

Waupaca Foundry, Inc

2015 Green Tier Annual Report

Activities for Sustainable Growth

Metalcasters have long been recognized as some of the world's first recyclers. For centuries, foundries have been making new metal objects by re-melting old ones that have become unwanted scrap. While this is a good foundation for a claim that a well run foundry is an environmentally sustainable business, other opportunities exist to improve a foundry's environmental performance.

Waupaca Foundry, Inc. (WFI) has developed primary business goals to achieve sustainable growth between now and 2020. WFI will continue to implement the following actions through 2016:

Goals (2020):

- Facilitate energy use reductions in Waupaca Foundry Operations. Reduce energy use by 25% over the next 10 years, using fiscal 2009 energy use as the baseline (mmBtu/ton of iron shipped).
- Promote alternative processes and maintain state-of-the-art pollution control technologies. Maintain air pollution control systems considered as "best available" by the U.S. Environmental Protection Agency and associated state regulatory agencies for all processes regardless of the original installation date.
- Reduce spent foundry sand generation while promoting offsite reuse/recycling opportunities of remaining spent foundry materials to achieve zero landfill disposal. Reduce spent foundry sand generation by 30% in 10 years (baseline 2010)(tons). Investigate the feasibility of developing alternative uses for remaining foundry byproducts by 2020.
- Facilitate water use reductions in Waupaca Foundry operations. Continue water use optimization efforts to facilitate a company-wide reduction in water use consumption by 80% in 10 years (baseline 2010)(gallons)

2015 Sustainability Goal Progress

Energy Use Reduction

As a representative of an energy intensive industry, Waupaca Foundry has pursued energy use reduction practices and projects to reduce carbon emissions and maintain global competitiveness. Since 2004, significant energy use reduction activities have included heat recovery for building /hot water heating, energy efficient lighting retrofits, and the widespread use of premium high efficiency motors.

Waupaca Foundry was recognized as an energy use reduction leader as a recipient of Wisconsin's 2009 Governor's Award for Environmental Excellence at its Plant One facility in Waupaca, Wisconsin. The recognition was honored for a novel heat recovery system that recovers waste heat from the cupola melting of iron scrap and uses it for heating the facility through the cold Wisconsin winters.

Continuing in this spirit, WFI was among the first companies in the U.S. to volunteer for the U.S. Department of Energy's *Save Energy Now Leader* (later renamed *Better Buildings, Better Plants*) Program. This program seeks a commitment to voluntarily reduce industrial energy intensity by 25% in 10 years. The DOE/Waupaca Foundry agreement continues these efforts with the development of energy use and energy intensity baselines, and the ongoing implementation of an energy management plan to meet the challenging goal.

WFI continued to pursue this primary sustainability goal through 2015 via implementation of energy use reduction projects and the pilot development of a formal energy management program suitable for third party certification (ISO 50001).

As compared to the program's baseline year (2009*), these efforts have facilitated the following companywide energy intensity reductions:

FY2009 = 9,810,076 mmbtu/785,395 tons = 12.49 mmbtu/ton shipped

FY2014 = 15,838,650 mmbtu/1,464,386 tons = 10.82 mmbtu/ton shipped (13.4% cumulative reduction)

FY2015 = 15,251,226 mmbtu/1,458,295 tons = 10.46 mmbtu/ton shipped (16.2% cumulative reduction)

*Under the U.S. Department of Energy's *Better Plants* program, energy metrics are reported under a Fiscal Year reporting format (October 1 thru September 30).

Maintaining Leadership in Pollution Control

Above and beyond any minimum regulatory requirements, WFI's philosophy is to use state of the art pollution control equipment to eliminate potential air pollution, and to seek new ways to continually reduce our air emissions. The air pollution control systems we install at our facilities are considered as "best available" by the U.S. Environmental Protection Agency and the State of Wisconsin for all processes regardless of the original installation date. Nearly a decade before the implementation of the Federal "maximum achievable" control requirements for the iron and steel industry, WFI was proactively retrofitting process air pollution control equipment in advance of the newly defined state of the art.

Of equal importance, filter leak detection instrumentation has been broadly utilized by WFI facilities as an elective technology to achieve superior air pollution control results. Such technology allows WFI to surpass regulatory requirements and create a new industry benchmark.

This leadership philosophy does not hold a numerical annual metric but represents a continuation of the ongoing effort by Waupaca Foundry to promote alternative processes and maintain state of the art pollution control technologies as recognized by U.S. EPA and the State of Wisconsin.

WFI Expands on Past Foundry Sand Recycling Success

WFI has recognized a tremendous opportunity in the potential to reuse spent foundry sands (and slag) for beneficial purposes. Our casting processes require large volumes of sand, which are continually used, reconditioned and reused in the foundry. Sand that can no longer be used in the foundry process can be beneficially reused in lieu of disposal via landfilling. With systems in place to screen metal chunks and debris out of the sand, foundry sand represents a clean, non-toxic product that can be used in a variety of applications and industries. Examples of such uses include geotechnical fill, road construction, agricultural use, cement manufacturing, concrete products and asphalt.

WFI has been recycling foundry sands for over two decades, and has worked in partnerships with state and local agencies (such as the Wisconsin Department of Transportation) to complete projects that would have required substantial quantities of native sand and gravel materials. Using foundry sands and slag for these projects is not just a better use for WFI's byproducts, but has the added benefit of preventing the need to mine native materials elsewhere for the same project. The benefits of foundry sands as a non-toxic resource has become increasingly promoted by state and federal government, along with new research that demonstrates foundry sand's benefits as soil amendments, manufactured topsoils, and highway subbase fill (among many other uses).

WFI's past efforts have resulted in 70% of the byproducts generated from the foundry process now being incorporated into a multitude of local beneficial reuse projects. For 2015, this significant achievement was expanded by the segregation and development of additional reuse materials. Companywide, WFI now provides for offsite reuse 80% of all available foundry sand and cumulatively 69% of all available byproducts including foundry slag.

Continuing efforts through 2015 have provided the following program beneficial reuse improvements (by plant):

Waupaca Foundry - Plant 1 (Waupaca, WI)

2015 = 77% beneficial reuse of foundry byproducts vs. 76% in 2014

Waupaca Foundry - Plant 23 (Waupaca, WI)

2015 = 83% beneficial reuse of foundry byproducts vs. 79% in 2014

Waupaca Foundry - Plant 4 (Marinette, WI)

2015 = 73% beneficial reuse of foundry byproducts vs. 67% in 2014

Eliminating the Need to Generate and Discharge Non-Contact Cooling Water

Historically, operating a successful foundry required water....a lot of water. Water had been consumed in several ways, including contaminated process water requiring treatment as a result of air pollution control activities, and non-contact cooling water used to cool running machinery. As a result of plant

improvements implemented by WFI over the last decade, contaminated process water requiring wastewater treatment and discharge has been completely eliminated from WFI facilities.

Following that accomplishment, WFI initiated the investment and installation of closed loop cooling water systems to eliminate the remaining significant contributor to plant water usage in the form of “once through” non-contact cooling water. Completed systems have demonstrated overwhelming success, with individual plant cooling water demands being cut by 80% or more, and non-contact cooling water discharges reduced to near zero.

Building on this success through 2015, additional closed loop systems are currently being designed and implemented to further reduce water use. As compared to the program’s baseline year (2010), these efforts have facilitated the following companywide water use reductions:

2010 = 3,926,606 m³ / 1,803,192 metric tons melt = 2.178 m³/metric ton melt)

2014 = 3,138,570 m³ / 2,410,185 tons melt = 1.302 m³/ton melt) (40.2% cumulative reduction)

2015 = 2,897,550 m³ / 2,347,590 tons melt = 1.234 m³/ton melt) (43.3% cumulative reduction)