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## Sustainable Manufacturing *Frequently Asked Questions*

### **Q: What are some of the key aspects of Thomas' sustainable manufacturing program?**

A: There are many practices that encompass sustainable manufacturing; some of the most measurable ones are:

- *Zero-Waste-to-Landfill:*  
An industry leader in sustainability efforts, in January 2011, Thomas Built Buses became the first, and remains the only, school bus manufacturer to achieve Zero-Waste-to-Landfill operations.
- *Recycling:*  
Thomas Built recycles an impressive list of materials, and from 2008 to 2010, the company nearly doubled its recycling of wood and nearly tripled its paper and cardboard recycling. Since the 2010 accomplishments, new packaging solutions and process changes have eliminated 12 percent of wood and cardboard from the recycling stream.
- *Energy conservation:*  
Between 2008 and 2011, Thomas Built reduced its energy consumption by 10.1 percent or 360 kW per bus manufactured.
- *Waste-to-Energy:*  
In 2010, Thomas Built recycled 557,878 pounds of waste into energy and produced enough power to sustain 40\* homes for a year. By working with suppliers to reduce packaging waste, Thomas generated only 211,924 pounds for waste-to-energy in 2011, a 60 percent reduction in that recycling stream.
- *Land-to-Energy:*  
In 2010, Thomas Built provided land to house 1,690 Duke Energy owned and operated solar panels. The solar panel field is projected to produce enough power to sustain 41\* average-sized homes.
- *Water conservation:*  
Between 2008 and 2011, Thomas Built reduced its per unit water consumption by 9.8 percent. This equates to a savings of 239 gallons per bus manufactured.
- *Air emissions:*  
New and improved paint booths, reclamation of used solvent and a matured environmental management system have resulted in a 11 percent reduction of volatile organic compounds (VOC) and 22 percent reduction of hazardous air pollutants (HAP) per bus since 2008.

\*Based on average annual use of 13,716 kWh per home.

### **Q: What is Zero-Waste-to-Landfill?**

A: For Thomas Built Buses, Zero-Waste-to-Landfill means that everything received or produced by the company is used, reused, recycled or sold, and nothing is sent to the landfill.

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**Q: What was the impetus of the Zero-Waste-to-Landfill initiative?**

A: The Zero-Waste-to-Landfill goal was initiated by Daimler AG to reduce the carbon footprint of manufacturing facilities under the Daimler umbrella. Thomas Built Buses now stands as the second business in the Daimler Trucks North America family to operate as Zero-Waste-to-Landfill.

**Q: How has Zero-Waste-to-Landfill reduced Thomas' carbon footprint?**

A: In the first year of being Zero-Waste-to-Landfill, Thomas Built Buses' achievement equated to a reduction of 8,595 metric tons of CO<sub>2</sub> (carbon dioxide). It was comparable to removing 1,574 cars from the road, conserving 4,900 barrels of oil or not using 1.2 million gallons of gasoline.

**Q: When was the Zero-Waste-to-Landfill effort started?**

A: Thomas Built Buses began its Zero-Waste-to-Landfill effort in May 2009, but the foundation had already been laid through the company's commitment to go beyond basic compliance with environmental regulations and achievement of ISO 14001 certifications as early as 2004.

All of Thomas Built's manufacturing facilities became ISO 14001 certified in January of 2010, but the Saf-T-Liner<sup>®</sup> C2 plant, chassis plant and Minotour<sup>®</sup> production line had been operating with ISO 14001 certifications since December 2004.

**Q: How did the Zero-Waste-to-Landfill effort evolve?**

A: The effort started in the chassis plant, one of five Thomas Built Buses plants. The chassis plant was chosen because it was a self-contained business led by a cohesive and committed team.

As word of the initiative spread, it sparked a friendly competition among the other plants. The company credits this snowball effect with its success in reaching its Zero-Waste-to-Landfill goal a year ahead of schedule.

Subsequent plants came on board after processes were in place; often in a rolling fashion. The final two plants, which began the process in October 2010 and achieved Zero-Waste-to-Landfill just three months later, moved so quickly that the company had trouble providing adequate containers for recycling – an enviable problem to have.

Thomas Built's business offices are participating in recycling and are included in the company's Zero-Waste-to-Landfill achievement.

**Q: What was the most challenging part of becoming Zero-Waste-to-Landfill?**

A: The major challenges were logistical: finding the best place to put the recycling centers in each plant, and finding a qualified recycler for each waste stream. Some by-products, like cardboard, were easy – in fact, a trash compactor was converted into a cardboard compactor. Other materials, like wood and some plastics, were more problematic. Additionally, there were many miscellaneous recyclables that each needed a home.

**Q: What does Thomas Built Buses recycle?**

A: Thomas Built Buses recycles an extensive list of items, including but not limited to: paint solvent, solvent rags, welding gloves, computer equipment and other e-waste, batteries, fluorescent lamps, cardboard, paper, metal drums, aluminum cans and scrap, copper wire and welding tips, hardened steel, stainless steel, brass, glass, plastic bags, bubble wrap, zip ties, packing bands, trays, caps, bottles and wood.

**Q: What was the initial amount of waste going to the landfill?**

A: In 2006, Thomas Built sent 1,132 pounds of waste to the landfill for every bus manufactured. By January 1, 2011, Thomas Built operations were Zero-Waste-to-Landfill.

**Q: What were some of the surprises along the way to becoming Zero-Waste-to-Landfill?**

A: The company anticipated a certain amount of objection, inherent in any change, that never materialized. Thomas employees jumped right in and were excited. They showed initiative with little guidance. Before long, each and every employee embraced his or her role in the success of this initiative.

**Q: What are some of the internal processes Thomas Built Buses developed?**

A: Using Daimler's Truck Operating System (TOS) continuous improvement program, Thomas employee teams identified the best options for reducing waste and recycling each material, whether reusing cartons for shipping, reclaiming solvent, working with supplier partners to reduce packaging or turning waste into energy.

They also utilized a company created ECO (Environmentally Conscious Operations) checklist, whereby team leaders report in five major environmental impact categories, ensuring, for example, that collection cans are properly labeled and that materials are stored properly. Scorecards are posted in each area weekly.

**Q: What were the most effective tactics for shifting the mind-set of the organization to sustainability?**

A: In addition to the friendly competition among employees, supervisors emphasized positive and enthusiastic introduction of the new processes to each plant. After a celebration with management each time a plant would reach its target, the program would be introduced to the next plant.

Communication throughout all levels was vital. Thomas Built publicized the initiative in the Bus Stop, a weekly employee newsletter, discussed it at TOS huddle meetings and offered daily reinforcement. Team leaders worked individually or in small groups to ensure teams had what they needed.

Peer influence also was key. For example, if something was thrown in the garbage on the shop floor, a fellow employee would immediately show the offending party the correct place to recycle the item.

**Key Milestones of Thomas' Journey to Zero-Waste-to-Landfill**

May 2009	Effort begins at chassis plant
March 2010	Chassis plant achieves Zero-Waste-to-Landfill
May 2010	C2 plant begins its effort
June 2010	Fairfield plant initiates program
October 2010	Plants 1 and 4 begin conversion
December 23, 2010	Last load to landfill
January 4, 2011	Zero-Waste-to-Landfill manufacturing begins

**Q: What is Thomas Built Buses doing to create even stronger sustainable manufacturing practices?**

A: Because the most sustainable manufacturing is one that doesn't produce waste in the first place, Thomas Built Buses is continuing to work to eliminate waste before it needs to be recycled. The company will continue to review and fine-tune its Zero-Waste-to-Landfill commitment and will seek to deepen its sustainable manufacturing practices. Opportunities include:

- working with purchasers to help focus on eco-friendly suppliers,
- making design calibrations that impact material quantities,
- and continuing to utilize DURT's (Daimler Utilities Reduction Teams) to identify ways to reduce resource consumption through more efficient operations.

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