

A Hands-on Guide to
Implementing the

Natural Gas STAR Program



Welcome Natural Gas STAR Partners!



Since the U.S. Environmental Protection Agency (EPA) launched the Natural Gas STAR Program in 1993, more than 90 companies—representing natural gas production, processing, transmission, and distribution operations—have voluntarily partnered with EPA to identify and implement cost-effective, gas-saving technologies and management practices. This partnership has provided significant economic and environmental benefits. Thanks to partner efforts, methane emissions have been reduced by more than 220 billion cubic feet as of 2001, with savings estimated at over \$660 billion.

This demonstration of industry ingenuity and commitment has shown that active participation in the Gas STAR Program not only offers quantifiable environmental benefits, but also provides opportunities for partners to improve operational efficiency, maximize revenues, and enhance each company's competitive edge in the natural gas marketplace.

To help you make the most of your participation in the Natural Gas STAR Program, EPA created this Implementation Guide to support your company's efforts to initiate projects that reduce methane emissions and to

guide you through the Program's milestones. Featured within this document is information about the phases of program implementation and descriptions of the tools and services EPA has developed to assist you.

We hope that you find this Implementation Guide an effective tool for implementing the Natural Gas STAR Program in a profitable and efficient manner. We look forward to your success in reducing methane emissions through the Natural Gas STAR Program and proving that cooperative, voluntary partnerships are an effective method for achieving both economic and environmental goals.

Sincerely,

The Natural Gas STAR Program Team

Reducing Methane Emissions

Increasing Efficiency

Maximizing Profits

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Implementation Guide Web Companion

Throughout this guide, you will find many references to the Natural Gas STAR Web site at **www.epa.gov/gasstar**.

This Implementation Guide has a Web companion that provides all the information contained in this document as well as links to templates for download, time-saving data collection and reporting tools, and regularly updated information about technologies, workshops, and program-related news.

Note the icons below to quickly and easily identify content that is most relevant to your particular industry sector.



Production



Processing



Transmission



Distribution

Getting Started

Your company signed a Memorandum of Understanding (MOU)—now what? Before you launch your first Natural Gas STAR project, EPA recommends taking some introductory steps to lay the groundwork for a successful partnership and maximize your gas-saving opportunities.

Develop Internal Program Support

Creating a supportive corporate environment for Natural Gas STAR from the beginning is an important first step. This initial outreach will help your company as you plan and implement your initial emissions reductions activities and expand your program efforts in coming years. Ways in which you can develop and maintain internal program support include:

- **Educating** management and field personnel about the Program and your company's commitment to reducing methane emissions and protecting the environment. Translate the implementation activities into specific economic benefits, and present this information to key decision-makers to justify program investments.
- **Involving** staff at all levels when determining how to implement the Program. Interact with operations and environmental managers as well as others in field and headquarters offices to nurture program buy-in.

■ **Leveraging**

existing corporate infrastructure, such as company environmental committees, to generate awareness of Natural Gas STAR and to implement gas-saving measures.

- **Establishing** communications with corporate media or public relations personnel to ensure program messages



Implementation Tip—Create a Gas STAR Team

Many partners find it useful to establish a Gas STAR Team composed of company employees from different departments. Depending on the size of your organization, you might consider recruiting individuals from management; environment, health, and safety (EH&S); operations; planning; marketing; public relations; and other personnel from company headquarters and field offices. An internal Gas STAR Team can help you educate staff about the Program; identify methane emissions reductions opportunities; provide feedback on the value of methane emissions reductions activities; collect data for compiling and submitting the annual report; and promote milestones and other achievements.

are effectively delivered company-wide and externally to customers and other stakeholders.

- **Developing** routine, ongoing communications mechanisms to keep senior management and key staff informed. Use e-mail listservs, Web forums, newsletters, and regularly scheduled satellite or phone conferences to share information.

Incorporate Natural Gas STAR into Corporate Policy

As you build the foundation for internal program support, identifying where the Natural Gas STAR Program can complement and be integrated with other company initiatives and programs can be helpful. The benefits of participating in Natural Gas STAR are far-reaching and can have a positive impact across multiple company programs and policies. For example, several partners have found that Gas STAR can be incorporated into their ISO 14000 certification plan. Other areas to incorporate the Gas STAR Program include:

- Environmental and operations activities.
- Efficiency improvements and pollution prevention programs.

- Environmental management systems.
- Greenhouse gas (GHG) reduction strategies.
- Public relations campaigns.

Take Advantage of Natural Gas STAR Communications Resources

EPA offers a variety of resources to help you launch your Natural Gas STAR efforts and communicate with key company audiences. Many of the following products are offered online at the Natural Gas STAR Web site, www.epa.gov/gasstar.

- **Natural Gas STAR Program Videos.** EPA has produced two short videos to help implementation managers introduce employees to the Natural Gas STAR Program and the benefits of participation. The videos outline the Program, describe methane emissions reductions technologies and practices, and feature testimonials from program partners.
- **Communications Toolkit.** Use this Web-based toolkit to assist in communicating your program participation. The toolkit contains a variety of creative approaches—or “tools”—designed for easy customization. Each is tai-

Success Story: Columbia Gas & Columbia Gulf Transmission



Upon joining Natural Gas STAR, Columbia formed a steering team to facilitate program management and decision-making. The team consists of employees from key groups (management, field staff, public relations, EH&S, and others) from both transmission companies. Columbia attributes the team with streamlining program decision-making, eliminating multiple levels of review, and playing an instrumental role in identifying methane emissions reductions technologies and practices.

lored for a specific audience, such as shareholders and potential investors, employees, peers, and customers. The tools are available in PDF or HTML files to complement the methods of communicating your program participation.

Implementation Tips— Secure Upper Management Support

Visible management support will invigorate field personnel and result in a stronger Gas STAR Program. Make sure to share your successes with upper management.

Involve Field Personnel

Field staff are instrumental to successful program implementation. Regular meetings between the implementation manager and field staff help ensure that employees are well-informed of existing and new technologies. Good communication pays off in increased revenues and environmental benefits.

The Natural Gas STAR Communications Toolkit can help you gain support throughout your company, inform and motivate employees, enhance your corporate image, and generate positive publicity.

It is organized into three components and can be customized to promote your program participation at all levels of implementation.

■ **Announcing Your Partnership.** Announce your new partnership to peers, shareholders, employees, and the public. Your participation in the Program demonstrates your company's commitment to doing business in an environmentally responsible manner.

The following tools are available as PDF or HTML files:

- *Communications templates:* press release, Web site, company newsletter, stockholder newsletter, and an annual/environmental report.
- *Partner samples:* press releases and newsletters released by partner companies on their work and program participation.

■ **Gaining Support.** Gaining support from management and operations staff is critical in making your STAR Program a success. The Natural Gas STAR Program provides many tools to help you gain commitment from managers and employees for implementation. The following tools are available:

- *Guide to Participation* fact sheet
- Presentations
- Natural Gas STAR program videos
- Journal articles
- Program forms
- Technical support documents
- Natural Gas STAR logos

■ **Publicizing Achievements.** As a Natural Gas STAR partner, take advantage of opportunities to publicize your STAR activities, achievements, and special awards for implementation excellence. Inform others about how your voluntary activities are protecting the environment while increasing efficiency and reducing costs.



You can use the following templates and tools to publicize your company's success in implementing Natural Gas STAR. The following tools are available as PDF or HTML files:

- **Press releases:** accomplishments, awards, new projects.
- **Web site:** feature page, awards page.
- **Company newsletter:** accomplishments, awards.
- **Stockholder newsletter:** accomplishments, awards.
- **Annual/environmental report:** accomplishments.
- **Utility billing insert:** accomplishments, public awareness card.
- **Partner samples** for publicizing achievements.

A template and sample index is also available to help you easily locate PDF or HTML files and to assist you in using the Natural Gas STAR Communications Toolkit to communicate your program participation.

Success Story: Kerr-McGee



Kerr-McGee credits its success implementing Gas STAR to support at all levels: senior management, division level management, and operations and field staff. High-level corporate support early on was instrumental in launching the Program, and the integration of Gas STAR into the existing program structure of the Environmental Excellence Teams has made it sustainable and facilitated all aspects of the Program by providing a mechanism for communication, education, and reporting.

The company uses its Environmental Excellence Team to implement the Program and build internal support. This team meets regularly with field staff to analyze new emissions reductions opportunities, promote methane emissions reductions achievements internally, and educate new employees about the company's partnership with EPA. Kerr-McGee was awarded the Natural Gas STAR Production Partner of the Year award in 2000.

Assessing Methane Emissions Reductions Opportunities

Now that you have established a system to facilitate internal communications and program management decisions, the next step is to assess how you will make Natural Gas STAR work for your company and how you will maximize methane emissions reductions opportunities. In most cases, this is best achieved using a two-step approach:

STEP 1. Review your company's past operations and identify activities that resulted in reduced methane emissions. Developing an inventory of past emissions reductions projects not only helps to identify future opportunities, but it also allows you to document your company's past achievements, and include these reductions in your annual report.

STEP 2. Evaluate the Natural Gas STAR Best Management Practices (BMPs) and Partner Reported Opportunities (PROs), as well as any additional activities your company may have engaged in, for future implementation and for inclusion in your company's implementation plan.

Both of these steps require that you first familiarize yourself with the Natural Gas STAR BMPs and PROs.



Where Do Most Leaks Occur?



Production: Pneumatic devices, glycol dehydrators, and fugitive emissions at the well site.



Processing: Leaks from plants and booster stations, including compressor rod packing, valves, and open-ended lines.



Transmission: Pipeline leaks and blow-downs; leaks and venting at compressor stations, such as valves, compressor seals, and open-ended lines.



Distribution: Leaks at gate stations and metering stations, such as valves and open-ended-lines.

Review Best Management Practices (BMPs)

The Natural Gas STAR Program is built upon a set of proven methane emissions reductions strategies identified by EPA and representatives from the natural gas industry. From gas production to distribution operations, the core BMPs are aimed at reducing leaks and process venting from the largest sources. They are considered to be generally cost-effective and widely applicable across the industry. Together, these technologies and practices represent significant opportunities for the industry to reduce methane emissions and increase product savings.

The following BMPs have been identified for each industry sector:



Production

BMP 1 Identify and Replace High-Bleed Pneumatic Devices

BMP 2 Install Flash Tank Separators on Glycol Dehydrators

BMP 3 Partner Reported Opportunities



Processing

BMP 1 Replace Gas Pneumatics with Instrument Air Systems

BMP 2 Install Flash Tank Separators on Glycol Dehydrators

BMP 3 Implement Directed Inspection and Maintenance (DI&M) at Gas Plants and Booster Stations

BMP 4 Partner Reported Opportunities



Transmission

BMP 1 Implement DI&M Programs at Gate Stations and Surface Facilities*

BMP 2 Identify and Rehabilitate Leaky Distribution Pipe*

BMP 3 Implement DI&M Programs at Compressor Stations**

BMP 4 Use Turbines at Compressor Stations for New Installations or When Retiring Reciprocating Engines**

BMP 5 Identify and Replace High-Bleed Pneumatic Devices**

BMP 6 Partner Reported Opportunities



Distribution

*BMPs typically reported by distribution sector.

**BMPs typically reported by transmission sector.

“We’re convinced that proactive environmental responsibility is good business. Efforts to reduce our methane emissions often improve the operating efficiency of the pipelines, and that leads to financial reward.”

— Steve Wilner, Columbia Gas and Columbia Gulf Transmission

Review Partner Reported Opportunities (PROs)

As part of your company's commitment to the Natural Gas STAR Program, EPA encourages you to identify additional activities and technologies for reducing emissions and improving your operational efficiency. Called PROs, these management practices are a major source of reductions for Natural Gas STAR partners and serve as an opportunity for companies to pursue innovative emissions reductions ideas.

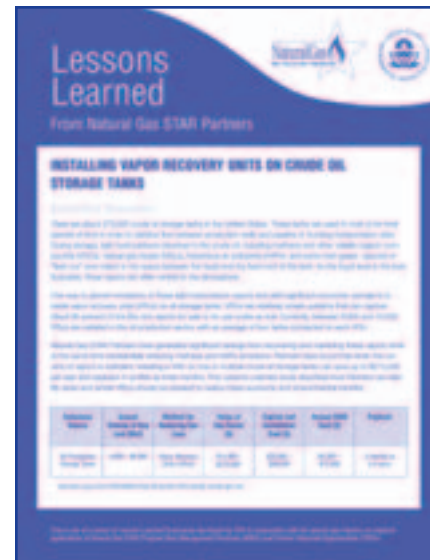
PROs also fuel much of the technology transfer process that occurs within the Program when partners share quantitative and qualitative information about gas-saving practices.

To date, there are more than 50 PROs, and that number grows every year. PROs can be used as a one-time reduction opportunity or as part of your company's long-term emissions reductions strategy. PROs include activities such as installing vapor recovery units, installing plunger lifts, using pipeline pumpdown techniques to lower line pressure before maintenance, and installing smart regulators.

Take Advantage of EPA Technical Resources

Natural Gas STAR has developed a series of technical documents and other tools to help partners evaluate methane mitigation technologies and practices for their own operations. More than a dozen Lessons Learned studies, developed with input from Natural Gas STAR partners, serve as effective guides for implementing BMPs and PROs. These studies contain:

- Descriptions of methane emissions reductions technologies and practices.
- Suggested step-by-step decision process for implementing the practice.



- Summarized cost and benefit information.
- Helpful implementation tips and reference sources for more information.

In addition to the Lessons Learned studies, numerous PROs are described in PRO fact sheets, which offer:

- Brief description of the PRO.
- Discussion of the methane reduction potential.
- Possible frequency of application and life cycle for the PRO.
- Additional information, including potential benefits and costs with a simple calculation of the time to payout.
- Sources for more information.

These fact sheets provide partner companies with information for evaluating the applicability of specific technologies and practices to their operations.

Both the Lessons Learned studies and the PRO fact sheets are available on the Natural Gas STAR Web site. Visit regularly as EPA continually develops new materials.

Utilize EPA's Online BMP/PRO Analysis Tool

Natural Gas STAR's online BMP/PRO Analysis Tool assists partners in performing economic evaluations of BMPs and PROs and in documenting potential emissions reductions savings. This Web-based tool enables the user to conduct a customized site-specific or company-wide evaluation of selected BMPs and/or PROs. These evaluations can then be used in the decision-making process to determine the optimal level of implementation of a specific BMP or PRO.

- The tool prompts users to enter operational information and economic parameters, such as capital cost, operating costs, and current gas price.
- For some calculations, users can select default values for both economic and operational inputs.

Based on this information, the tool performs an economic analysis for the selected BMP or PRO, providing details on the total cost, return on investment, payback period, and net present value. Results are presented in both tabular and graphical formats, including a graphical display of payback period.

The screenshot shows the EPA Natural Gas STAR online BMP/PRO Analysis Tool interface. The header includes the EPA logo and the text "United States Environmental Protection Agency". A sidebar on the left contains navigation links: "Gas STAR Home Page", "Analysis Tool Home Page", "Set economic variable defaults", "BMP tools", "PRO tools", "Results Summary", "Economic Formulae", "Questions, Comments or Suggestions". The main content area has a title "To evaluate this practice for your situation, fill in the values below and click 'Calculate Results'." Below this are three sections: "NATURAL GAS DEHYDRATOR VALUES" with inputs for "TEG circulation rate (gal/hr)" (a text box), "Do you use an 'energy exchange' pump at your lean TEG circulation pump (vs. an electric pump)?" (radio buttons for "Yes" and "No", with "No" selected), and "Market price of the recovered natural gas liquids (\$/bbl)" (a text box with "15.50" entered). The second section is "CALCULATE CAPITAL AND O&M COST ESTIMATES" with a button "Click to calculate estimates for capital equipment costs and O&M costs." and a "Calculate" button. The third section is "CAPITAL EQUIPMENT AND O&M COSTS" with a text box "Enter your own values for the capital equipment listed below or accept the estimates."

“The [EPA Natural Gas STAR] Program’s wealth of information about emissions reductions tactics eliminated time spent exploring and testing new solutions.”

— Mike Milliet, ChevronTexaco

Success Story: Keyspan Energy Delivery



Keyspan field employees are encouraged to identify “quick-hit” opportunities and are expected to contribute to the company’s participation in Natural Gas STAR by informing the internal STAR team when a potential reduction opportunity is discovered. Managers and facility workers then examine the opportunity, determine its feasibility, and implement the new practice where appropriate.

Developing an Implementation Plan

After determining the BMPs and PROs that are appropriate and cost-effective for your company, the next step is to draft and submit an implementation plan.

Review the Core Elements of the Implementation Plan

An implementation plan summarizes how your company intends to incorporate the Gas STAR Program into your operations over a 3- to 5-year period. Overall, the implementation plan should:

- **Conduct an inventory** of past emissions reductions activities. Accounting for historical reductions will create a permanent record of your company's methane emis-



sions reductions efforts and help identify future opportunities. Creating an emissions reductions inventory will:

- Help quantify the environmental and economic benefits of historical activities—great for proving value to management.
- Help identify company best practices, which may be applicable to other facilities.
- Help identify facilities that have the most room for improvement.
- Create a permanent, documented record of past achievements in methane reduction.

Success Story: Ocean Energy



Upon joining the Natural Gas STAR Program, Ocean Energy conducted a thorough review of its operations, dating back to 1990, to identify historical emissions reductions. This process was instrumental in helping the company plan its future activities.

- **Identify** BMPs, PROs, and other planned emissions reductions activities that match your company's environmental and economic objectives.
- **Outline** the planned scope of implementation, noting installations or facilities to be included and an anticipated implementation schedule.
- **Submit** your plan using the template form provided by EPA or devise your own format.

Your implementation plan represents your company's intentions at the time of submission and is not binding. At any time, you may revise it to adjust for changing business conditions or corporate organization. All plans are kept confidential by EPA. Visit the Gas STAR Web site to download the implementation plan template or request samples from an EPA Natural Gas STAR program manager.

Determine Your Implementation Approach

To maximize gas savings, EPA encourages you to implement methane emissions reductions practices as

Implementation Tip

Use the online BMP/PRO Analysis Tool to help you decide which cost-effective BMPs and PROs to feature in your implementation plan.

broadly as possible. Gas STAR partners have adopted several different implementation strategies.

- **Integrate with Current Activities.** When conducting regular maintenance or replacement activities, incorporate Gas STAR Program activities and document methane savings. For example, El Paso Natural Gas Company now makes a practice of repairing and documenting leaks as soon as they are identified, rather than waiting for scheduled repair cycles.
- **Develop a Pilot Project.** Pilot projects can take many different forms. Consider identifying specific facilities or sites at which to implement one or more Natural Gas STAR BMPs or PROs. Many partners start their Gas STAR Program with a pilot project,

Success Story: Kerr-McGee



Kerr-McGee's implementation plan highlights three key areas of activity:

1. Identification of BMPs that the company can integrate into all new facilities where practical.
2. Evaluation of the usefulness of the BMPs and PROs at older facilities on a case-by-case basis.
3. Development of inventories of existing facilities to determine and document past methane emissions reductions.

Kerr-McGee pays special attention to BMPs and PROs during new construction efforts, as it is more efficient to implement activities during the design stage than to retrofit later.

Success Story: Unocal Gulf Region USA



Unocal Gulf Region USA initiated a technology-focused pilot project at its Fresh Water Bayou Facility in Louisiana to test the conversion of its natural gas-powered pneumatic instrument system to a compressed air powered system. The success of the project reinforced senior management support of the Natural Gas STAR Program and prompted the company to look for other opportunities to install instrument air systems.

focusing on one or more BMPs on a small scale at select facilities. Pilot projects help partners determine associated costs and savings, timeframes, staffing, and operational requirements of a BMP or PRO before investing in large-scale improvements.

Based on the results from a pilot project, you can determine whether or not those activities make sense for your company to repeat at other facilities and sites. Positive results from a pilot project can also help sell the Program internally.

- **Conduct a Baseline Study.** Conduct a baseline study of a methane emissions reductions technology or practice, and use the results to set performance standards or to create a “rule of thumb” to help determine future activities. For example, Marathon Oil Company conducted an in-depth review of pneumatic controllers as part of the company’s Natural Gas STAR efforts. In addition to measuring the typical pneumatic performance, the study discovered that if an operator could hear or feel the gas escaping from a device, then it was economical to replace it with a low-bleed device. This rule of thumb was adopted company-wide.

- **Submit Your Implementation Plan.** You may choose to submit your plan using a template form provided by EPA or devise your own format.

When Should You Submit Your Implementation Plan to EPA?



Within one year of joining the Program.



Within one year of joining the Program.



Within six months of joining the Program.



Within six months of joining the Program.

Evaluate Your Implementation Plan Periodically

To ensure that you are maximizing the benefits of the BMPs and PROs, EPA encourages you to revisit and revise your implementation plan every three years.

Consider:

- **Redefining** your company's approach and expected level of effort.
- **Re-assessing** potential methane emissions reductions activities. Re-evaluate the applicability of BMPs and PROs to company operations and conduct cost-benefit analyses to determine the profitability of possible activities. EPA's Online Analysis Tool can help.
- **Take advantage of EPA assistance**—Natural Gas STAR service representatives, case studies, workshops, and a frequently updated Web site are all available resources to help you keep your company's implementation strategy current.

Natural Gas STAR Representatives at Your Service

Natural Gas STAR service representatives are available to assist you in planning your company's participation and implementation strategies, and will make a personal site visit if requested. An up-to-date service representative listing is available on the Natural Gas STAR Web site.



Success Story: ChevronTexaco



ChevronTexaco focused its pilot project on a geographic region—its Gulf Coast regional facilities—rather than on a specific technology. The company encouraged operating personnel to develop their own methods for reducing emissions and to share those ideas with the rest of the pilot group.

Reducing Methane Emissions

Up until this point in your partnership with EPA, you have established the internal framework for launching your company's efforts. These activities have included:

- **Creating** a supportive internal environment with active involvement from senior management and field staff.
- **Opening** channels of communication to discuss methane emissions reductions technologies and practices.
- **Assessing** BMPs and PROs to identify the best fit with corporate objectives and policies.
- **Developing and submitting** an implementation plan.

Putting your implementation plan into action and reducing methane emissions is the next level of participation in the Natural Gas STAR Program.



Use Natural Gas STAR Tools and Services to Implement BMPs and PROs

As described earlier in this guide, EPA has developed a number of tools to help your company realize the financial and environmental benefits of participating in Gas STAR. Below is a summary of products and services that may help you to effectively manage your program efforts. These materials are available for download at the Natural Gas STAR Web site.

- **Lessons Learned studies.** Revisiting these studies frequently can offer added insights into the implementation of key technologies and practices. The simple, step-by-step decision process format and implementation tips provide valuable information based on the experiences of Natural Gas STAR partner companies.
- **PRO fact sheets.** Periodically review the PRO fact sheets for new ideas and basic information for evaluating the economic feasibility of implementing relevant PROs in your operations. A detailed list of fact sheets is posted online and new PRO fact sheets are added as they become available, including the operating requirements and applicability information.

Success Story: El Paso Natural Gas Company



El Paso Natural Gas Company has taken “Lessons Learned” to a higher level. The company developed environmental training modules and a lessons-learned database to help educate employees and demonstrate successful and unsuccessful activities. The database serves to share cost and benefit information about select environmental initiatives, while the modules provide instruction specific to El Paso Natural Gas.

- **Case studies.** Learn how other partners have implemented Natural Gas STAR. These case studies track a company’s involvement with the Program from the decision to join to the evaluation of BMPs and PROs, to the documentation of results.

Companies including Kerr-McGee, Unocal Gulf Region USA, Columbia Gas and Columbia Gulf Transmission, and KeySpan Energy Delivery (formerly Brooklyn Union Gas) are profiled. EPA adds case studies to the Natural Gas STAR Web site as they become available. Please visit the site for a complete list.

- **Online Analysis Tool.** Check out the online BMP/PRO Analysis Tool to evaluate new technologies and consider whether they are cost-effective to implement at your company.

Do You Have a PRO to Share?

EPA encourages you to identify and implement new PROs. If you discover a new way to reduce methane emissions, please let us know. This fuels the Gas STAR technology transfer process.

Take Advantage of Technology Transfer Opportunities

The Natural Gas STAR Program can be a technical asset in today’s competitive environment. EPA continually assesses emerging technologies and facilitates peer-based exchange of technical and economic information on BMPs and PROs. This technology transfer process is one of the Gas STAR Program’s most important missions.

To ensure that information on emerging technologies and important analyses are shared with partners, EPA offers the following services to assist in the transfer of information:

Information Exchange

- **Technology Transfer Workshops** focus on issues related to reducing emissions from individual industry sectors.
- **Annual Implementation Workshops** provide partners and other interested companies with an opportunity to obtain information about the most current, cost-effective emissions reductions technologies and practices, exchange ideas with other partners, and learn about new Gas STAR Program activities and initiatives. The workshop is typically held in October.

- **Research Support.** Natural Gas STAR has provided funding and other support to the Gas Research Institute, New York State Energy Research Development Authority, and to Southern Research Institute through EPA's Environmental Technology Verification program.

“The Natural Gas STAR Program showed us how to do things that we were already doing a little bit better. It showed us what some partners were doing, some of the equipment they were using, rather than what we had used in the past. And, it showed us how we could take account of our emissions.”

— James Frederick, Unocal Gulf Region USA

Success Story: Gas Technology Institute (GTI)



In 2000, the Natural Gas STAR Program partnered with the Gas Technology Institute (GTI) to investigate natural gas emissions from U.S. gas processing plants. The primary goal of the study was to determine the cost-effectiveness of conducting a directed inspection and maintenance program to reduce emissions at these facilities.

GTI surveyed more than 101,000 individual equipment components at four plants. Major findings included:

- Approximately 2.6 percent of the surveyed components were leaking.
- Vibrational, high-use, or heat-cycle gas service components were the most leak-prone.
- Valves, connectors, compressor seals, and open-ended lines made up almost 90 percent of leaking components.
- 92 percent of leakage and 78 percent of methane emissions could be eliminated through cost-effective measures with a payout of one year or less.
- Repair of these leaks would lead to annual natural gas savings worth nearly \$284,000 per site.
- Repairing only the 10 most cost-effective to repair leaks at each site would reduce gas losses by 35 percent.

Conclusion: Processing plant operators can reduce gas losses significantly while enhancing profits by conducting periodic comprehensive leak detection and repair programs.

Technology Analysis

- **Engineering and economic studies** based on experiences and data voluntarily provided by partner companies.
- **Lessons Learned studies** describe partner experiences in implementing the BMPs and include detailed economic and technical information.
- **Additional PRO fact sheets** describe new methane emissions reductions practices identified by program partners.



Documenting Success

The valuable information that partners provide in their annual reports helps the Program to better understand the sources of methane emissions and opportunities to reduce them.

Each spring, EPA asks that you submit an annual progress report, documenting the methane emissions reductions activities your company has undertaken in the previous calendar year. Reporting is essential because it:

- **Creates** a permanent record of your company's voluntary reductions.
- **Demonstrates** to company management the financial and environmental benefits of participating in Natural Gas STAR.
- **Drives** the technology transfer process.
- **Proves** that voluntary partnerships can be effective at reaching environmental goals.

While your report remains confidential, EPA uses these data to develop technical and economic analyses of emerging technologies and management practices. These analyses are then used in tools like the Lessons Learned studies, PRO fact sheets, or online analysis tools.

Compile Information on Emissions Reductions Accomplishments

As mentioned in the "Getting Started" section of this guide, your field staff or Gas STAR Team can help you collect data and compile your annual report. Typically, you will need to collect the following information for each BMP and PRO implemented:

- Brief description or name of practice.
- Cost summary.
- Methane emissions reductions in million cubic feet, either by direct measurement or calculated estimate. Default values for industry-reviewed methane emissions reductions are also available for many BMPs and PROs.

Implementation Fact

Most implementation managers estimate that they spend approximately 25 to 40 hours per year on Natural Gas STAR Program activities, which includes preparing the annual report.

- Total value of gas saved.
- Expected implementation for next year.
- Any past activities implemented but not previously reported.

EPA encourages you to submit additional comments about any BMPs and/or PROs implemented, describing additional economic, operational, environmental, or safety benefits achieved by implementing the practices. This information is important for developing future PRO fact sheets and Lessons Learned studies.

Streamline Data Collection

Completing your annual report is easier if you plan your information collection ahead of time:

- **Advise** staff of reporting requirements in advance—preferably as soon as you sign your MOU—then continue to document and measure year-round as appropriate.
- **Be specific** about information to be gathered and time your requests to prevent last-minute overload.
- **Store** data electronically in a spreadsheet program or other type of database to allow users to summarize and manipulate data.
- **Couple** reporting measurements with other routine annual surveys when possible.

“Making sure that all individuals responsible for providing data understand what is needed and why is the best way to ensure accurate reporting results. Face-to-face meetings work best.”

— Marilee Doherty, Reliant Energy Minnegasco

Take Advantage of EPA’s Online Tools

Online Reporting Tool—The Annual Report Time-Saver!

The Online Reporting Tool is a Web-based tool that guides users through the reporting process. The tool prompts users to enter company-specific emissions reductions data and then perform various calculations, such as total emissions reductions and the value of the gas saved. Online reporting is password-protected to ensure security of all information. Partners can return to partially completed reports and finish them as time allows. Once the report is complete, partners can print out the final form for their records and submit it electronically to EPA.

Online Data Collection and Management Tool—A Streamlined Data Management System!

The Online Data Collection and Management Tool provides implementation managers with a simple Web-based mechanism to collect information from different facilities across their companies, aggregate these data, analyze the results, and generate and submit an annual report, if desired. The tool:

- **Enables** individuals from different facilities across the company to record project-level emissions reductions information.
- **Provides** for all data entry at the facility level via the Internet using password-protected access.
- **Enables** implementation managers to run summary reports of individual practices as well as company-wide activities.
- **Facilitates** information sharing internally or when submitted to the Natural Gas STAR Program as part of the annual reporting process.

Success Story: Columbia Gas and Columbia Gulf Transmission



According to Columbia Gas and Columbia Gulf Transmission, setting measurable goals and objectives in the planning phase and then following through to maintain and increase momentum is essential. By devising metrics to measure and report reductions and savings, and incorporating measurements into the company's existing centralized reporting systems, Columbia streamlined data collection and will reduce future administrative costs.





Continuing Your Success

Success is an ongoing process. As technological, political, and economic circumstances change, new opportunities for process improvements and environmental protection will arise. Keep in touch with Gas STAR for the latest developments on emissions reductions technologies.

Enhance Your Gas STAR Participation

Natural Gas STAR is an evolving partnership that was built with direct input and guidance from natural gas industry professionals. To maximize your partnership in the Program, here are some ways you can stay actively involved:

- **Exchange** technology and information with other partners.
- **Revisit** BMPs and PROs for new opportunities to increase your company's efficiency.
- **Provide** input and ideas to EPA and endorsing organizations on the direction of the Natural Gas STAR Program.
- **Consider** providing assistance and guidance in developing technical and economic evaluations of new reduction opportunities.

- **Collaborate** with EPA on a case study or journal article highlighting your company's Gas STAR experiences and accomplishments.
- **Visit** Natural Gas STAR's Communications Toolkit online to discover the many ways you can promote your program participation and achievements to employees and customers.
- **Attend** the Annual Natural Gas STAR Implementation Workshop or Regional Technology Transfer Workshops to interact with peers and learn the latest Gas Star developments.

Implementation Tip—Attend Regional Technology Transfer Workshops

Natural Gas STAR conducts a series of Regional Technology Transfer Workshops, focusing on issues related to reducing emissions from individual industry sectors and processing operations. Visit the Natural Gas STAR Web site at www.epa.gov/gasstar for locations, dates, and times.

- **Help** bring new companies into the Program. The more partners that become involved in Gas STAR, the richer the technology transfer opportunities.

“The workshops provide a lot of interaction between companies, with presentations about practices implemented. There are also roundtable discussions where partners can talk back and forth and answer questions or ask them of others.”

— Tom Berringer, Marathon Oil Company

Stay Informed About the Latest Gas STAR Information

EPA strives to provide new information on emerging technologies and practices to partners. Visit the Natural Gas STAR Web site frequently and watch your mail for new program publications and other developments such as:

- **Partner Update.** The Natural Gas STAR *Partner Update* features partnership news, partner profiles, articles about new technologies, and information about industry-related events.
- **Workshops.** Annual and regional workshops provide opportunities for EPA and partners to interact and discuss program innovations.
- **New Technical Materials.** EPA strives to continually develop new documents and products to help partners more efficiently implement the Natural Gas STAR Program. Visit the Gas STAR Web site for updates on new materials.

Earn Public Recognition for Your Voluntary Efforts

EPA recognizes exceptional Natural Gas STAR partners in technical articles and public service announcements placed in trade journals, such as the *Harvard Business Review* and *Oil & Gas Journal*, as well as through its prestigious awards program. The awards, presented at the Annual Implementation Workshop, recognize the achievements of partners who have embraced efficiency and incorporated strategic emissions management into their operations. Companies are evaluated for Partner of the Year Awards based on significant contributions in the areas of technology development, outreach, and program implementation. The Communication Toolkit is also a great resource to help partners promote their achievements by using the templates and samples.



Resources



Need more information about implementing the Natural Gas STAR Program? Visit the Natural Gas STAR Web site at www.epa.gov/gasstar. The following items are available to help you reduce methane emissions:

- Comprehensive BMP and PRO descriptions.
- Case studies.
- Communications Toolkit.
- Information on how to obtain copies of the award-winning Natural Gas STAR videos.
- Lessons Learned studies.
- *Partner Update*.
- Presentations.
- PRO fact sheets.
- Program forms and templates—Memorandum of Understanding, Implementation Plan, and Annual Report.
- STAR service representatives contact information.
- Trade journal articles about Natural Gas STAR or authored by Natural Gas STAR partners.
- Web-based Tools—Online BMP/PRO Analysis Tool, Online Reporting Tool, and the Online Data Collection and Management Tool.



United States
Environmental Protection Agency
Office of Air and Radiation (6202J)
EPA430-F-03-013
www.epa.gov/gasstar
July 2003