - a consequence being dramatic revisions in the policy of companies across the manufacturing industry – although the previously uneasy relationship between Manufacture and the Environment is not one that is easily resolved. Numerous organisations, however, well-known to us all, have and continue to create significant business on the back of their eco-friendly move. Let them be the models to which many other companies will aspire.

Of course the prospect of going 'Green' can mean different things to different industries. Take for instance the auto industry. Green could, for instance, mean limiting the 'carbon footprint' (an eco buzz-phrase) of the manufacturing process of a vehicle. How it's made, where it's made and what it's made from. It also could concern the carbon costs of the in-service life of the car. How much, and what type of fuel it uses. It could further refer to how 'enviro-friendly' the product is in use; how many disposable or replacement parts it consumes during its life and how much it costs (in environmental currency of course) to maintain and ultimately dispose of/recycle. An interesting debate in the motoring world emphasises the both the complexity and sensitivity of the issues. A report by CNW Marketing Research, Inc. entitled "The Energy Cost of New Vehicles From Concept to Disposal" provides interesting reading on the 'Dust to Dust' energy cost of a broad set of passenger vehicles. The lower (worse) ranking in the league table of the Prius (a hybrid electrical-petrol voted 2005 European Car of the Year) as compared to the infamous 'gas-guzzling' Hummer certainly must've set the vehicle-cat amongst the manufacturer-pigeons! Indeed comments on Toyota's own US web site reflect this (http://www.toyota.com/html/dyncon/2007/september/hummervprius.html).

Whatever the case, manufacturers are coming under increasing pressure to reduce the detrimental effects of their product on our environment. The world and its media, specifically in those countries with developed economies, care about the environment - greatly. Manufacturers are becoming increasingly aware of the potential financial and/or legal penalties of their non-conformance; the negative P.R effects can be significant. On the flip side however, being seen to be supportive of the green movement has an undeniable promotional up-side. Consumers like green. One only has to look at the plethora of environmental marketing campaigns to imagine the huge funds pumped in by the companies behind them. Indeed within the business sector the quantity of published 'green' literature often rivals that of investor and product information. It has to be said, then, that making money from the adoption of green policy is by no means a given, particularly in the initial phase of implementation.

Ultimately consensus shows manufacturers' main concerns with the prospect of 'going green' can be summarised under two umbrella headings; Regulatory Compliance and the 'Carbon Footprint' of their product and the lifecycle processes around it.

It seems fair to say that most industrial manufacturers have an informed grasp on the whys and wherefores of regulatory compliance. Certainly in the more developed nations. Yet in some emerging economies a number of companies seem to have objectives, costs or methods that somewhat undermine the concept of compliance. Examples of this non-compliance are an all too frequent occurrence – the recent toy recalls by Tyco most immediately spring to mind. Of course they make excellent press, particularly for the more sensationalist media publications; the effect they have on the manufacturer's sales and reputation, however, far outlasts the story's run in the news.

On the regulatory issue, moreover, one of the major challenges, particularly for global manufacturers, is the ever-increasing burden of differing standards (albeit in some cases slight). Often these are put in place to enforce similar objectives within different nation states or, as is the case with the European Union, across the member community. This adds further complexity in many, sometimes disparate areas, of the business and extended community. Ensuring compliance through often complex supply chains creates new challenges and generates spiralling overheads. Many companies, including Oracle's Agile PLM group, find opportunity in this endemic problem – they aim to help companies operationalise some of the complexity of compliance into repeatable business processes. Larger companies have well-stocked teams allocated to the management of these challenges although the fact of the matter is that smaller companies do not have this option. On a micro level therefore, compliance once again becomes a problematic issue.

The manufacturers' second most pressing concern – the 'carbon footprint' is another complex term. The frequent discussions around the phrase have lead to it meaning many different things to many different people. In the context of this article (and for the sake of brevity), let us limit the term to the environmental implications of creating, producing, using and destroying/recycling of a product.

We all know that natural resources are becoming more costly, and indeed some of what was once used has now been deemed potentially harmful to us and our environment. One just has to look at the cost of oil, copper, zinc or pretty much any other commodity used in the manufacturing process to see this first hand. What these escalating costs and dwindling supplies mean to a manufacturer is that the careful selection of material and quantity play much more important role in the design of a product. Obviously this has not gone unnoticed by the Engineering Software community, with the likes of Siemens embedding knowledge-based functionality to run online checks on material selection and weight based on the products' requirements. Vendors such as SolidWorks and Autodesk also believe that the contemporary concerns informing materials selection and part compliance greatly influence the value they can add to 'green' design processes. Although all agree that this is important, only a few vendors can help to ensure that this is a practical reality through the supply chain. Dassault systems cites the need to consider 'eco-issues' at the earliest possible instance and have even employed a Eco-Design fellow to analyse the issues of sustainability at the very earliest stages of a products lifecycle, namely consumer marketing, conceptual and industrial design.

When it comes to the 'greenness' of the product *in use*, its green credentials can be measured in many areas, including operating efficiency, reliability and upgradeability. The remarkable improvements in performance of many of the products on the market today bear testimony to the ingenuity of the engineer as well as provide hope for further eco-friendly improvements in the future. Many would argue that the products we design and make continue to improve due, not only to the skills of our engineers, but also to the ready availability of advanced data management, design and simulation tools. An obvious advantage of the use of these is that companies can perform more design iterations with greater certainty of form and function to ultimately achieve a better product in a reduced timeframe.

But the 'green' value of a product isn't just about form and performance. It varies in aspects such as the energy and materials used in the entire manufacturing process. What chemicals and substances are used in the manufacturing process? How much energy does it take to fabricate and assemble the product? What tooling and resources are required and what are the logistical environmental overheads? All these are important questions a manufacturer attempting to 'go green' must ask himself. Thus to this end, features are continuously being embedded in design products to make it easier and easier for manufacturers to design and test for assembly. In addition, virtual digital manufacturing products are moving to a point where their value is more visible through, not only the validation, performance and installation of production facilities, but also in ensuring better energy efficiency throughout the entire manufacturing process.

At the end of the life of a product it must be disposed of and if possible recycled. Although many companies dedicate time and technology to the understanding and selection of materials better suited to reuse or disposal, many are now working on developing techniques which make it easier to disassemble products for recycling. Such initiatives are motivated, no doubt, by directives such as the 'End of Life Vehicle regulations' and 'Waste Electrical and Electronic Equipment policy.'

Compliance is simply not an option. The issues surrounding the 'Green debate' undoubtedly add complexity and cost to manufacturers and their supply chain, which need to be minimised. Certainly vendors in the IT sector can help, but who can contribute where and at what cost? Big questions, but ones which we will hopefully have the opportunity to debate further in subsequent discussions in 2008.

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