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FEATURED COMPANY

MAKING COAL CLEANER: FUEL TECH AT THE FOREFRONT

BY CELINE M. SUAREZ

While the Bush administration is indulging coal-burning utilities that are dragging their feet on anti-pollution technology, Fuel Tech N.V. (NASDAQ:

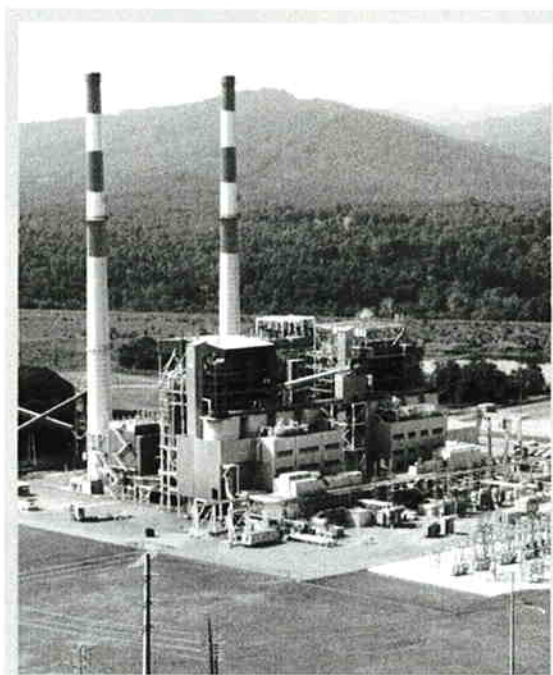


FTEK) is spurring on those forward-looking companies that want to clean up their act.

Headquartered in Stamford, CT, FTEK's three businesses, NOxOUT®, Fuel Chem®, and ACUITIV™, help coal-fired utilities and industrial units meet mandated clean air levels and run more efficiently.

Regulatory-driven business: clearing the air around coal boilers.

According to the US Energy Information Administration (EIA), "Coal is used to generate more than half of all electricity in the United States." To regulate ozone and smog emissions from coal-fired utilities, the US Environmental Protection Agency (EPA) in 1998 finalized the NOx State Implementation Plan (or SIP Call). Under this rule, 22



Fuel Tech's proprietary technologies reduce harmful NOx emissions and improve boiler performance by reducing problematic slag.

states and the District of Columbia must submit plans to address the transport of ground level ozone by reducing emissions of nitrogen oxides (or NOx, a precursor to ozone). The compliance deadline is May 31, 2004, and as unit managers scramble to get emissions in line, Fuel Tech's suite of NOxOUT solutions is leading the charge. This near term growth vehicle should drive company revenues into 2006 as more

Before using Fuel Chem, company boilers were taken off line for seven days twice a year at a cost of \$250,000 per day.

utilities come into compliance with the SIP Call.

With no mandate as to which technology should be adopted by plants, managers are seeking the method that will provide the lowest cost per ton of NOx reduced. Fuel

Tech's NOxOUT products use the common chemical urea (rather than ammonia, a dangerous alternative) to convert nitrogen oxides to water and nitrogen gas (which already makes up 79% of the air we breathe).

ROI-driven emerging business

By contrast, Fuel Tech's emerging business, Fuel Chem, addresses the costly problem of "slagging" in utility and industrial boilers.

Slagging occurs when boiler ash builds up as a result of coal burning. The slag can have a consistency ranging from glassy to cement-like, with chunks sometimes as large as a small car. Besides causing significant structural damage, these "clinkers" can reduce efficiency by preventing effective fire production. Traditionally, coal burners have eliminated slag by blasting the boilers with dynamite or high-pressure washing systems.

To get a better understanding of the problem, WEN contacted two customers using Fuel Chem. Running average sized coal-fired utility boilers, each plant had been losing \$3.5 million annually in revenues, or 70,000 megawatts of lost energy that then needed to be purchased on the open market, due to downtime removing slag. Before using Fuel Chem, company boilers were taken off line for seven days twice a year at a cost of \$250,000 per day.

Rather than dynamite or washing systems, Fuel Chem offers a proprietary Targeted In-Furnace Injection program (TIFI), using the chemical magnesium hydroxide (Mg(OH)₂). In order to determine exactly where the slagging occurs, a proprietary computer-modeling program called ACUITIV is used, which allows engineers to "see" how fluids move and behave inside the boiler. After pinpointing trouble spots, the technicians can inject magnesium hydroxide through small valves—while the boiler runs at its normal rate.

The major cost benefit to customers comes through the elimination of downtime. In some cases, the return on investment (ROI) has been over 200% annually. Indeed, one unit manager stated that his initial \$1.5 million

known to cause significant slag buildup. Using Fuel Chem also helps boiler units meet emissions standards by reducing the amount of oxygen in the boilers. Previously, when slag was a problem, managers would increase the

amount of oxygen in the boilers to help prevent buildup. But this practice exacerbated nitrogen oxide emissions, resulting in greater NO_x control costs. When Fuel Chem is used, less oxygen is required, so nitrogen oxides are reduced. Another plus is that less coal needs to be burned per megawatt produced when the surfaces inside the boiler are clean.

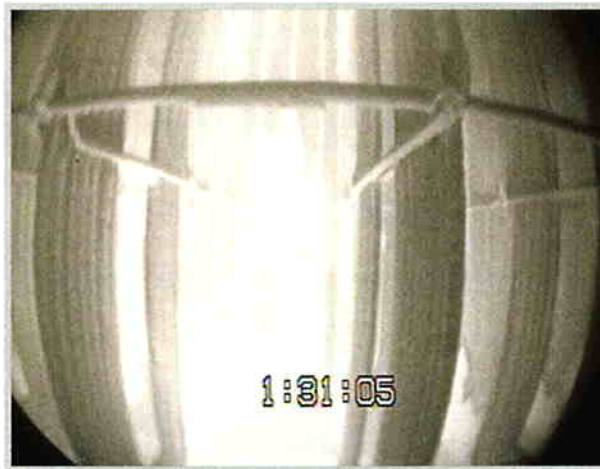
While on the path to renewables, coal must get cleaned up

With Fuel Chem just emerging, boiler unit managers who have been historically reluctant to invest in new technologies are starting to catch wind of the good news. (For example, one of the managers we spoke to reported that his unit running Fuel Chem had been on line for 11 months and 11 days consecutively, with no signs of slowing.)

So far, the company has just a handful of boilers up and running, but interest is high and the pipeline is filling up.

Though it would be environmentally beneficial to have a power system fueled entirely by renew-

ables, its important to remember that in the near term we must still rely on fossil fuels. It is of utmost importance that we do the best we can with existing technologies. In that arena, Fuel Tech is a proven leader. □



The infrared image above shows the inside of a coal-fired boiler prior to treatment with Fuel Chem. The bright, white areas are slag that has built up on the pipes. Below, the same boiler is shown after only a few weeks of Fuel Chem treatment. Note almost no white areas depicting slag in that image.



investment returned \$4 million in just one year.

What's more, Fuel Chem allows boiler managers to purchase cheaper western coal, which because of its high sodium content is