

Pioneer Natural Resources Natural Gas STAR Case Study Series



PIONEER
NATURAL RESOURCES

Pioneer Natural Resources prides itself on its commitment to the environment and good corporate citizenship. Since joining Natural Gas STAR, Pioneer has reported methane emissions reductions of nearly 2 billion cubic feet (Bcf), which has had both a positive impact on the environment as well as the company's financial bottom line. The strong commitment of Pioneer's staff at all levels—from facility operations to top-level management—has enabled the company to quickly implement a highly successful methane emissions reduction program. At the 2001 Annual Natural Gas STAR Implementation Workshop, EPA recognized Pioneer Natural Resources as a Gas STAR Rookie of the Year for outstanding implementation of its Natural Gas STAR Program within the first year of joining. Building on this early success, Pioneer reported the most emissions reductions of all processing partners in 2002 and was recognized as the Gas STAR Processing Partner of the Year.

PARTNER PROFILE

Pioneer Natural Resources is an independent exploration and production company that was formed in 1997 through the merger of Parker & Parsley Petroleum and MESA, Inc. Although Pioneer has both an international and domestic presence, the majority of the company's oil and gas reserves are located within the United States. Pioneer is the largest operator in the Spraberry oil and gas field in West Texas and one of the largest operators in both the Hugoton gas field in Kansas and the West Panhandle gas field in Texas. Pioneer

operates two gas processing facilities—Fain in the Texas panhandle and Satanta in Kansas—with a combined maximum daily throughput of 360 million cubic feet (MMcf) of gas per day. The majority of the gas processed is extracted from Pioneer's reserves, although the facilities also process small volumes of third-party gas. Pioneer also owns and operates several smaller gas treating plants, including the Ulysses plant in Kansas.



Joining Natural Gas STAR

Pioneer joined Natural Gas STAR as a charter member of the Program's processing sector in 2000. The decision process started one year earlier after Pioneer's president received a letter from EPA announcing the expansion of the Natural Gas STAR Program to the processing sector. Following receipt of this letter, managers in both Pioneer's production and processing business units were asked to weigh the pros and cons of joining Natural Gas STAR and to provide management with a recommendation.

As part of the decision-making process, Pioneer's managers discussed with EPA the responsibilities of partner companies and the benefits of partnership. Representatives from Pioneer also contacted several companies that were already partners in the Program to learn of their experiences. At the same time, the Gas Processors Association (GPA), which had recently announced its endorsement of the Program, encouraged the company to join.

Initially, managers expressed some reservations, including concerns that joining the Program could expose the company to increased risk of audits by EPA. However, after discussions with other partners and review by Pioneer's General Counsel, the managers decided that the benefits outweighed the perceived downside. Pioneer also determined that participation would not result in an additional tracking and recordkeeping burden because the company was already tracking emissions reductions. In the end, both Pioneer's production and processing business units concluded that participation in the Natural Gas STAR Program would benefit the company by:

- Enhancing Pioneer's emissions reduction tracking and recordkeeping system, providing a permanent record of its greenhouse gas emissions reductions, and adding credibility to its accomplishments.
- Formalizing Pioneer's commitment to the environment and enhancing its corporate environmental policy.
- Helping the company identify additional emissions reduction opportunities and reaping the associated financial rewards.

- Allowing Pioneer to exchange technical information with other Gas STAR partners.
- Helping reduce the company's environmental liabilities.
- Demonstrating good corporate citizenship and fostering a positive environmental image.
- Allowing Pioneer to report methane emissions reductions already achieved back to 1990.

Taking these benefits into consideration and realizing that participation would be a positive next step in the company's commitment to environmental initiatives, Pioneer joined the Natural Gas STAR Program.

Getting Started

When Pioneer joined Gas STAR, the company was able to aggressively begin implementation of a comprehensive methane emissions reduction program due to strong support from top-level management. The company began by naming a representative from the engineering group at headquarters as the Natural Gas STAR Implementation Manager coincident with creating new foreman positions at each Pioneer facility. Each foreman was assigned the responsibility of managing environmental issues, including the company's participation in the Natural Gas STAR Program. Operations personnel at Pioneer's processing and treating facilities were introduced to the Gas STAR



Program during regular meetings with head-quarter's engineering staff. Operations personnel were informed of management's commitment to the Program and were encouraged to participate. Corporate management made it clear at the outset that the operations staff would be the front line of Gas STAR implementation, as they are most familiar with the gas processing and treating operations and in the best position to identify emissions reduction

opportunities. According to Henry Galpin, Vice President of Gas Processing, “Once the operations personnel were made aware of the goals that Pioneer was trying to achieve through its participation in Natural Gas STAR, it was very easy to get them on board and actively involved.”



To launch Pioneer’s participation in the Natural Gas STAR Program, the company reviewed past and current methane emissions reduction activities. This information helped the company formulate its implementation plan, prioritize emissions reduction projects, and set realistic goals. At the same time, Pioneer reviewed EPA’s technical support documents—such as

Lessons Learned Studies and PRO fact sheets—to learn more about methane emissions reduction technologies and practices that have been used successfully by other Gas STAR partners. In doing this, Pioneer discovered it was already implementing some of the Gas STAR best management practices (BMPs). Instrument air systems had already been installed at Pioneer’s Fain and Satanta plants, and flash tank separators had been installed on glycol dehydrators at Fain, Satanta, and Ulysses prior to the company joining the Program.

The effort to document, calculate, and report past methane emissions reductions was a large undertaking, but one that was very important to Pioneer. The information gathered allowed the company to permanently record its efforts to improve environmental performance prior to joining Gas STAR and allowed the company to determine the effectiveness and cost savings associated with methane emissions reduction activities. This activity, in turn, helped motivate operations staff and enhanced employee participation in Gas STAR. This data collection effort also allowed Pioneer to build on the established lines of communication between the engineering and operations departments and helped the company set up an efficient and streamlined Gas STAR tracking system that is still in use today.

Implementing the Program

Natural Gas STAR goals have quickly become an important part of the corporate environment at Pioneer, and the Program is integrated into everyday operations at all of its facilities. By centralizing management of the program through the engineering staff at the headquarters office in Irving, Texas, Pioneer has been successful in improving both communication across the organization and the efficiency of data collection. Pioneer’s headquarters office maintains direct contact with facility operators on a daily basis. As a result, Pioneer has developed a streamlined system for tracking the progress and results of its methane emissions reduction projects. Process data, including information relevant to Gas STAR, are collected daily by facility operators and submitted to the engineering staff. The engineering staff performs the appropriate calculations to determine the methane emissions reductions associated with projects. This streamlined, continuous data tracking system allows for a constant collection of methane emissions reduction data that can easily be aggregated for inclusion in Pioneer’s annual Gas STAR report.

Employees from all levels of the company are invited to participate in Natural Gas STAR, and many employees attend the Program’s technology transfer workshops and meetings throughout the year. Operations staff are con-

tinually encouraged to identify additional emissions reduction opportunities that

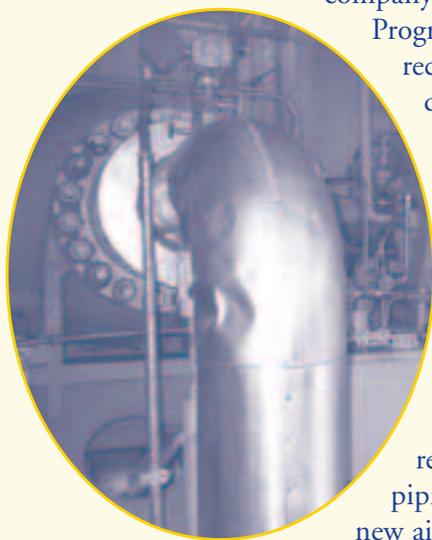


can be implemented at Pioneer’s facilities. In addition, management demonstrates its support by attending Gas STAR workshops and meetings with operations and engineering staff and by publicizing Gas STAR achievements within the company on its Intranet.

Process engineer James Meier, who is responsible for collecting Gas STAR data from processing and treating facilities, believes that “open

communication among all parties involved has been a key factor in the success of Pioneer's Natural Gas STAR Program."

An example of how Pioneer relies on cooperation and communication between all staff to reduce methane emissions was evident during a recent methane emissions reduction project at Pioneer's Fain processing plant. The idea to convert compressor start-ups from natural gas to compressed air originated with the operations staff at Fain. The concept was then forwarded to process engineers at headquarters to investigate the feasibility of implementation and the associated economics for presentation to management. Because senior-level staff at Pioneer recognize the importance of the



company's Gas STAR Program, the project received almost immediate approval despite an initial capital expenditure of approximately \$225,000. Capital costs included installation of a stationary electric air compressor, an air receiver tank, and piping between the new air compressor and the reciprocating and centrifu-

gal compressors located throughout the plant. Pioneer estimates that replacing natural gas with compressed air for start-ups will reduce methane emissions at the Fain plant by approximately 6.5 MMcf per year. The project was so well received that Pioneer plans to convert compressors from starting gas to starting air at the company's Satanta processing plant.

In addition to involving personnel at all levels, Pioneer's environmental efforts have become more formalized. Although there is no specific reward system for proposing new methane emissions reduction projects, environmental performance is part of some employees' job requirements and factors into yearly performance reviews. This level of integration makes all employees aware of the importance of the company's environmental programs, such as its commitment to Gas STAR, and enables them to contribute to a successful methane emissions reduction program as part of their daily job requirements. Pioneer's management also recently issued

a corporate environmental policy that formally solidifies Pioneer's long-standing commitment to reducing the company's environmental footprint, which in turn, helps bolster employees' commitment to the company's Gas STAR Program.

Employing Innovative Technologies and Practices

From the outset of Pioneer's participation in the Natural Gas STAR Program, the company placed a high priority on identifying and implementing innovative technologies and practices to reduce methane emissions. Because of its familiarity with the facilities, Pioneer's operations staff regularly submit ideas for new emissions reduction projects to engineering. These ideas are then explored by both operations and engineering staff and subsequently passed up to management. Potential projects are discussed at regular meetings where engineering presents management with the project details along with cost/benefit information. Because management recognizes the importance of methane emissions reduction projects, these projects typically receive approval.

Pioneer has reported various methane emissions reduction activities in annual Gas STAR reports as Partner Reported Opportunities (PROs). By implementing PROs, Pioneer has been able to enhance its emissions reduction activities by employing its own initiatives tailored to its specific processes and equipment. Through 2002, Pioneer implemented 19 different PROs resulting in more than 1.8 Bcf of methane emissions reductions and saving the company \$5.5 million (at \$3 per million cubic feet). Some of these PROs include:

- **Modifying compressor shutdown logic.** Pioneer modified the shutdown logic for compressors at the Fain and Satanta processing plants to prevent automatic blowdowns when shutdowns occur. The shutdown logic was switched from automatic to manual to allow units to be restarted without blowing down. Not all compressors were modified for safety reasons; however, Pioneer is consulting with compressor manufacturers to determine if additional compressors can be modified.
- **Installing amine unit to reduce NRU derimes.** Pioneer installed amine treating units to remove carbon dioxide from produced gas, and subsequently reduced the number of derimes conducted on the

nitrogen rejection unit (NRU) at the company's Satanta plant. Each time the NRU is shutdown, methane is vented to the atmosphere. Removal of the carbon dioxide from the gas stream reduced the number of NRU shutdowns from as many as four times per year, to less than one.

- **Installing heat tracing on control valves.** Pioneer installed heat tracing at the Fain processing plant to prevent control valves from freezing open and thereby releasing gas to the atmosphere until the valves could be manually closed.
- **Installing gas condensate pipeline.** Pioneer installed a gas condensate pipeline at the Fain plant to eliminate trucking of condensate, which vented vapors during loading operations. This project allowed Pioneer to recover a significant amount of methane that would have otherwise been lost.
- **Piping TEG flash gas to amine flare header.** Pioneer installed piping to route triethylene glycol (TEG) flash gas to the Satanta facility's amine flare. Prior to this project, the flash gas—with a methane content of 90 percent—was vented to the atmosphere.
- **Installing vapor recovery on slug catcher.** Pioneer installed a vapor recovery system on the three-phase separator at the Fain plant. Gas captured by the vapor recovery unit is recycled back into the plant inlet rather than vented.

Maintaining Momentum

Pioneer maintains company support for their Gas STAR Program by continually seeking to implement new methane emissions reduction projects whenever feasible. Although the company has made great strides in a relatively short period of time by implementing numerous methane emissions reduction projects, it is hoping to do more to move beyond the “low-hanging fruit.” Pioneer's engineering staff recognizes that advances in technology are always being made, and it continues to evaluate opportunities for emissions reductions. Pioneer also recognizes that continuing education is critical to generating new project ideas. The company plans to utilize Gas STAR Program information on new technologies and practices implemented by their Gas STAR peers in the processing sector and continue to participate in Gas STAR technology transfer workshops. In addition, Pioneer plans to assist EPA in development of technology transfer documents for the Gas STAR Program based on some of the projects the company has implemented. Pioneer is very proud of its accomplishments and plans to continue being a leader in the Natural Gas STAR Program.

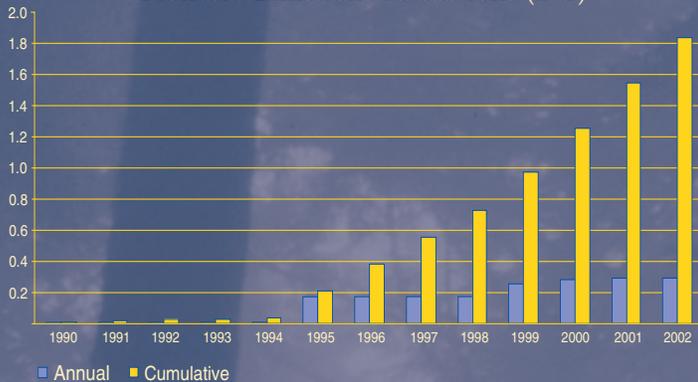
NEW GAS STAR PROJECTS

Pioneer's operations and engineering staff are always thinking about how Gas STAR goals can be incorporated into a plant's routine operations. New methane emissions reduction projects under consideration include:

- **Extending flare header piping to capture compressor blowdowns.** Pioneer is evaluating the feasibility and economics of extending the flare header piping to connect blowdowns on compressors that cannot tolerate logic change. The company is considering routing emissions from those compressors for which the shutdown logic cannot be modified to the onsite flare rather than venting.
- **Converting pneumatic control panels to electric control panels.** Pioneer is also considering converting pneumatic control panels to electric control panels at remote compressor stations. This project is primarily driven by safety issues, but is also expected to reduce methane emissions. The project will include four compressors at two different compressor stations.

PIONEER'S GAS STAR PROGRAM ACHIEVEMENTS

Pioneer's Emissions Reductions (Bcf)



Since joining Natural Gas STAR, Pioneer has reported average methane emissions reductions of more than 288,000 Mcf each year. Through 2002, the company has achieved total reductions of 1.84 Bcf equivalent to \$5.52 million in savings.

“We’re all concerned about the environment and want to do our part. Participation in the Gas STAR Program is a formalized way to show that we are committed to it and we’re not just out there trying to make an easy dollar. Pioneer’s operations staff live in the areas in which they work, so they are very committed to protecting the environment. Through the Gas STAR Program, we can demonstrate our corporate support and commitment, and that helps them feel good about going to work in the morning.”

— Henry Galpin, Vice President of Gas Processing

KEYS TO SUCCESS

Secure Active Management Support. Pioneer has a successful Natural Gas STAR Program because top-level managers are involved. Management has been on board with the Program since the start. Management support ensures that Gas STAR projects regularly receive funding, and the staff has the time and resources to accomplish projects. More often than not, proposals for methane emissions reduction projects receive funding because management understands their importance. Pioneer’s President and CEO, Scott Sheffield, is updated on the company’s Gas STAR achievements during senior management meetings.

Involve Personnel at All Levels. Engineering and management staff at headquarters recognize that the operations staff is the front line of Gas STAR implementation. Operations personnel are the ones that make things happen and come up with many ideas for reducing methane emissions. Not only are operations staff involved in formulating great ideas, but many employees participate by attending Gas STAR technology transfer workshops and the annual Gas STAR implementation workshop—events that both engineering and management staff attend as well. By actively involving all staff, Pioneer builds continuity for its Program, as well as allowing the operations staff to take ownership of these activities.

Maintain Program Momentum. The implementation of methane emissions reduction projects at Pioneer is an ongoing process. Operations and engineering personnel are continually encouraged to find and report additional emissions reduction activities and practices. To keep ideas flowing, open lines of communication are encouraged between all levels of the company—management, engineering, and operations. Regular communication between those groups ensures that methane emissions reductions are at the forefront of everyone’s minds. In addition, Pioneer’s engineering staff conduct regular onsite meetings with the operations staff. During these meetings, the benefits and importance of methane emissions reduction activities are emphasized, which in turn motivates operations staff and ensures that Program momentum is maintained.