

**Madison Gas and Electric Company
West Campus Cogeneration Facility
Construction Waste Management and Recycling
November, 2003 – June, 2005
FINAL REPORT**



Prepared by

WasteCap Wisconsin, Inc.
2647 N. Stowell Avenue
Milwaukee, WI 53211-4299
Tel. (414) 961-1100 Fax (414) 961-1105
wastecap@wastecapwi.org
www.wastecapwi.org



Introduction

In early November 2003, Jenna Kunde, Executive Director of WasteCap Wisconsin, and Ralph McCall, WasteCap Project Manager, began the process of establishing a construction waste recycling program for the Madison Gas and Electric West Campus Cogeneration Facility (WCCF). At WasteCap's first visit to the site, WasteCap staff encountered resistance from a construction site supervisor who refused entry to the site and did not want to even begin to address the subject of "garbage."

A bit of a rough beginning gave way to a remarkably successful construction waste recycling program on the WCCF project, and one that has had significant influence in encouraging other large commercial construction projects to adopt recycling into their building plans.

In the 20 months following that initial introduction, Madison Gas and Electric Company (MGE) and its construction management team, that included MGE Construct and Alliant Energy Integrated Services, with assistance from WasteCap Wisconsin, implemented an effective and efficient recycling program that achieved a 75.35 percent recycling rate, resulted in a project savings of \$103,651, and converted 2,037.45 tons of material that ordinarily would have gone into area landfills into valuable resources.



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Madison Gas & Electric Company Built the West Campus Cogeneration Facility between Fall 2003 and Summer 2005, achieving a 75% recycling rate, recycling over 2,000 tons of materials and saving over \$103,000 in avoided disposal costs.

Acknowledgements

Such significant recycling achievements can only come from a collaborative team effort. While WasteCap Wisconsin provided the overall plan and oversight of the program, it was the strict commitment and implementation by the construction team that really made the project a success. The prime contractors on the project – AZCO, JF Ahern, J.P. Cullen and Sons, Inc., and Westphall & Company, Inc. – approached their recycling responsibilities with the same professionalism and skill they exhibited in performing the construction work.



Strong partnership was important to the success of the recycling program – between the owner, hauler, site services contractor, recycling manager, contractors, subcontractors, and others

The site services contractor, Holland Construction, provided day-to-day monitoring of recycling activities and did an excellent job of minimizing contamination of the recyclables. Project safety coordinator, ProActive Safety Consultants, provided introductory recycling training for new workers as they came onto the project and regularly displayed a commitment to the program that reinforced positive worker attitudes on the site. In addition, all workers on the site deserve special recognition -- without their willing cooperation the program simply could not have functioned.

Another key component in the success of the program was Pellitteri Waste Systems, Inc. Pellitteri provided the majority of the waste and recycling hauling services to the project and helped solve waste and recycling issues as they arose promptly and efficiently.



WasteCap Wisconsin provided technical assistance, educational assistance, monitored, measured, documented and helped publicize results of construction waste management efforts

Tim Blifernicht from MGE Construct and Ted Wright (on loan to Alliant Energy Integrated Services from Washington Group International) stood out in their dedication to the program. When challenges to the recycling program were presented and authority was needed to see the program through, their leadership and commitment to reaching recycling goals at critical moments ensured the success of the recycling program.

Recycling Program

The Madison Gas and Electric West Campus Cogeneration Facility recycling program included:

1. Requiring all contractors and subcontractors to recycle.
2. Striving to meet an ambitious goal of achieving a 75 percent recycling rate.
3. Identifying wood, metal cardboard and concrete as the primary materials that would be recycled. The program also included provisions for recycling office paper and cardboard along with can and bottle recycling from project eating areas.
4. Educating workers about the recycling program and its goals.
5. Working with the site services contractors and providing additional recycling education for their staff to perform daily monitoring activities.
6. Performing intensive site monitoring of recycling activities early in the project and recycling monitoring throughout the project.
7. Providing site and recycling container signage.
8. Creating worker educational handouts and conducting recycling training of all job site personnel.
9. Documenting recycling performance monthly.
10. Reporting recycling results monthly to project ownership, project management, contractors and workers.
11. Discussing recycling regularly at project planning meetings and holding periodic presentations for job site personnel on recycling.
12. Providing a public information program that was coordinated with WasteCap Wisconsin and the MGE communication office that informed MGE customers and the Madison community about the achievements of the WCCF construction recycling program.



Approximately 135 cubic yards of pallets were recycled at no charge to the project

Innovation

The Madison Gas and Electric West Campus Cogeneration Facility project was responsible for the development of several new techniques that streamlined the recycling process and have since been used successfully on other commercial building projects:

1. A site services contractor coordinated with WasteCap Wisconsin to implement the construction waste recycling program.

2. Six-yard self-tipping containers were used as a way to separate project waste into the various recycling waste streams before transporting the material to the 30-yard project roll offs.
3. WasteCap Wisconsin's recycling education program was coordinated through an overall project safety coordinator. This practice resulted in 1,129 project workers receiving recycling education before they started work on the project.
4. Magnetic signs were used to identify the type of waste that belonged in the transport containers. This allowed the project to reduce the number of transport containers on the site while still having the flexibility to respond appropriately to the types of waste material being generated at a particular time.

Program Accomplishments

1. The WCCF recycling program reached its ambitious goal of recycling 75% of all its construction waste -- with an overall recycling rate of 75.35%. Table 1 below is a breakdown of the materials recycled during this project.
2. 2,037.45 tons of waste was transformed into valuable resources and kept out of area landfills.
3. The WCCF saved or realized project income of \$104,515.83 by recycling.
4. In March 2005, MGE received the Governor's Award for Excellence in Environmental Performance for the WCCF project partly due to their recycling efforts. WasteCap Wisconsin nominated MGE for this prestigious award.
5. Construction waste recycling, along with many other MGE initiatives, presented a positive public image, thereby easing citizen and neighborhood concerns about this large, visible civic improvement project.



610 tons of metal was recycled from the project, providing over \$59,000 in revenue and saving the energy-equivalent of 610 tons of coal.



Over 70 people attended the Nov. 16, 2004 WasteCap Talk & Tour sponsored and hosted by MGE and learned about the project and its recycling leadership

6. MGE and WasteCap sponsored a very successful Talk & Tour in November 2004 that introduced construction waste recycling principles and practices to local and state architects, engineers, construction and utility executives and others.
7. Marketing about 400 tons of high-value H-piling steel separately from the regular project metal recycling program yielded

approximately \$28,000 in additional project income. A similar copper recycling program realized approximately \$10,000 additional income.

Table 1 Detail of Materials Recycled during Construction of Madison Gas and Electric’s West Campus Co-Generation Facility. November, 2003 – June, 2005

Material	Volume (cubic yards)	Weight (tons)	% of Waste Stream (weight)
Metal	2,153	610	22.55%
Wood	2,910	264	9.76%
Concrete	1,329	1,133	41.90%
Cardboard	510	29	1.05%
Plastic	90	2	0.00%
Total Recycled	6,992	2,038	75.35%
Trash	4,535	667	24.65%
Total	11,527	2,704	100%
Recycling Rate	60.66%	75.35%	--

Detail of Avoided Disposal Costs and Revenue during Construction of Madison Gas & Electric’s West Campus Co-Generation Facility

As shown below and in Table 2, the project saved over \$103,000 by recycling. The information below shows the calculation of actual disposal costs to the project vs. what the costs would have been had recycling not occurred. To calculate the cost to the project had recycling not occurred, we used the actual cost that the project was charged for trash by weight and volume and applied it to the weight and volume that was generated on this project. WasteCap gathered the actual costs of disposal and recycling on a monthly basis from project staff and from Pellitteri Waste Systems, who provided the majority of waste and recyclables hauling for this project. Since the project was charged less for recycling collection than trash collection, and in some cases earned revenue for recycling rather than having to pay to have the material hauled, the project achieved significant savings by recycling.

November, 2003 – June, 2005

- 1. Actual cost of trash collection and disposal: \$ 33,287.07
- 2. Actual cost of recyclables collection*: -\$ 19,576.72

* The project had more recycling revenue than expense

- 3. Actual cost of disposal and recycling (1 + 2) \$ 13,710.35
- 4. Cost of disposal if project didn’t recycle* \$117,361.20

to-day monitoring of recycling activities on the site, prevented contamination of materials and worked on site to correct simple problems as they occurred. They also were responsible for calling for dumpster pick up as needed. This effective and efficient working relationship is one significant factor in achieving the high project recycling rate.

2. The 6-yard self-tipping transport containers saved space on a constricted site, allowed waste materials to move efficiently to the lay down area where the large waste containers were located, provided a quality control point to eliminate contamination of the recyclables before it reached the 30-yard waste containers, and improved cleanliness in the area around the dumpsters.
3. Construction waste recycling programs work best when they are put in place very early in a project. Construction activities began at WCCF in October 2003. WasteCap's first site visit was in November. However, the program itself didn't get fully underway until January 2005. Initially, the program struggled with serious contamination issues as WasteCap played catch-up with the education and monitoring functions. However, if preparation and implementation of the recycling program had begun before ground was broken, many of the problems encountered could have been minimized or avoided altogether.
4. Including recycling training in the new worker orientation program contributed greatly to the program's success.
5. Regular reporting of up-to-date recycling results to workers and project management on the site greatly aided in maintaining high levels of performance.
6. Emphasis on the recycling program at regular construction planning meetings is a useful tool for contractor education and to keep awareness of the program high.
7. On large, sensitive, public projects like WCCF, establishing and maintaining consistent communications with the corporate communications office is essential.
8. Construction waste recycling, while a very small part of a construction project, can pay large dividends in terms of project savings and positive community relations.



Consistent education was important. Contractors received recycling education during orientation, and the message was reinforced through signs, at meetings, and by staff

