



**HONDA OF AMERICA
MANUFACTURING, INC.:
Lean Manufacturing and Environmental
Management at Honda**

Teaching Note

For more than a decade, WRI's Sustainable Enterprise Program (SEP) has harnessed the power of business to create profitable solutions to environment and development challenges. BELL, a project of SEP, is focused on working with managers and academics to make companies more competitive by approaching social and environmental challenges as unmet market needs that provide business growth opportunities through entrepreneurship, innovation, and organizational change.

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This case study covers the strategic, organizational, and operational decisions involved in one automobile manufacturer's efforts to balance its goals of productivity and high quality with the more elusive goal of environmental responsibility. The case material is based on the real-life experiences of Honda of America's two manufacturing plants in East Liberty and Marysville, Ohio. The case unfolds as the environmental manager in charge of the two plants faces the pending visit of her corporate boss from Tokyo, who has made it clear that environmental issues are of growing importance in Honda's overall direction.

ISO 14000, the new environmental quality standards adopted by some other manufacturers, served as a focusing issue for the environmental manager's thinking, but this issue represented a wider challenge facing the Ohio plants: balancing Honda's core mission of producing the best cars at the lowest cost possible while acting responsibly with regard to the environmental.

Another tension that the environmental manager had to juggle is common in global manufacturing firms today: balancing the influence of Honda's corporate headquarters in Japan with the local and regional context at its U.S. plant sites. The corporate influence included Honda's highly effective version of lean manufacturing, which it and other Japanese manufacturers pioneered. Lean practices had, of course, been largely adopted in Honda's U.S. operations. A corporate policy of localization, however, permitted some lean practices and other manufacturing practices to be modified and adapted to local conditions in the Ohio plants.

The experience of Toyota Motor Manufacturing in Georgetown, Kentucky, provides a contrasting approach to similar constraints. One key difference shaping Toyota's practices is a more centralized strategy for its global manufacturing plants whereby environmental as well as plant manufacturing decisions are more often standardized globally, rather than localized, as is more the case for Honda.

The case study walks through a brief description of lean manufacturing. It is followed by a summary of Honda's environmental policies and management practices. A key point is the strong directive from top management to embrace environmental responsibility, but the directive prescribes no individual plant practices. Then the basic environmental issues facing Honda and other auto manufacturers are summarized. The important point here is that environmental regulations differ widely between Japan and the United States, raising the question of whether the Honda transplants need to adapt their environmental management activities to fit the different context, and if so, how.

The case next discusses how lean manufacturing affects the environmental management and performance of Honda's automobile plants. Detailed examples are taken from real-life experiences at Honda. Three areas are covered: (1) waste reduction, a natural outgrowth of the continuous improvement philosophy (2) high-involvement human resource practices, embodied in activities such as employee development and quality circles and (3) information systems, emphasizing measurement and documented improvement.

Toyota's environmental management practices are outlined to provide a contrasting experience.

The last section summarizes Honda's environmental stakeholder interactions. They illustrate some implications of Honda's recent environmental practices for its relations with regulators, community groups, and so on. The interactions have not all been positive, but Honda has been able to engage in voluntary environmental improvement activities at its Ohio operations that seem both to fit well with its lean philosophy and to satisfy local and regional environmental stakeholders (such as regulators and community groups).

Use of the Case

Overall, the case illustrates the difficulty of balancing competing internal factors (such as a lean manufacturing strategy) and context considerations (such as environmental regulatory pressures) in strategic decisionmaking and organizational design considerations. A central idea to take away from the case is the complexity of managerial decisionmaking when carrying out these balancing acts. Such challenges often resist simple quantification and involve high uncertainty.

Analysis of the Case

A. There are many ways to analyze the case material and approach the decisions facing the environmental manager at Honda. One possible course to guide students through the analysis is provided here. First, students need to determine *the real problem* presented. Two broad responses are possible:

- The problem is how to optimize the trade-off between lean manufacturing and the environment, because both are important, and different approaches have different implications for manufacturing success and for the environment. This would involve an approach to the plant's organization that reflects integration of lean manufacturing and environment;
- The problem is not how to optimize a trade-off because no trade-off should be made. The core business of Honda is making the best cars at least cost. The environment needs to be served, but it should be addressed through an organizational structure and activities that do not interfere with the Honda lean manufacturing practices.

B. If you believe that lean manufacturing and environmental concerns can be considered together (analogous to option (1), the next question in the analysis is *what trade-offs and complementarities exist* between the two.

Areas in which lean production may complement the environment are outlined in the case. This complementarity concept follows the writing of Porter and van der Linde that points out win-win scenarios for business and the environment¹ Additional complementarities and many trade-offs between the two can be envisioned. They can be organized in three areas: waste reduction, human resource practices, and measurement and continuous improvement.

The *waste reduction* mentality, which pervades Honda's operations globally, can have obvious benefits for the environment, such as reducing the use of toxic chemicals that involve expensive waste disposal and recycling more materials that would have become waste. However, the lean waste reduction ethic may hinder some environmental goals. While encouraging efficiency, waste reduction on its own does not provide a sufficient mechanism to meet all social or company environmental goals. Waste reduction can increase environmental performance only up to a point. Given the state of current technology, end-of-pipe controls are eventually needed to reduce effluent emissions further. These controls inherently conflict with the lean mentality, but they are often viewed as essential to meeting U.S. regulators' expectations. In addition, many environmental goals, such as species preservation and maintenance of an ecological balance, cannot be explicitly addressed in a waste reduction framework.

The environmental goal of reducing industrial toxic chemical use is also not served well by lean production strategies. Lean production seeks to reduce the costs of waste, an activity that does not minimize toxicity correspondingly because environmental regulations and markets do not perfectly cost toxic materials.

Human resource practices such as cross-training and quality circles can lead to more creative and pragmatic solutions to environmental issues within the plant because floor-level workers who know the details of plant operations can have input into environmental decisionmaking through these mechanisms. However, intensive employee training and problem-solving circles may not pay off for the environment; many aspects of the environment are so conceptually different from other aspects of manufacturing that employees are used to focusing on. Cost reduction is one example. Employees may have ideas about how to reduce scrap waste, which benefits everyone, but they may be less able to contribute to a discussion of making a sophisticated robot-controlled paint sprayer more efficient.

The use of information systems that focus on *measurement and continuous improvement* allows documentation and tracking of environmental issues within the plant -- effectively making them more concrete and showing the progress that is made. They can also help link environmental benefits to cost reduction and other manufacturing advantages. However, an emphasis on measurement and continuous improvement could be problematic when applied to the environment. Although companies are willing to aim for zero defects under the lean paradigm, they are not yet willing to adopt an analogous goal of zero emissions to the environment. Many doubt that the latter is an appropriate target to set for a plant, given the costs of reaching this goal.

Striving for continuous improvement in manufacturing may interfere with environmental performance. The just-in-time element of lean production, in which parts are continually shipped to the manufacturer in batches just large enough to meet the current demands of the consumer, can have significant implications

¹ Michael Porter and Claas van der Linde, "Green and Competitive: Ending the Stalemate," *Harvard Business Review* (September-October 1995), pp. 120-34.

not only for traffic congestion (owing to increased trucking deliveries) but also for air emissions and energy consumption. Other environmental issues arise from the use of small car-painting blocks. Because the painting guns have to be cleaned with environmentally harmful solvents between colors, the smaller the painting blocks the more solvent is used. (Honda uses large painting blocks, decreasing the need to clean with solvents, but compromising its just-in-time system somewhat.)

C. Discussing these positive and negative interactions between lean production and the environment should help students address the question of: how to *design the organization to maximize complementarities and minimize trade-offs*. There is no right answer to this question. It is analogous to other issues in which core business activities have to be balanced with pressures to behave in a socially responsible manner and the general business context has to be incorporated into strategic thinking about the organization's design and activities.

This organizational design question has several aspects, two of which are considered here. One organizational consideration is the overall level of control afforded local manufacturing plants. Two broad options for *corporate versus local control* are suggested by looking at Honda and Toyota:

- Top-down and centralized management ensures uniform quality and control over policies. This option can easily capitalize on an optimized system of production put into place globally, often leading to economies of scale and lower costs. However, inflexible systems can suffer when facing local constraints and contextual variation.
- Management that is flexible and able to respond to local environmental regulations, input prices, and stakeholder demands is the other option. However, flexibility may lead to greater variation in local production costs, and average costs may be higher across all plants because core production activities are allowed to be disrupted to adapt to local conditions.

A second key aspect of organizational design is *the extent to which environmental activities are integrated* into manufacturing activities. Integration can be achieved through goal-setting policies (such as waste reduction), human resource practices (such as training and quality circles), and the use of information system methods (such as developing metrics for comparing environmental and other performance in areas of manufacturing). Broad options here include:

- An integrated approach, in which environmental activities and staff are blended with mainstream manufacturing and are dispersed across departments in the organization. For example, responsibility for environmental regulations might be assigned as a part-time duty of a team member within ~ plant department or at a lower level. Similarly, input for environmental improvement is formally obtained from all levels of the organization.
- A buffered approach, in which environmental activities and staff are centralized and separated from daily operating activities. For example, a team of regulatory compliance specialists housed in a headquarters building or plant management building would not often interact with staff on the plant floor. Changes to improve environmental performance might more likely originate from this department for consideration by manufacturing staff.

Related Websites

The following websites allow students to explore lean production, automobile manufacturing, environmental aspects of production, and ISO 14000 certification in more detail:

- <http://www.epa.gov/oar/opar/auto/>
- <http://www.rtk.net/>
- http://www.epa.gov/enviro/html/fii/fii_overview.html

Discussion Questions

Lean Production and the Environment

Lean production emphasizes waste reduction. Generally, what are the implications of “lean” for the environment? Is this goal enough to meet all social or corporate environmental goals? How does lean affect issues like species and ecosystem preservation?

Will lean production’s emphasis on waste reduction also lead to a reduction in toxic chemical use? What can the “upstream pollution prevention versus end-of-pipe control” debate contribute to this discussion?

Although companies strive for the goal of zero defects under the lean paradigm, should they adopt an analogous goal in the environmental arena of zero emissions? What alternatives are there?

Environmental Management at Honda

What’s the problem?

What is (are) Honda’s overall challenge(s) in environmental management?

Trade-offs?

If you believe that environmental issues have to be balanced with manufacturing objectives, what are some specific areas where trading off might be required?

Strategy

What strategy should Honda of America (HAM) employ in balancing lean with the constraints of U.S. environmental regulations? How does the time frame affect your answer? Over time, the organization’s external context is likely to change, a factor that may influence the effectiveness of one approach or another.

Organizational design: Honda versus Toyota

What are the benefits and drawbacks of Honda’s approach to organization with respect to the environment? How does it compare with that of Toyota? What different issues arise with vertical or horizontal integration of the environmental staff? What are the possible implications of these organizational structures for meeting environmental regulations?

Honda versus Toyota

How do you see the differences in environmental management between Honda and Toyota affecting their ability to meet regulations?

Select a regulatory agency or other stakeholder (such as the Ohio EPA or the local chapter of Greenpeace) and evaluate HAM’s recent activities and/or policies.

Stakeholders

Would any of your answers to the above questions be different if significant changes occurred in the U.S. regulatory approach? For example, the EPA is considering various ways to revise industry’s environmental regulations. Options include more flexible regulation, industry-specific regulation, and

more emphasis on voluntary programs. How would these changes affect Honda, as opposed to other manufacturers?

Possible assignment

Write Stockley's briefing paper that she planned to present to Suzuki in preparation for his visit. It should address the points outlined in "The Challenge" section.

The briefing paper could take a neutral tone or argue for a particular strategy for Honda's going forward. Either way, reference to both environmental issues and manufacturing/market issues should be made.

Points that could be addressed: What changes, if any, should be made in the organizational design, production system, and plant policies? What directions should be explored further before action is taken? What, if anything, should be done at the corporate level?

Issues to consider: the benefits of lean, HAM's regulatory climate and history, its current organizational structure, the impact of public opinion, and the activities of Honda's main competitor, Toyota.