

Flyash Recycling



Case Study

Project History



This case study is one of four made possible through the Michigan Department of Environmental Quality's (DEQ) Pulp and Paper Pollution Prevention Program, or P5, a voluntary environmental initiative open to all pulp and paper companies in Michigan.

Program objectives were developed by a partnership between DEQ and the Michigan Pulp and Paper Environmental Council (MPPEC) to lessen the industry's environmental impact. Participants identify environmental substances of concern and establish priorities and goals for reduction of their use, generation, discharge, or emission. The technology transfer shared through the experiences of the participants is an integral part of this program. The four case studies are direct products of this technology transfer objective. Biosolids composting, wastewater aeration membranes, and business teamwork case studies have been written in addition to flyash recycling.

Industrial sites such as paper mills, require large amounts of electrical power. Many paper mills have their own power plants to help meet their massive energy requirements. Some of these onsite plants can generate enough energy to power the whole mill; others must purchase some energy from local plants to meet their needs.

One way of creating energy is by burning coal in a boiler system to heat water and produce steam. The steam is used to turn turbines connected to a generator to produce electricity. It can also be used for space heating in the winter and for drying within the production process. Other material, such as waste biosolids

and waste wood products, can also be burned for energy. When anything is burned for heat energy, it also gives off byproduct gasses and a solid residue called ash.

Flyash is a type of ash derived specifically from the combustion of coal. This finely divided residue is transported from the firebox through the boiler by flue gases. The ash can be landfilled or used to make new products. Reusing waste products is a good method of pollution prevention. It not only saves landfill space but also can be an economical benefit to a company.

ABTco, Inc.

The ABTco mill in Alpena, built by Abitibi, began operation in 1957. It produces 400 tons of two-sided hardboard each day. This hardboard is finished into panelling and other wall coverings. The mill employs 265 people full-time. The ABTco powerhouse generates around seven megawatts of power, about half of the amount needed to operate the mill. The remainder is purchased from the local Alpena power plant.

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ABTco's powerhouse contains two coal-fired boilers and one fired by biosolids and reject wood particles. All three boilers burn natural gas to help complete combustion and reduce emissions. The natural gas allows for a more efficient and regulated burn. Each year, ABTco burns approximately 40,000 tons of coal and produces about 12,000 cubic yards of flyash. One hundred percent of the flyash created is trucked to a brick manufacturer in the Detroit area. The flyash is then used as a filler material in the making of bricks. Annually, ABTco saves \$35,000 to \$40,000 over landfilling the ash. According to ABTco Environmental Engineer Mike Connell, "With the steady decrease in landfill space and the corresponding increase in tipping fees, nothing should be landfilled when it can serve another use, such as a raw material."

ABTco started looking for alternatives to landfilling the ash after Alpena County signed a partnership with a local landfill. This would require that all ash be sent to the same landfill, no matter what the cost. In searching for cheaper ways of disposal, the mill found a brick manufacturer looking for cheaper raw materials. This was a perfect match. Once ABTco found a trucking firm to deliver the ash, the project was underway.

Emptying the boiler ash, a 90-minute process, is performed once during each of the three shifts. Vacuum lines move the ash to a silo, where the ash is wetted for easier handling and moved into piles; these are loaded into 40-cubic-yard trucks. ABTco pays the shipping fee.

Georgia-Pacific Corporation

Georgia-Pacific's Kalamazoo Business Unit also recycles its ash. The original Kalamazoo mill was built in 1867 and became part of the Georgia-Pacific family in 1968. It produces 400 tons of coated and uncoated fine printing papers daily from recycled materials (60 percent recycled, half of which is post-consumer). The recycled materials are derived from the de-inking facility onsite. The mill employs 290 people full-time.

This mill recycles both flyash and bottom ash, with flyash composing of more than 90 percent

of the volume. The mill generates most of its own power by burning coal and natural gas. The power boiler creates approximately 15,000 tons of ash each year. The ash is recycled into cement and cement products at one of four approved cement kilns. Each of the cement kilns has passed an environmental review.

The project met some obstacles in its inception. First, the quality of the ash needed to meet raw material specifications at the cement kiln. Therefore, the ash is tested to see that it is within specification and contains no potential contaminants. The ash does contain silica and small amounts of metals. (Some metals can affect the strength and drying qualities of the cement, but the Georgia-Pacific ash does not contain such metals.) This information is shared with the recycling contractor.

Second, the project needed to be economical. Landfilling fees in southwest Michigan have been low the past several years, and the recycling contractor had to take this into account. It does cost less to recycle Georgia-Pacific's ash than to commercially landfill it.

Third, the regularity of service needed to be considered. The coal is being burned constantly at the mill and the ability to store the created ash is limited. The transportation vendor has had to insure regular service in order to keep a continuous operation intact at the mill.

There have been no regulatory or permitting issues affecting the recycling process.

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