GO BEYOND COMPLIANCE FOR PROFITABILITY AND ENVIRONMENTAL SUSTAINABILITY

Seamless PLM with Compliance Provides True Eco-design

Contents

Executive Summary

Forward thinking Fortune 500 CEOs find that environmental sustainability strategies are delivering significant benefits to their bottom line. Analyst reports confirm that pro-green policies and practices, coupled with a Product Lifecycle Management (PLM) strategy, are competitive differentiators. According to AMR Research, "integrating sustainability in to product and packaging development requires innovation and a full, closed-loop product lifecycle environment."1

Eco-design is based on a strategy that considers the environmental impact of a product's design throughout its lifecycle, combining environmental sustainability and profitability. The financial and environmental benefit of eco-design reaches its full potential when used in conjunction with product development processes implemented through PLM.

PLM enables companies to manage information about their products within a single information environment — from initial concept through to manufacturing and after-market service. Moreover, PLM ties together all product-related processes, data, and non-product documentation.

This whitepaper addresses how a PLM strategy helps companies achieve profitability targets while meeting global compliance regulations and helping the environment.

A PLM approach, combined with a compliance-enabled solution, delivers a higher return on investment (ROI) by providing full regulatory visibility across the enterprise and supply chain. For example, a major Tier 1 automotive supplier using PLM software developed by Dassault Systèmes, realized timesaving improvements of 40% to 95% across multiple functional roles, and cost savings greater than $20 million over three years.

Eco-design and PLM allow companies to:
- Improve product quality by removing information silos that prevent collaboration and reuse of intellectual property (IP)
- Provide accurate audit information and traceability by verifying and integrating product compliance specifics at every step of the product development process
- Speed time to market by avoiding late-stage design changes that often cause product delivery delays
- Lower costs by building compliance mandates into the product at the concept level
- Enhance brand identity by enabling the successful implementation of an eco-design strategy for product design

Companies pursuing an eco-design strategy using PLM and a compliance solution will have access to processes and tools for measuring, tracking, and optimizing their environmental footprint. Dassault Systèmes products have a proven record for helping companies effectively and accurately manage their environmental compliance issues. Today nine of the top 20 global Automotive Tier 1 suppliers use Dassault Systèmes software solutions.

> *"An eco-design approach provides real-time visibility and management of the entire product lifecycle (procurement, manufacture, use, and disposal). This cradle to grave approach enables the enterprise to optimize the use of raw materials, ensure compliance to environmental norms, and improve energy efficiency wherever possible."*
>
> Mike Zepp, Director –
> Material Compliance Solutions, ENOVIA

Beyond Compliance

Today, implementing an environmentally sustainable product development strategy provides benefits that extend beyond simply complying to government regulations such as:

- Differentiating your company or product brand image with green policies and practices that demonstrate corporate social responsibility.
- Attracting socially conscious customers and investors interested in environment-friendly corporations.
- Increasing goodwill and positive press as a company that works to lessen its impact on the environment

These benefits are confirmed in an Aberdeen Group study of companies that chose environmental sustainability:

- 37% are developing green products as part of a corporate social responsibility initiative
- 35% say green products offer greater competitive product differentiation
- 28% responded that environmentally conscientious customers demand products that are more eco-friendly

Eco-design Sustains the Environment and Profitability

What is Eco-design?

Eco-design is an environmental strategy that manages the environmental impact of a product's design throughout its entire lifecycle. Increasingly companies are embracing eco-design because of consumer and government driven calls to reduce a product's impact on the environment.

As compliance regulations increase, companies that can point to how they manage their "environmental footprint" have an edge on their competition. Whether companies institute energy saving policies in their facilities, produce environmentally friendly products, or align with charitable activities that support environmental concerns, consumers want proof of their sincerity. Using eco-design as part of a green or environmental sustainability mission becomes a competitive differentiator.

A report by The Boston Consulting Group noted that end consumers are willing to pay more for green products if they believe that the products are healthier, safer, or better for the environment.[2] These results indicate clearly that consumers are holding companies to a higher standard today and will "repay" the pro-environment companies with their business.

Companies pursuing an eco-design approach will have the tools and processes for measuring, tracking, and improving the company's environmental footprint. Eco-design means:

- Giving design engineers full and instant access to the latest environmental compliance data so they can make design decisions (i.e., which part or supplier to use) based on product compliance
- Involving the entire supply chain proactively in reducing the product environmental footprint
- Managing enormous volumes of product data relative to "materials of construction" and "chemical formulations of materials," and using that data as part of the product development process to ensure the lowest environmental impact during the product's lifetime

Eco-design for Sustainable Profitability

To implement an eco-design strategy, companies need to build environmental awareness into their product development processes using Product Lifecycle Management (PLM). PLM, with a compliance-enabled PLM solution, provides companies with full product regulatory compliance visibility across their entire eco-system of suppliers, customers, and partners.

Today, many global companies store compliance-related data in outdated and siloed information systems based on homegrown databases and spreadsheets that are not compatible. Meeting compliance regulations effectively is almost impossible because the data is redundant, inaccurate, and difficult to access on a global level. As a result, innovation falters because of a lack of data integrity.

Successful companies have solved these challenges by implementing a PLM approach based on a single data repository that incorporates automated processes for gathering and storing information. The result is an accurate "single version of the truth" that can be federated across the organization (for example, Enterprise Resource Planning and Customer Relationship Management Systems) for efficient global collaboration.

PLM integrated with compliance enables these organizations to use the right information, at the right time, adhering to compliance regulations at every step along the product development path. A PLM compliance solution provides full regulatory visibility across the enterprise and supply chain, allowing companies to:

- Improve product quality by removing information silos that prevent collaboration and reuse of intellectual property (IP)
- Provide accurate audit information and traceability by verifying and integrating product compliance specifics at every step of the product development process
- Speed time to market by avoiding late-stage design changes that often cause product delivery delays
- Lower costs by building compliance mandates into the product at the concept level
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Dassault Systèmes conducted a business value assessment of a compliance-enabled PLM solution at a major Tier 1 automotive supplier. [3] The assessment on the labor and cost savings showed time savings improvements of 40% to 95% across various roles, and cost savings greater than $20 million dollars over three years. The Automotive Tier 1 Case Study (see page 7) outlines one aspect of what can happen when compliance or eco-design is not part of normal business processes. It is critical that environmental compliance be managed early in the product development process because the cost impact of design changes in manufacturing, or late in the product design process, can be enormous.

The following metrics provide "order of magnitude" examples of how our customers are measuring and viewing the potential for business transformation from PLM in their organizations. These examples are compiled from business value assessments validated by Dassault Systèmes automotive and transportation customers.

Operational Metrics (Average Improvement/Reduction %)	
Time Searching for Compliance Data	75-90%
Time Re-Keying or Entering Data	95%
Time Managing Compliance Projects	50%
Time Statusing, Reviewing & Reporting	40%
Time Synchronizing Data Between Systems	95%
Time Collecting Data from Suppliers	75%

Revenue Metrics (Average Improvement/Reduction)	
Cost of Launch Delays or Recalls	> $1,000,000
Staff Reallocation	> $400,000
Staff Avoidance	> $200,000
External Consultancy Reduction	> $100,000
Lost Sales	Unmeasured, but significant
Goodwill	Significant but subjective

Dassault Systèmes PLM Compliance Solution

Meeting environmental compliance throughout the product development process is a must for companies that operate globally. Companies that adopt proactive environmental compliance strategies by integrating eco-design technology alongside best-in-class product development business processes can realize a competitive advantage.

ENOVIA® Materials Compliance Central™, a Dassault Systèmes compliance solution, helps companies achieve compliance, a higher Return on Investment (ROI), and drive eco-design by:

- Eliminating synchronization of data between disparate systems
- Improving compliance declaration collection efficiencies
- Streamlining compliance declaration analysis and management
- Maximizing reuse of compliant components and suppliers
- Removing compliance reporting inefficiencies

"Ensuring that our products comply with key international material compliance and environmental regulations will be a crucial element of our long term business success and commitment to green initiatives as we look to expand overseas. The deployment of Dassault Systèmes' ENOVIA Materials Compliance Central represents a significant investment enabling us to proactively manage all of the reporting and analysis requirements for all of the thousands of parts and multitude of suppliers involved in the development of our products."

Li ShuLi, Deputy President,
R&D Center, Great Wall Motor Company

What Leading Companies Do to Sustain the Environment

As eco-design gains momentum, global companies are eager to enhance their brand identity and draw positive press and goodwill as environmental leaders. Companies such as Toyota Motor Sales and Johnson Controls, for example, issue an entire annual report focused on communicating their green corporate social responsibility. And, Toyota has made the environment a management priority in several other ways including developing an Eco-Vehicle Assessment System (VAS) that sets environmental impact reduction targets for that vehicle.[4]

Great Wall Motor Company (GWM) Limited, the largest commercial pickup and SUV manufacturer, in China, is establishing an enterprise-wide compliance platform to promote eco-design. GWM, a Dassault Systèmes customer and user of the ENOVIA Materials Compliance Central solution, views social responsibility and eco-design as core elements of its mission.[5]

A major Tier 1 automotive company uses the ENOVIA Materials Compliance Central solution to track the quantity of certain substances in manufacturing scrap in order to minimize the hazardous substance content sent to landfills and maximize the amount of valuable scrap extracted (i.e., gold, silver, platinum).

In Japan, some High Tech companies have begun tracking and measuring the carbon footprint of their products. The companies' management believe this monitoring will enhance their brand image with customers by making a positive impact on the environment.

Japanese car manufacturer, Subaru, saved millions of dollars at its Indiana (United States) plant by using green "thinking" to revise processes, conserve energy and working with suppliers. A willingness to work on green initiatives is a major Subaru criterion when selecting suppliers. Subaru's agreement with its steel suppliers has reduced its scrap by more than 100 pounds per vehicle since 2000.

Automotive Tier 1 Case Study

Problem

A Tier 1 automotive supplier had to dispose of one million unwanted components when product testing discovered lead in the product, rendering the component useless because the company did not comply with customer and market regulatory requirements. In addition to a possible tarnished public image, the supplier faced a costly disposal problem and product delays until a compliant replacement component could be sourced.

Root Cause

The Tier 1 supplier resourced a component to a low cost labor center. Due to information silos and the lack of a centralized resource, the Tier 2 supplier did not receive the proper information about product quality conformance. When an Original Equipment Manufacturer (OEM) insisted on testing the new supplier's component to ensure compliancy, the Tier 1 supplier discovered the substance violation. The lack of communication across organizations and missing documentation, including a critical chemical substance declaration certificate, contributed to the error.

Company Reaction

Following the error, the Tier 1 supplier implemented strict data exchange and verification processes that included a compliance solution integrated with its Product Lifecycle Management system. Purchasing received training on the new procedure designed to ensure that the error did not occur again.

How to Avoid this Situation

This company did not have a PLM solution or an eco-design approach in place. The Tier 1 supplier would have avoided their costly problems if the company proactively managed its product compliance. Ultimately, the company made the decision to use a compliance-enabled PLM system as part of a broad strategy

to enhance its environmental sustainability while simultaneously reducing the cost of product compliance verification.

A key feature of a compliance enabled PLM system is ONE database accessible in real-time by all functions of a company. This 'single version of the truth' or single data repository ensures effective collaboration across all engineering and business functions, and well-documented business procedures and processes

Why Implementing a PLM Strategy with Seamless Materials Compliancy Makes Strategic Business Sense

- Full interoperability between our material compliance solution and other business processes enables you to implement a truly optimized eco-design approach
- Simplifying the entire change management process (e.g., parts, design, material changes, etc.) drives consistency and reduces costs through the ability to design for compliance. A single source of data (compliance and design data in one platform) simplifies the supply chain data collection process delivering higher product quality
- An easy-to-use supplier portal provides an automatic way to aggregate compliance data from your supply chain, eliminating time-consuming tracking and communication breakdowns that result in costly mistakes
- Simple integration (i.e., desktop tools, CAD systems, ERP, and procurement tools) with your existing software systems - leveraging ENOVIA's out-of-the box solution – ensures no interruption of your business
- Rich option for leveraging the universal language of 3D for more life-like and immersive presentation of the compliance issues within a product design
- True traceability of compliance data and processes throughout the development cycle lowers development costs and rework by bridging the communication gap between all disciplines – from product management and design to product launch teams

Summary

Companies that include environmental sustainability in their business strategy have a greater opportunity to grow market share, enhance their brand image, and increase profitability. Successfully implementing such a strategy lies in developing and manufacturing products that are built with compliance directives in mind from design through retirement. A PLM strategy, coupled with a compliance-enabled solution, helps companies successfully implement an eco-design strategy for higher profits and a positive brand image.

END NOTES

1. AMR Research, Crossing the Great Divide: Sustainability as Corporate Strategy, September 2008

2. The Boston Consulting Group, Capturing the Green Advantage for Consumer Companies, January 2009

3. Dassault Systemes Business Value Assessment

4. Toyota: http://www.toyota.co.jp/en/environment/development/eco-vas/index.html

5. Dassault Systèmes: http://www.3ds.com/company/news-media/press-releases/release/1987/1/?no_cache=1

Glossary

Carbon Footprint

A form of carbon calculation that measures the amount of carbon dioxide equivalent that a country, business, industry, or an individual produces or is responsible for. The footprint calculates the direct and indirect level of CO_2-e emissions. Direct emissions include the burning of fossil fuels for energy and transportation and indirect emissions focus on the whole lifecycle of products from procuring raw materials to waste management.

Design for Compliance

The necessity to design a product to meet environmental standards set by a government.

Eco-design

Incorporates the environmental impact aspects of a product throughout its lifecycle (procurement, manufacture, use, and disposal) as part of the design process and design decisions.

ELV

The European End-of-Life Vehicle (ELV) Directive requires vehicle manufacturers to remove heavy metals such as Lead and Mercury from vehicle components. This directive also dictates ELV material recovery or reuse rates of over 85% of the whole vehicle from 2006 and over 95% of the vehicle from 2015.

Environmental Footprint

The measure of human demand and impact on the environment.

Environmental Sustainability

Continuous improvement of products and processes throughout the product lifecycle in order to lessen the impact of new products and industry on the environment.

Material Compliance

The necessity to use materials in product manufacturing that comply with government regulations.

Product Lifecycle Management (PLM)

PLMs the process of managing the entire product lifecycle through collaboration and the synchronous sharing of all product-related intellectual property (IP) such as design data, engineering changes, and manufacturing specificationsacross an enterprise and its suppliers.

REACH

The European Registration, Evaluation, Authorization of Chemicals (REACH) Regulation applies mainly to chemical manufacturers and consumer packaged goods (CPG) companies who are selling chemicals or "preparations" (blends) of chemicals.

Reuse, Recycle, and Recover

A common phrase in the European Commission directive that pushes the automotive industry to manufacture vehicles with a view to recycling at end of life for the car or truck. This environmentally friendly directive sets clear, quantified targets for the reuse, recycling, and recovery of vehicles and their components.

RoHS

The European Restrictions on the use of certain Hazardous Substances Directive, which applies to those products covered by the WEEE Directive.

WEEE

The Waste Electrical and Electronic Equipment Directive (WEEE) is an environmental waste policy enacted by the European Union. WEEE holds manufacturers responsible for properly disposing of electronic equipment at end of life. Korea, China, Japan, and California have enacted similar legislation.

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Dassault Systèmes, the 3D Experience Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 150,000 customers of all sizes in all industries in more than 80 countries. For more information, visit www.3ds.com.

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