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What Does it Take to Innovate in Today's Green Market?

Due largely to growing market interest in ecological consciousness, green products can stand out to customers. In some cases, green is a phenomenon that has the potential to turn commodity products into highly differentiated ones or enhance the value of a brand. It is no surprise, then, that Aberdeen Group's August 2008 study *Greening Today's Products: Sustainable Design Meets Engineering Innovation* found that 62% of manufacturers are currently pursuing green product development initiatives. Despite this, green remains a foreign concept for many product development professionals, who can have a difficult time justifying high investment costs with market differentiation. Aberdeen's research suggests that Green doesn't have to be a burden, but often requires taking a different view of innovation.

What is Sustainable Innovation?

Attention to the environmental impact of a product has traditionally been driven by regulatory bodies and the bottom line penalties that can be incurred when companies fail to comply. Green product or sustainability initiatives, however, are more often driven by top line incentives and attention to consumer preference. In fact, Aberdeen Group's August 2008 study *Greening Today's Products* found that the top two drivers of green products are corporate responsibility programs (reported by 37% of respondents) as well as the improved competitive differentiation that green products provide (35%). Both pressures are about gaining the attention of ecologically sensitive customers, either at the product or enterprise-level.

Narrowing a broad concept like green, or environmental friendliness into a product definition can be difficult. What is a green product? Green can enter product development in a number of ways. On one hand, it can mean a greater focus on incorporating recyclable materials or components within the product. Some green initiatives are focused on the development of products that consume fewer natural resources or release less toxic emissions. For others, a green product development program means simply that the methods used to design and manufacture the product are more ecologically benign.

The Burden of Introducing Green to Product Development

Optimizing products or processes for environmental impact rather than simply to meet regulatory requirements introduces a host of new problems for engineering departments (Table I). The top challenges Aberdeen

Analyst Insight

Aberdeen's Insights provide the analyst perspective of the research as drawn from an aggregated view of the research surveys, interviews, and data analysis

"One of our product lines had been adopted by competitors years earlier. As we entered the market, differentiation was quickly reduced to price competition. We pursued higher level controls and adopted a green design strategy to change that. Was it worth it? Absolutely. We didn't anticipate this much success, but after being offered for about two years, it has become the #1 line the last two quarters."

~Eric Bostrom
Engineering Manager
Automotion, Inc.

uncovered range from the difficulty of measuring the ROI of a green initiative to the high investment costs required to develop these technologies. As a group, these challenges call attention to how foreign green can be to many product development organizations as well as the investments in new technologies and materials that some must make to catch up.

Table 1: Top Five Challenges Developing Green Products

Challenges	All Respondents
High expense associated with developing new technologies that are green or compliant	43%
Regulations differ widely according to regions or countries around the world	30%
Difficulty measuring unconventional ROI on green products	25%
Difficulty in understanding applicable regulations due to exemptions and shortage of knowledgeable employees	24%
Greener materials and technologies require new and large capital manufacturing investments	24%

“Green is definitely worth doing but it can be hard to understand the ultimate benefit to green when the high cost is making the product more expensive. It’s very hard when you lose a sale to a competitor that isn’t green and their product comes at a lower cost.”

~ Engineer
Consumer Goods
Manufacturer

Source: Aberdeen Group, August 2008

In many cases, materials required to develop a more ecologically friendly product come at a higher price than the materials that have been traditionally used. However, these findings indicate that more often the high cost of green is associated with the challenge of developing new, green technologies (43% of respondents). Developing green products often requires product development teams to contemplate factors, materials, and approaches that they traditionally would not have considered. While the materials themselves can be more expensive, the costs of identifying materials that can be used and assessing their impact on product performance can be much more formidable.

'Going green' also involves designing for more efficient use of resources or release of emissions. This often requires new ways of looking at product performance, or in some cases developing new systems that monitor and control emissions and resource consumption. For the engineer traditionally tasked with assessing product form, fit, and function; the learning curve of green can be rather steep. For executives the mounting development costs associated with this learning curve can be painful, particularly when the success of green initiatives are harder to measure using traditional standards of product development performance. Product development teams can find it difficult to justify the investments that must be made for green.

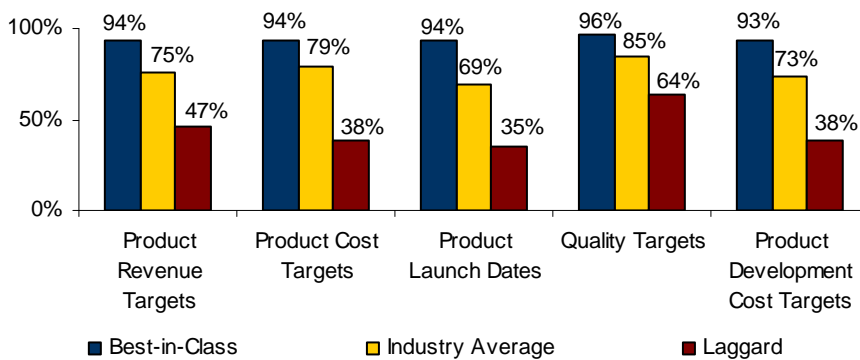
Some of the challenges associated with green product development are carryovers from regulatory compliance. As companies attempt to enter a larger range of regional markets, they encounter multiple, differing sets of regulations that they must address (30%). In many instances, these regulations are becoming stricter than they had been previously. The result

is a web of sometimes conflicting regulations, making it difficult to simply understand what applies to a particular industry. Twenty-four percent (24%) of the respondents to Aberdeen's [Greening Today's Products](#) reported that difficulty understanding these regulations and a lack of knowledgeable staff are critical hindrances to the development of green products.

Aberdeen Analysis

In order to understand how companies effectively bring green products to market, Aberdeen Group surveyed over 360 discrete and process manufacturers between June and August 2008. Participating companies were benchmarked according to five key performance criteria. Using these metrics, Aberdeen categorized respondents into the top 20% (Best-in-Class), the middle 50% (Industry Average) and the bottom 30% (Laggard) of performers. Figure 1 displays the performance gaps that define each category.

Figure 1: The Maturity Class Framework



Source: Aberdeen Group, August 2008

The investments required for green don't just impact the cost of a product; they can also delay development, causing companies to miss key market windows. The maturity class framework highlights the penalties of failing to meet the challenges of green, with Laggard organizations missing 65% of their targeted launch dates and exceeding direct product and development budgets for 62% of their products. The Best-in-Class, by contrast, meet all five metrics Aberdeen measured on a 93% or better average. What this means, in effect, is that the Best-in-Class are able to realize the market benefits of green products, while avoiding the strain on their product development organizations.

Introducing Green to Product Development

How do they do this? The difference lies in how these leaders view green. Rather than implement green as a massive change in process or conception, the Best-in-Class adapt what they have in place. Instead of developing new technologies, these leaders find ways to leverage existing technologies that

can be applied to their products and business in order to help them alleviate the high investment costs that are generally associated with green.

The Best-in-Class mix brainstorming and research efforts to identify new solutions. This approach eases the burden of R&D while still taking advantage of internal resources to leverage fresh ideas that have not yet been introduced to the market. A good example of how this works can be seen in how the Best-in-Class approach the satisfaction of energy and emissions requirements (Table 2). Here, they are about as likely to brainstorm new ideas and concepts as investigate existing ones, but more likely than their competitors to do either.

Table 2: Two Paths to the Green Product

	Best-in-Class	Industry Average	Laggard
Capabilities	New and existing materials and technologies are investigated as a means to satisfy energy consumption or emissions requirements		
	64%	57%	39%
	New ideas and concepts are brainstormed as a means to satisfy energy consumption or emissions requirements		
	60%	59%	40%

Source: Aberdeen Group, August, 2008

The Green Innovation Process

While the order of magnitude may differ, the challenges of producing a green product are fundamentally the same as those that are encountered when introducing any new concept to development. First and foremost developing green products is a problem of innovation. The ability of Best-in-Class companies to bring green products to market while minimizing the strain that is placed on their product development organization is founded in the approach that these leaders take to innovation.

Specifically, Aberdeen Group's December 2007 [Product Innovation Agenda 2010](#) found that the Best-in-Class don't accept the notion that innovation is a haphazard element of product development. Instead, these companies view innovation as a predictable process (Table 3). There are two steps that the Best-in-Class take to transform innovation into a process. One is to assign process owners for innovation within the product development organization. Sixty-eight percent (68%) of the Best-in-Class dedicate ownership to innovation, but they don't stop there. In order to promote continuing improvements the Best-in-Class track and measure innovation performance with formal metrics. The use of these metrics to track something as idiosyncratic as innovation may seem counter-intuitive. However, while the majority of companies do not currently have measures to track innovation, the Best-in-Class are 64% more likely than Industry Average and four-times more likely than Laggard performers to do so.

“To improve product innovation, we recruited a new business development director to manage the increased emphasis on innovation and new product development. We have also increased our product development budget significantly and set stiff targets in terms of percent of sales from new products.”

~ Manager, Industrial Equipment Manufacturer

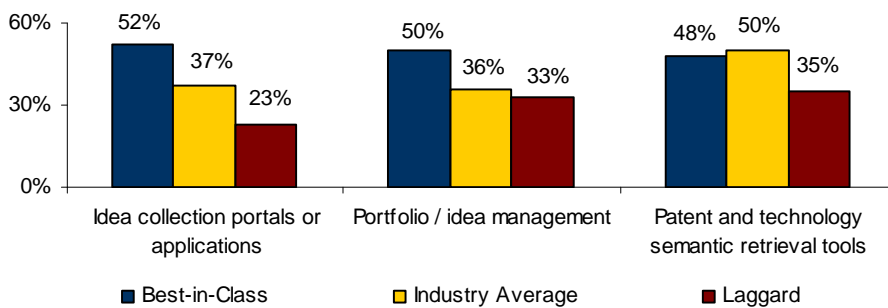
Table 3: Capabilities Supporting the Innovation Process

	Best-in-Class	Industry Average	Laggard
Measure innovation performance with formal metrics	36%	22%	9%
Process owner for the innovation process	68%	49%	30%

Source: Aberdeen Group, December 2007

The Best-in-Class are also more likely to support these efforts by adopting a set of tools that have the potential to help take the heavy lifting out of innovation (Figure 2). These tools help the Best-in-Class to transform innovation from an accidental occurrence to a renewable resource.

Figure 2: Technology Enablers Supporting the Innovation Process



Source: Aberdeen Group, August, 2008

It begins with the use of idea collection portals and ideation management solutions to help collect and manage new ideas within and even outside the organization. The Best-in-Class are 40% more likely than the Industry Average to use these tools, but this is only the first step to how they enable innovation. Once new concepts and ideas are collected, the Best-in-Class are also more likely to evaluate which technologies to introduce into product portfolios as well as which products to commercially bring to market using portfolio or idea management tools. These tools in particular support the Best-in-Class view of innovation as a diligent and purposeful process that can be tracked, assessed, and managed.

Instead of developing new technologies, the Best-in-Class are exploring existing technologies that can be applied to their products and businesses in new ways. The Best-in-Class recognize that innovation is not something that happens in a vacuum and that they need to use innovation software that allows them to leverage existing technology from various industries as well as research patents and technology trends. These semantic-based innovation tools allow them to investigate and sift through a world of existing technologies quickly and efficiently. They are 37% more likely than the Laggards to use these tools to locate existing patents and solutions for

problems that may have already been solved by someone else, avoiding many of the cost and research burdens of innovation. These tools provide a final pillar to the Best-in-Class process of innovation, and can impact how these leaders approach sustainable development in a number of ways.

Validating Concepts Upfront

At the most elementary level, semantic research tools provide the ability to validate product concepts before any investment is made. By accessing existing technology patents through semantic, topic-based concept retrieval software the Best-in-Class are able to locate when and how a similar idea has been tested or leveraged successfully. As a result, these companies avoid the gamble of investment, validating a concept before developing it.

For the Best-in-Class, this early validation approach is a rigorous component of the entire product development process. Aberdeen Group's June 2008 [Engineering Executive's Strategic Agenda](#) found that the Best-in-Class are 41% more likely than the Industry Average to validate product development decisions through the early use of simulation. These leaders take advantage of simulation tools to identify and resolve as many issues as possible early on in the design phase, heading off problems before they can have a substantial impact on product development budgets and schedules (Table 4). This includes checks of product substance quantities against regulations and requirements as well as analysis of the raw material costs of the product design. Semantic-based innovation tools provide an earlier version of this process, validating ideas before they become designs.

Table 4: Validating Products

	Best-in-Class	Industry Average	Laggard
Process	Check product substance quantities against regulations and requirements		
	85%	67%	65%
	Analyze the raw materials costs within the product		
	84%	77%	67%

Source: Aberdeen Group, June, 2008

Filling in Gaps in Expertise

Green introduces problems that haven't always had the highest visibility in product development. Deciding to make sustainability or eco-friendliness a goal for your products, doesn't necessarily mean that the staff on the design team is equipped with a sophisticated understanding of green requirements. In fact, two of the top challenges of green product development isolated by Aberdeen's [Greening Today's Products](#) are keeping up with changes in regulations by region (30%), and difficulty understanding the applications of regulations (24%).

Product development teams can be hard pressed to keep up with all of the applicable regulations let alone how to minimize the environmental impact of a product. Patent and technology semantic retrieval tools help the Best-in-Class to fill in their blind spots by accessing what has been done in other industries and fields. This allows for influx of new ideas and solutions that lie outside the experience of their design teams.

Identifying and Swapping In Green Solutions

Going green is not necessarily about developing totally new products. A lot of companies have the opportunity to go green merely by changing some of their components. Sometimes this can mean adding the means to monitor and control energy consumption. In others, it can be about no more than the recyclability of the materials that make up a product. Function modeling supported by semantic retrieval technology allows Best-in-Class companies to identify what materials and components can be replaced with more ecologically friendly components without assessing the performance of the product with a physical model, or even a simulation.

Recommended Actions

The Best-in-Class don't view green as a massive change in their processes. Instead they incorporate green in the same way as any innovation goal and apply a diligent and purposeful investigation of ideas, concepts and technologies. In this way they are able to innovate products that are economically as well as environmentally sustainable. The ease with which the Best-in-Class have been able to negotiate the turn to green can provide encouragement to companies seeking to profit from sustainability. Doing so effectively requires that these companies are prepared to take the guesswork out of innovation, something the Best-in-Class accomplish by taking the following steps:

- **Identify an Innovation Owner.** The Best-in-Class are over twice as likely as Laggards to identify a process owner for innovation. Securing this role can go a long way to demystifying innovation and transforming it into just another process of product development to be managed.
- **Track and Measure Performance of Innovation.** This is a step in the same vein as an identified process owner. Creating formal measurements helps transform innovation into just another process and can help to provide a framework that supports the incorporation of new ideas as they occur as well as identify the factors at play when they don't.
- **Leverage technology to support Innovation.** The Best-in-Class leverage technology in two ways to support the innovation process. One is to capture and identify the market viability of new ideas internally; the other allows them to borrow from the failures and successes of others. It is this second approach, the use of innovation software with semantic-retrieval capacity that enables the Best-in-

Class to avoid the heavy investment burdens of green product development.

For more information on this or other research topics, please visit www.aberdeen.com.

Related Research

[Greening Today's Products: Sustainable Design Meets Engineering Innovation](#);
August, 2008

[The Engineering Executive's Strategic Agenda](#); June, 2008
[Product Innovation Agenda 2010](#);
December 2007

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