does the problem affect the environment and the people who inhabit the planet? How can we solve the problem?

He answers these questions and provides much more information. This is a book that should appeal to economists because it discusses and analyzes climate change and global warming from an economic perspective.

Nordhaus makes a strong case for measures to combat and arrest climate change. However, I wish that he had directed his book toward a wider audience: using stronger language, reaching out overtly to the general reader, and choosing a mainstream publisher with a larger promotional budget. Because the stakes are very high in "the climate casino," and there is a need for broad based public support for constructive policy. The future of planet Earth hangs in the balance.

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Worker Leadership: America's Secret Weapon in the Battle for Industrial Competitiveness. FRED STAHL. Cambridge, MA: MIT Press, 2013. Pp. xiii, 245. $29.95.

The author, Fred Stahl, is a former Boeing executive and founding contributor to MIT's Lean Aircraft Initiative (LAI). This initiative was a consortium funded by MIT, government and industry. Its mission was to study industries that have adopted Toyota's methods of organizing and managing manufacturing processes. The knowledge gained was intended to assist Boeing in the design of new factories in order to reduce the cost of airplane production.

Toyota is known for its "lean manufacturing" production methods and just-in-time inventory management system. The objective of lean manufacturing and inventory control is to continually improve worker productivity and minimize inventory costs to increase the profitability of manufacturing automobiles. If workers can increase automobile production with no change in quality and with a minimum auto parts inventory, waste can be eliminated lowering costs and improving profits.

Japanese workers accept an intense work environment that pushes them to their physical limits while impeding their cognitive development. Japan's culture emphasizes harmony, obedience and duty. These cultural

traits foster worker cooperation and internalization of firm goals. In essence, Japanese workers "go along to get along."

Lean manufacturing has a technical and human side. Without understanding the human side as it applies to the American culture, lean manufacturing in the United States is doomed to fail.

The author extensively discusses how lean manufacturing can be incorporated into United States factories. Specifically, he details how Dick Kleine, a general manager for John Deere improved the productivity and profitability of Deere factories. Kleine incorporated the technical aspects of lean manufacturing and just-in-time inventory control with management principles based upon worker leadership.

Worker leadership is a transformational strategy requiring a change in factory culture, "flatter" organizational structure, reorganization of management authority, responsibility and power coupled with redesign of manufacturing operations.

Prior to Kleine's involvement with transforming Deere's factories, Deere followed Frederick Taylor's scientific management principles. Taylor's principles emphasize breaking jobs down into highly specialized tasks as a way to increase labor productivity. Managers' assumed that workers dislike work and followed stick-style supervisory practices to insure workers did not shirk on the job. Douglas McGregor in his 1960 book, *The Human Side of the Enterprise* referred to this management style as Theory X.

Taylor's principles reject workers' knowledge and punish them for taking initiative. Workers at Deere disliked dumbed-down jobs and hated what they perceived to be authoritarian and arbitrary management. An autocratic factory culture intensified the adversarial relationship between unions and management. Factories became battle ground zones of threats, disciplinary action, firings, grievances and wildcat strikes. Labor relations problems led to lower productivity, higher turnover and greater absenteeism resulting in higher labor costs. Further, inadequate job training led to variation in product quality.

Higher labor costs due to poor labor relations were accentuated by Deere's large batch production process. While large batch production of farm implement parts achieves economies of scale, storing parts is costly. Idle parts may rust on the shelf and must be handled and counted increasing the cost of working capital. Also, model and design changes of various farm implements make some stored parts obsolete adding to waste.

The technical and labor relations problems Deere was facing coupled with increased global competition required new approaches to production to improve Deere's competitiveness. Kleine developed a theory of worker productivity with worker leadership being the essential ingredient. While the theory and its assumptions are not new, improving productivity from the shop floor to the entire production enterprise is rare. Managers are often afraid to change unless confronted with significant competitive pressure.

Kleine's ideas developed over several years coming from personal experience working at Deere, visiting other manufacturing plants, attending management seminars and from listening to production workers. From this experience, his theory of worker productivity evolved causing him to change his assumptions about what motivates workers. Kleine came to believe that productive workers are motivated workers who must be given the opportunity to be more productive as a way to reduce cognitive slack. Consistent with Douglas McGregor's Theory Y, Kleine determined that people like to work. In essence, Kleine viewed productivity as an input and job satisfaction an output. Worker leadership requires giving workers more responsibility, authority and power in the production process.

The implementation of Kleine's theory of worker productivity at Deere was a two- step process. First, Kleine needed to change the factory culture then redesign jobs with a more efficient factory lay-out. The changes were designed to enable workers to exercise their natural inclination to improve things.

The primary objective of fostering cultural change was to build trust among key stakeholders at Deere. Trust building in a factory environment involves sending signals to workers that they are respected and valued by the firm. Improved communication among unions, workers and management was also key in helping stakeholders understand Kleine's new vision of production at Deere.

It was important that all parties understood that changes were designed to create "win-win" outcomes for everyone associated with the Deere company. These changes included: keeping plants and restrooms clean, improving cafeteria food, placing name tags in work stations helping Kleine to learn the names of workers, giving workers matching caps and jackets to promote team building, sharing productivity, cost and profit information with union officials, recognition ceremonies for workers' contributions to improved factory performance including hand

written notes to exceptional employees. Salaried managers dressed like production workers and Kleine mailed "vision" booklets to all workers explaining how and why Deere was embarking on such transformational changes in its plants. In addition to the above changes, Deere provided extensive training for all workers, managers and executives on lean manufacturing and just-in-time inventory control methods.

Once Kleine successfully built trust with production workers over time, he redesigned all plant-level jobs. This involved creating work modules that arranged capital equipment more efficiently increasing capital/labor ratios in each module while enlarging job tasks for production workers. Visual training aids were placed in work modules as part of on-the-job training and to remind workers how to perform infrequent tasks.

First-line managers became more like coaches and helped to reduce bottlenecks on the production line. Some managers were reassigned to other jobs while redundant workers and managers were eliminated by natural attrition, retirements and normal departures. Kleine's objective was to bring jobs into balance with employment over time without terminating employees. Validation of trust requires workers to observe the elimination of redundant supervisory jobs for them to believe they actually have more authority, responsibility and power in the production process.

Worker leadership principles generated significant spillover effects at Deere. Worker productivity greatly improved as a result of enlarged and enriched jobs requiring broader skill usage. Higher labor productivity resulted in higher wages and more job satisfaction. Product quality improved measured by lower warranty costs and fewer end-of-line- product defects. Further, higher quality farm implement parts reduced the need to outsource which improved job security. Just-in-time inventory management lowered the cost of working capital. Deere also offered farmers product discounts for purchasing off-season farm equipment reducing seasonal variation in inventories.

Over a period of several years, adapting Kleine's theory of worker productivity to lean manufacturing transformed Deere into a highly productive and profitable enterprise. Cost savings from productivity gains were shared equally between workers and the company. Ideas for product improvement by farmers were incorporated into new models of farm equipment.

Boeing accepted LAI's recommendations based upon Kleine's ideas. It implemented lean manufacturing techniques coupled with worker leadership principles and successfully redesigned some of its aircraft factories.

While lean manufacturing and just-in-time inventory management linked with worker leadership principles has the potential to transform American manufacturing, Stahl indicates that only seven percent of companies are successful with these production methods. Lack of company-wide training and union resistance can be major impediments to transforming the American manufacturing sector.

Stahl's book includes two Appendices that provide a brief but interesting history of manufacturing and more details about Toyota's production philosophy. His book would serve as a good introduction to modern production management. As a practical reader, the book would complement basic undergraduate or graduate texts across a variety of fields including: Supply-Chain Management, Industrial Engineering, Managerial Economics, Strategic Management, Labor and Industrial Relations, Human Resource Management and Organizational Behavior, Change and Development.

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