Traders Seek an Edge With High-Tech Snooping

A growing industry uses surveillance and data-crunching technology to supply traders with nonpublic information.

By Michael Rothfeld and Scott Patterson

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Kentucky-based Genscape uses cutting-edge technology to generate its own sneak peek at U.S. oil production ahead of official government reports. WSJ's Michael Rothfeld reports.

CUSHING, Okla.—A helicopter lifted off recently from an airfield in this remote oil town, scudded low across the flat industrial landscape and trained a heat-sensitive camera at the huge storage tanks below.

Its mission: Gather intelligence for Wall Street.

The grainy, infrared reconnaissance images betrayed how much oil was in each tank. That gave Genscape Inc., the company that conducts the flights, a remarkably accurate preview of a market-moving U.S. government report on oil supplies. Traders, hungry to get a jump on the official data, are willing to pay a hefty price for that intelligence.

Genscape is at the vanguard of a growing industry that employs sophisticated surveillance and data-crunching technology to supply traders with nonpublic information about topics including oil supplies, electric-power production, retail traffic and crop yields.

The techniques, which are perfectly legal, represent the latest advance in the longtime Wall Street practice of searching for every possible trading advantage. But the high cost of much of the new information—Genscape's oil-supply report costs $90,000 a year—means that some forms of trading are becoming even more the province of firms with substantial resources.

Genscape Chief Executive Matthew Burkley says such surveillance brings transparency to markets long dominated by energy giants. Although some energy companies aren't happy about the information gathering, he says, "no one can stop us from doing what we do."

Besides monitoring oil supplies in Cushing, Genscape tracks oil shipments leaving European ports using 800 antenna stations, videotapes railcars of crude oil and follows them to their destinations, calculates the amount of coal burned in the U.S. and western Europe, and even studies crop yields using, among other things, satellite imagery.

Other companies are in the game, too. Remote Sensing Metrics LLC in New York has teamed up with satellite companies, such as Colorado-based DigitalGlobe, to analyze sales at major retail chains such as Lowe's and Target by counting cars in parking lots. DigitalGlobe also uses satellites to assess crops and damage levels at disaster sites.

"With new sources of intelligence available, people find new ways to exploit it for an advantage," says Tony Frazier, a DigitalGlobe vice president.

Two images of fields in São Paulo, Brazil, the bottom one taken in infrared. Darker red areas may indicate how recently crops were watered, and generally reflect their health. *RS Metrics (analysis); Astrium (image)*

Andrew Lo, a finance professor at Massachusetts Institute of Technology, says advances in technology can make markets more efficient but also can raise questions of fairness. "It can drive less-informed investors out of the market," he says. "Is the information so valuable, and so hard to get, that only a few people can get it? That creates a barrier to entry."

Cushing is the delivery point for U.S. contracts for the benchmark West Texas Intermediate, a light sweet crude commonly refined into gasoline. When there is a buildup of oil in Cushing it indicates that there is an ample supply, and prices tend to drop on the New York Mercantile Exchange. When stocks are declining in Cushing, prices tend to increase.

Every week, the U.S. Energy Information Administration, or EIA, releases a survey that includes Cushing storage levels. Genscape typically releases its report two days before the EIA survey. Between July and late November, Genscape's reports predicted the direction of every change in the EIA report.

Even EIA officials consult Genscape's report before publishing their own survey. When government officials have spotted big discrepancies, they have double-checked with oil companies that submitted data and occasionally discovered errors.

"We just sort of do it as a sanity check," says Douglas MacIntyre, the agency's director of petroleum and biofuel statistics.

During the recent U.S. government shutdown, when federal officials delayed the release of the EIA report, Genscape was a main source of information for investors about the Cushing supply. Genscape released a free version to the general public on the day the government report would have come out. By then, its paying customers had already had it for several days.

Genscape's clients include banks such as [Goldman Sachs](http://quotes.wsj.com/GS?mod=DNH_S_cq&lc=int_mb_1001) Group Inc., J.P. Morgan Chase & Co. and Deutsche Bank AG, hedge funds including Citadel LLC and large energy-trading outfits such as Trafigura Beheer BV. Surveillance and analysis of the oil, electricity and natural-gas sectors can run Genscape clients more than $300,000 a year.

Genscape tracks the production of electricity by placing sensors on private property near power plants and transmission lines, which monitor the magnetic and electric fields they create. Genscape uses algorithms to estimate electricity production and transmission.

On Aug. 23, 2011, an earthquake struck in central Virginia, knocking out a nuclear-power plant owned by Dominion Resources Inc. at 1:51 p.m. Eastern time.

One minute later, Genscape sent a "plant alert" to clients indicating that power output had taken a hit at Dominion's North Anna Power Station. A team of Morgan Stanley traders in Purchase, N.Y., saw the alert and realized the incident would trigger demand for electricity from other plants to meet the shortfall, causing prices to increase.

The traders scooped up electricity contracts tied to East Coast power demand that would benefit from the move, said a person familiar with the situation. A Morgan Stanley spokesman declined to comment.

Michael Williams, a trader at Black Oak Energy LLC in Princeton, N.J., uses Genscape to watch new wind farms in the Midwest. On windy days, power from those farms threatens to overload older transmission lines. Mr. Williams says the abundance of power typically leads to price reductions near the wind farms the next day.

“ Genscape tracks electricity production by placing sensors near power plants and transmission lines. ”

On Nov. 13, Mr. Williams learned from Genscape that Fowler Ridge, a 600-megawatt wind farm in Indiana, was operating near capacity. Pioneer Prairie, in Iowa, was at its full 300-megawatt capacity.

He says he sold so-called forward contracts tied to the next day's electricity prices in nearby northern Illinois. He bet that 50 megawatts of power per hour would decrease in price in the coming off-peak period, and he was right. The next day, he settled the contracts for much less than he sold them for—in one case, for nearly one-fifth of the price—profiting by more than $15,000.

Genscape has about 4,000 electromagnetic sensors near transmission lines and power plants around the world. It also uses infrared photos of smoke plumes at power plants to determine if they are producing. Plant operators have no say in the matter because Genscape pays private-property owners to place sensors on their land.

At an office in Boston's Back Bay neighborhood, a Genscape team monitors the power grid and weather in different regions. At around noon one day in August, analysts monitoring parts of the Northeast and Midwest saw a red warning light on their computer screens signaling that part of a coal-fired plant in West Virginia had gone down, taking 1,300 megawatts of electricity with it.

Clients saw what was unfolding on their own screens. The price of a megawatt hour of electricity in the spot market run by the local grid operator was $47 at that point. As the grid operators tried to replace the lost power with electricity from elsewhere, the price rose to $60.

The next day, Genscape analysts adjusted their market models and made new predictions. Later, they fielded questions from traders.

"What's driving the real-time strength today?" one energy trader asked in an instant message to a Genscape analyst. The analyst replied that power plants in certain regions weren't producing enough energy to meet demand, which could indicate volatility—and trading opportunities—for near-term prices.

Power traders Sterling Lapinski and Sean O'Leary founded Genscape in Louisville, Ky., in 2000. Mr. Lapinski says traders without access to the information possessed by power companies operated at "a huge disadvantage."

An infrared image of oil tanks in Cushing, Okla., taken from a helicopter by Genscape, is analyzed by software to determine how full they are. The dark horizontal lines indicate how high the oil goes in each. *Genscape*

With wireless technology and the help of engineers, he says, the company devised a system to monitor electrical frequencies coming out of plants and create algorithms to turn the "very noisy" data into useful information.

Genscape received venture-capital funding and expanded to monitoring power generation across the U.S. and in Europe. The Department of Homeland Security was a client after Sept. 11, 2001, Genscape says. The agency sought and got a briefing on Genscape's technology, as did the Central Intelligence Agency. The Homeland Security department and CIA declined to comment.

In 2006, Genscape was bought by a U.S. unit of U.K. media group Daily Mail & General Trust PLC for more than $100 million. The founders remain on Genscape's board. Last year, Mr. Lapinski started another company that provides oil-flow information to traders.

In 2009, Genscape began using helicopters to track oil supplies in Cushing, and in 2011, it started reporting on oil-pipeline flows.

This past summer, Genscape alerted clients to a possible shift in the market for West Texas Intermediate crude. Stockpiles in Cushing had steadily declined since July, driving up the price. Many investors had successfully bet that the U.S. crude would narrow the price gap—called the "spread"—with its more expensive European counterpart. In August, U.S. oil briefly surpassed Europe's oil price.

On Aug. 21 at 12:31 p.m., Genscape told clients in an email that nearly 100 railcars of oil from the Bakken had arrived in Stroud, Okla., and were being unloaded at a pipeline that had been dormant for a year. "Increased power consumption at the Stroud pumping station, indicative of moving the oil through the pipeline to Cushing, was observed at approximately 10:30 a.m.," the alert said.

Traders at Deutsche Bank saw the alert as confirmation that Cushing was becoming a more economical delivery point for suppliers again—and if stocks increased there, U.S. oil prices would drop. So they bet against U.S. oil prices, wagering that the price gap with European oil would widen again, said people familiar with the trading.

Genscape's helicopter flyovers in early October also suggested an impending buildup. Using infrared videos of 373 tanks spread over 25 square miles, analysts had been calculating how much oil was in each tank.

After its helicopter flew south over Centurion Pipeline LP's tanks on Oct. 4, Genscape calculated a gain of 123,000 barrels over the previous three days—a 42% increase. Magellan Midstream Partners LP, one of the larger operators in Cushing, showed a 4.4% increase, to more than 5.5 million barrels.

Genscape calculated that although the overall Cushing oil supply had declined since the prior week, it had increased modestly in the second half of the week—the first such increase in months.

Genscape disclosed the information to clients on Oct. 7 at 9 a.m. Over the next half-hour, trading volume spiked and the gap between U.S. and European oil—about $5.25 a barrel—widened by 8%.

Traders also executed bearish bets that day using another futures contract that compares near-term oil prices with prices a year ahead. That contract declined 3% within 25 minutes of the report's release and 7% on the day, reflecting the oil price drops caused by the buildup in Cushing. West Texas Intermediate, which had surpassed $110 a barrel the month before, closed just over $103.

The shift in the second half of the week wasn't reflected in the U.S. government's report two days later, which recorded a 168,000 barrel decline in Cushing.

Many traders remained bullish on U.S. oil prices. It was a bad bet.

On Oct. 14, with no government-oil report coming that week because of the federal shutdown, Genscape told clients that Cushing stocks had a weekly increase of more than 800,000 barrels, another bearish sign for prices.

The firm made those numbers available to the public three days later. The next week, oil prices fell below $100 a barrel for the first time since July.

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