

“Lean and Green” Manufacturing Program Helps Washington’s Small Manufacturers Reduce Energy Use and Waste

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When Nature’s Path Foods, an organic cereal manufacturer with a facility in Blaine, Wash., decided that being a green company meant going beyond using organic ingredients in its food, it wasn’t sure where to turn to find out how to green its manufacturing processes. Luckily, with the help of a student intern, they discovered a new program that brought together Washington’s Manufacturing Extension Partnership (MEP), Department of Ecology, and several other groups working to improve the operational and environmental performance of area businesses.

“We started off wanting to look at reducing our energy use,” said Jyoti Stephens, the sustainability and stewardship manager at Nature’s Path. “Internally, we had a couple of ideas—solar water heating systems, waste water capture and re-use systems. But the more we dug into it, we discovered there were these great resources available that could help us look for projects that could have an even bigger impact than what we could think of ourselves.”

Those resources were available through the “Lean and Green” program, which began in 2006 as a pilot project funded by the U.S. Environmental Protection Agency. The idea behind Lean and Green was simple: to benefit manufacturers and customers by uniting organizations that help small manufacturers improve their business efficiency with organizations that advise businesses on how to enhance their environmental performance.

“There’s a core group of us who work with industry on energy efficiency who have felt for a long time that we should be coordinating,” said Christine Love, an industrial services program manager at the Washington State University Extension Energy Program, one of the partners in Lean and Green. “In my opinion, our programs are stronger when we come together and leverage our resources. We strengthen our region’s infrastructure that way.”

The original Lean and Green partners were the Washington State Department of Ecology’s Hazardous Waste and Toxics Reduction Program and Washington Manufacturing Services (WMS), an affiliate of the national Manufacturing Extension Partnership. After the pilot phase, additional partners were brought in to strengthen the energy efficiency aspect of the program. They included the Washington State University Extension Energy Program and the University of Washington Industrial Assessment Center, among others.

The term “lean” in the Lean and Green name comes from the lean manufacturing process, a set of tools made famous by Toyota Motor Corporation that is now being used by companies all over the world to identify and eliminate waste (be it wasted time or energy), improve product quality, and reduce production time and costs. Many MEP affiliates offer services in lean manufacturing to small manufacturers in their states, and WMS was no exception. These services are designed to make companies more productive and competitive.

The “green” component came from the EPA’s realization that lean production methods can enhance environmental performance. Hugh O’Neill, a toxics reduction unit manager at the Washington Department of Ecology, explains the link between lean and green this way: “How it all started was that in 2003 the EPA came out with some research that said essentially that lean manufacturing tools are inherently good for the environment, and using those tools can have even more benefit for the environment and energy efficiency if one consciously looks for those kinds of wastes during a lean manufacturing event. So, we [WMS and the Department of Ecology] decided to team up and see what happened.”

During the pilot phase of Lean and Green, the partners worked on efficiency improvements at three manufacturing firms: a cabinet company, a bathware company, and a paint company. “You start on Monday and finish on Friday, and by the end you improve the processes,” explained O’Neill. “The idea is the workers are going to know where the inefficiencies are and are going to be able to come up with the solutions.” According to O’Neill, the companies agree at the outset that there will be no layoffs associated with the program, so none of the efficiency improvements will result in the elimination of workers.

The results of the three pilot projects were impressive. WMS and the Department of Ecology identified numerous significant operational, financial and environmental improvements at all of the companies. A year later, when the partners went back to the companies to assess the lasting impact of the improvements, they found that collectively the three pilot projects saved the companies \$1.6 million annually in operational costs; saved 36,900 gallons of wastewater; reduced the use of hazardous substances by 68,700 pounds; and saved 146,700 therms of natural gas, among other benefits. And this was before energy efficiency experts were incorporated into the process!

Nature’s Path Foods was the first company to enroll in the Lean and Green Program after the pilot projects were deemed a success. Their interest in Lean and Green wasn’t surprising, as food processing is among the most energy-intensive U.S. manufacturing industries. The company was also determined to live up to its founding principal of “leaving the earth better than you found it,” which meant they would need to reduce carbon emissions, waste production, and

energy use. Nature's Path is a Canadian company, but it has a manufacturing facility with 165 employees in Blaine and will soon open another facility in Sussex, Wisconsin.

Nature's Path's Stephens described the Lean and Green process at her company as several different assessments and programs that went on simultaneously—Washington State University did a 3-day energy efficiency audit; the University of Washington brought in a group of students to do measurements around the plant and conduct interviews; there was a “value stream mapping” of waste and energy around one particular product's production cycle done by WMS and the Washington Department of Ecology; a wastewater assessment was carried out by the Department of Ecology's Technical Resources for Engineering Efficiency team; and the company developed a process map, focusing on where the physical areas of waste in the plant were and what the opportunities were to reduce waste and energy. After all of these assessments, Nature's Path was presented with various recommendations they could choose from, each of them with a cost-benefit analysis showing how long it would take for the company to make back in savings the money it would need to invest to achieve various types of improvements.

Although the assessment process was intensive, Stephens called it “a great experience.” O'Neill of the Department of Ecology added, “These are really fun projects to do. People are in it together. There's a big sense of teamwork, a really positive attitude going into these projects. People are very serious about finding opportunities for improvement, but it's really satisfying too to come back and find that something's been accomplished.”

From the value stream mapping exercise, Nature's Path implemented several waste reduction projects, including better managing of airflow on equipment; installing an overhead conveyor system; and adjusting equipment speed to eliminate spill points. With additional help from the Department of Ecology, the company is working on a condensate water recapture system, which should save between \$11,000 and \$48,000 per year in wastewater disposal costs. Nature's Path also decided to pursue a number of the recommendations made by the Washington State University Extension Energy Program and the University of Washington's Industrial Assessment Center. The plant has purchased moisture sensors for one of their extruders, which will improve product quality and energy efficiency. The plant will receive incentive funding from Washington State University for the moisture sensors, and to help purchase equipment for a relative humidity control project, both of which will help the company reduce its natural gas usage. Once these projects are implemented, the expected energy savings to Nature's Path will be close to \$30,000 per year.

Nature's Path was recently recognized as one of Canada's 30 greenest employers of 2009. With the help of the Lean and Green program, they are adding energy-efficient manufacturing to their list of green accomplishments. The Lean and Green program itself is a model for how

Manufacturing Extension Partnership centers can collaborate with state and local environmental and energy efficiency programs to help manufacturers throughout the U.S. reap huge benefits—for their bottom lines and for the environment.