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Company Background

Bosch is a multinational engineering and electronics company headquartered in Gerlingen, Germany, with over 125 locations worldwide. Bosch Automotive Service Solutions in Owatonna, MN, is one of the only sites in the US that manufactures tools required to service vehicles. With over 38,000 unique part designs and a total of 3000 tons of metal processed annually, Bosch is a high-variety, low-quantity manufacturer that has the capability to meet customer orders and specifications for tools for virtually any automobile on the market.



BOSCH
Invented for life

"I had a phenomenal experience working with MnTAP this summer delivering waste reduction solutions! I learned so much about manufacturing processes, corporate environments, and how to lead a project that has real impacts. I would highly recommend the internship to anybody looking to get hands-on experience by applying engineering concepts learned in the classroom to the real world - all while working directly with both MnTAP staff as well as the onsite supervisor." ~ AK

Project Background

Bosch Automotive Service Solutions has seen an increase in solid waste from 1500 tons in 2017 to over 2300 tons in 2019. Bosch Corporate has set a goal for the facility to maintain its waste volume at 2017 amounts even as yearly production increases.

The intern initially focused on opportunities to reduce scrap metal, which accounts for over 50% of solid waste at Bosch (note: scrap metal generated at the facility is recycled, but is still internally counted by Bosch as waste). It became evident that the most impactful changes to reduce metal waste would require significant time investment and capital to re-engineer part designs or create castings, which were outside the scope of the project.

The intern shifted attention to wooden pallet waste, which was one of the facility's top waste category by volume and had high potential for reduction. The intern investigated solutions to improve the storage and organization of pallets as they are used throughout the facility to facilitate a procedure for pallet reuse and reducing disposal volumes.

Incentives To Change

Bosch is strongly committed to its environmental and sustainability values, as well as a company-wide goal to be carbon neutral by 2020. While the Owatonna facility has already successfully diverted much of its waste from going to landfill, a part of the challenge for improving their waste numbers was in the high standards that Bosch has for waste management. Bosch considers outgoing disposal streams that are used for any purpose other than its original design as "waste," even if those streams are recycled. This project demonstrated the value of reuse as a waste management method.

"The projects that were implemented during the internship have already benefited our Bosch site, and have even been shared with other Bosch locations. Additional projects were recommended that will help us realize continued sustainability and cost reduction improvements in the future. We found this partnership with MnTAP to be really valuable for both the intern and the business, and we look forward to working together again."

~ Andrea Peterson, HSE Manager

Solutions

Follow New Pallet Sorting Procedure Using Installed Shelving Rack

One of the main challenges to reducing pallet waste that the intern identified was the lack of a standard procedure for reusing pallets. A waste dive of pallets revealed that a significant portion of the pallets were in reusable condition. The intern also observed that there was no convenient storage space available in this work area for reclaimed pallets.

After discussing the current situation with the intern supervisor and other Bosch staff, it was revealed that a shelving rack from another Bosch site could be brought in. The additional shelving space would solve the storage problem without the need for making an additional purchase. A best location was identified for the shelving unit, which tripled storage capacity for pallets in the area.

The intern also created signage as visual cues to indicate the new process as well as training materials in the form of a presentation and several illustrative diagrams. These were used by the facility to help communicate the new procedure to area managers, maintenance team members, and forklift operators. Ensuring that everyone was aware of the new initiative was essential for facilitating a regular flow of pallets from the newly created reclaim areas back to their main storage areas for reuse.

The impact of this new system was determined to be 25 tons of wood waste and \$9,000 saved in reduced pallet purchasing costs, based on just an 8% reduction in pallet waste in the weeks immediately following implementation.

Contract with New Pallet Supplier

The intern identified a new pallet supplier company that offered superior prices for pallets, while also offering the ability to manage Bosch's current pallet waste stream. The primary advantage of this supplier is their capability

to repair the broken pallets that they receive, rather than shredding the pallets as mulch. Reusing the wood to build new pallets allows for Bosch to reduce its pallet waste numbers by 95%. Working with this new supplier would allow Bosch to divert 245 tons of wood waste from being mulched while saving \$26,400 on purchasing costs.

Optimize Fan Timers

Bosch has approximately 350 24-inch fans in their facility that are used for workstation comfort. The intern noticed that these fans were left on at the end of the shift when no workers were present. The intern measured the power draw for these fans to estimate the total energy usage, and interviewed Bosch associates to learn how frequently they were switched on. It was determined that if a two hour reduction on fans could be achieved, this would amount to approximately 26,200 kWh of energy and \$2,800 saved.



Recommendation	Annual Reduction	Annual Savings	Status
Follow New Pallet Sorting Procedure Using Installed Shelving Rack	25 tons pallets	\$9,000	Implemented
Contract With New Pallet Supplier/Recycler	245 tons pallet and wood waste	\$26,400	Recommended
Optimize Fan Timers	26,200 kWh	\$2,800	Recommended

MnTAP Advisor: Daniel Chang, Associate Engineer