Beer Leftovers Cheapen Energy Costs

Technical director Wolfgang Bengel, who works at a German biomass company called the BMP Biomasse Projekt, saw a business opportunity in solving the brewery grain waste headache. He reasoned that the leftover grain could be used to create steam and biogas, which would provide energy for the breweries, cheapening energy costs, as well as the costs of transporting grain to farms.

Bengel claims that he successfully treated the residue from rice and sugar cane in boilers with atmospheric fluidized bed combustion systems to produce energy in China and Thailand. Bengel also believes that a similar process could be developed for the breweries' spent wet grain. Water would first have to be removed from the wet spent grain, then the grain would have to be dried and burned to produce energy. "Beer-making is energy intensive — you boil stuff, use hot water and steam, and then use electric energy for cooling — so if you recover more than 50 percent of your own energy costs from the spent grain that's a big saving," says Bengel.

BMP finally turned to business partner and German biogas plant specialist INNOVAS, which the company had already worked with in China, to help develop the method as a EUREKA project [1]. Germany's BISANZ, which works on engineering projects, was additionally enlisted, as was Slovakian partner Adato, which designs boilers. By chance, BISANZ had been working on a boiler plant for a waste management company that entered bankruptcy with assets being sold. The partners decided to buy the unwanted plant and adapt the equipment to the process of burning spent grain.

Researchers had to add extra cleaning and filtering equipment to the combustion equipment bought. There are extremely high European standards for combustion, and the team had to extend the research timetable as its initial burning tests failed to meet requirements. "We had more than 50 to 60 test periods of burning mixtures of spent grain," according to Bengel.

The partners managed to refine the process in order to meet requirements. They also say that they perfected the anaerobic treatment of brewery wastewater, thereby producing a complete system for breweries to treat their complete waste stream, wet spent grain and wastewater. One of Germany's environmental protection agencies — TÜV Rheinland [2] — certified the burning process as up to standard.

Breweries signing up could become greener breweries, creating their own energy, and cutting down on lorries traveling to and from factories. "Out of 100,000 tons of wet spent grain, you have 2,000 tons or even less of ashes," says Bengel.

Links:
[1] http://www.eureka.be/inaction/viewSuccessStory.do?docid=7724437
[2] http://www.tuv.com/us/en/index.html