



SOURCES OF ADDITIONAL INFORMATION

The following list, while not inclusive, illustrates the broad array of organizations concerned about oil and gas E&P technology and protection of the environment. Also, see Appendix 2, DOE Oil and Gas Programs.

Industry Associations and Professional Societies

American Association of Petroleum Geologists

More than 31,000 members in 115 countries. Established in 1917, its purpose is to foster the spirit of scientific research among its members and to advance the science of geology—particularly as it relates to petroleum, natural gas, other subsurface fluids, and mineral resources. The Division of Environmental Geosciences, formed in 1992, provides members with opportunities to increase their knowledge about the environment and the petroleum industry, including concepts for using geological, geochemical, geophysical, and hydrogeological principles and methodologies to resolve environmental problems. Tulsa, Oklahoma (918) 584-2555. Internet: www.geobyte.com

Association of American State Geologists

Organization of the chief executives of the State geological surveys in 50 States and Puerto Rico. The responsibilities of the various State surveys differ from State to State, depending on the enabling legislation and the traditions under which the survey evolved. Almost all function as a basic information source for their State governments' executive, legislative, and judicial branches. Some have regulatory responsibilities for water, oil and gas, and land reclamation. Web site includes an Earth Science Education Source Book for Teachers and Students, a compendium of earth science education materials and services available from the 50 State Geological Surveys in the United States, Puerto Rico, and the Association of American State Geologists. Internet: <http://www.kgs.ukans.edu/AASG/AASG.html>

American Gas Association

Represents natural gas utilities and pipeline companies. Interests include all technical and operational aspects of the gas industry. Publishes a comprehensive statistical record of gas industry; conducts national standards testing for gas appliances; monitors legislation and regulations. Web site includes extensive information on natural gas. Washington, DC (202) 824-7000. Internet: www.aga.org

American Geologic Institute

Nonprofit federation of 32 geoscientific and professional associations that represent more than 100,000 geologists, geophysicists, and other earth scientists. Founded in 1948, the Institute provides information services to geoscientists, serves as a voice of shared interests in the profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in mankind's use of resources and interaction with the environment. Maintains a Clearinghouse for Earth Science Education with an electronic database for elementary school teachers and secondary school science teachers. Produces directories of geoscience organizations and academic institutions. Its GeoRef database provides access to the geoscience literature of the world. Alexandria, Virginia (703) 379-2480. Internet: www.agiweb.org

American Geophysical Union

International scientific society of more than 35,000 researchers, teachers, and science administrators in more than 115 countries, over 30 percent of whom are outside the U.S. Dedicated to advancing the understanding of the earth and its environment in space and making results available to the public. Washington, DC (202) 462-6900. Internet: www.agu.org

American Petroleum Institute

Represents producers, refiners, marketers, and transporters of oil, natural gas, and products. Provides data and information on industry performance, including an annual report on E&P Environmental Performance. Develops guidelines for E&P environmental operations. STEP program encourages responsible environmental operations. Web site includes extensive education information on topics such as the history of oil, materials for teachers, petroleum products at home, and petroleum museums. Washington, DC (202) 682-8000. Internet: www.api.org

Independent Petroleum Association of America

Represents independent oil and gas producers, land and royalty owners, and others with interests in domestic exploration, development, and production of oil and natural gas. Advocates environmental policy being guided by good science, economics, and reasonable goals. Washington, DC (202) 857-4722. Internet: www.ipaa.org

International Association of Drilling Contractors

Promotes safety, preservation of the environment, and advances in drilling technology. Member companies are involved in oil and gas exploration and production, well servicing, oil field manufacturing, and other rig site services. Houston, Texas (281) 578-7171. Internet: www.iadc.org



SOURCES OF ADDITIONAL INFORMATION

Interstate Natural Gas Association of America

Represents U.S. interstate and Canadian interprovincial natural gas pipeline companies. Promotes technologies to reduce methane emissions through EPA Natural Gas STAR Program. Washington, DC (202) 216-5900. Internet: www.ingaa.org

Natural Gas Supply Association

Organization of major and independent producers of domestic natural gas. Interests include the production, consumption, marketing, and regulation of natural gas. Monitors legislation and regulations. Encourages producers to apply cost-effective methane emission reduction strategies. Maintains a natural gas education site on the Internet. Washington, DC (202) 326-9300. Internet: www.ngsa.org

National Ocean Industries Association

Sole national trade association representing all facets of the domestic offshore petroleum and related industries —producers of crude oil and natural gas, contractors, oil field service companies, and others with an interest in the process of exploring for and producing hydrocarbon energy resources from the Nation's Outer Continental Shelf in an environmentally responsible manner. Washington, DC (202) 347-6900. Internet: www.noia.org

Society of Exploration Geophysicists

Promotes the science and education of exploration geophysicists. Fosters the expert and ethical practice of geophysics in the exploration and development of natural resources, in characterizing the near-surface, and in mitigating earth hazards. More than 15,000 members working in 110 countries. Tulsa, Oklahoma (918) 497-5500. Internet: www.seg.org

Society of Petroleum Engineers

Largest individual-membership organization serving professional engineers, scientists, and managers in E&P segments of the worldwide oil and gas industry. Members include more than 50,000 professionals from oil- and gas-producing regions around the world. Facilitates the collection, dissemination, and exchange of technical information concerning the development of oil and gas resources, subsurface fluid flow, and production of other materials through wellbores for the public benefit. Provides opportunities for interested (and qualified) individuals to maintain and upgrade their individual technical competence in these areas. Web site includes a Virtual Suitcase to explore career opportunities in petroleum engineering. Richardson, Texas (972) 952-9393. Internet: www.spe.org

Colleges and Universities

Numerous colleges and universities, including historic black colleges and universities, offer educational courses and degrees in geology, petroleum engineering, and other fields related to oil and gas and the environment. Listings are relatively easy to find via professional organization Web sites or various Internet search engines. Representative of such institutions are:

Louisiana State University

Learn about petroleum engineering, the jobs of drilling, production, and reservoir engineers, and well log analysts on the Craft and Hawkins Department of Petroleum Engineering Web site: www.pete.lsu.edu

New Mexico Institute of Mining and Technology (New Mexico Tech)

Founded in 1889 to advance the geological sciences and mineral industries in New Mexico. Throughout its century-long history, Tech has maintained a tradition of excellence in geoscience. Earth and Environmental Science Department, Socorro, New Mexico (505) 835-5635. Internet: www.ees.nmt.edu

University of Oklahoma

The School of Petroleum and Geological Engineering, rated among the top three petroleum engineering programs in the world, has almost 4,000 alumni, including top executives in Fortune 500 companies. Norman, Oklahoma (405) 325-2921 or (800) 522-0772, ext. 2921. Internet: www.ou.edu/engineering/peteng

The Sarkeys Energy Center includes seven interdisciplinary institutes and a research program encompassing oil and gas exploration, production, utilization, and policy and environmental concerns, involving faculty from the colleges of Geosciences, Arts and Sciences, Law, Business, and Engineering. Norman, Oklahoma (405) 325-3821. Internet: www.ou.edu/sec

Research and Technology Organizations

Gas Research Institute

Research arm of the Nation's gas supply and transportation industry. Its mission is to discover, develop, and deploy technologies and information that measurably benefit gas customers and the industry. Evaluates and transfers information about gas resources and technologies, including E&P environmental technology. Chicago, Illinois (773) 399-8100. Internet: www.gri.org



SOURCES OF ADDITIONAL INFORMATION

International Centre for Gas Technology Information

International forum on gas technology serving senior executives and technical and marketing professionals' information needs. Transfers information on gas technologies to ensure that global gas market needs are met efficiently. Arlington, Virginia (703) 526-7810. Internet: <http://www.gtion.org/>

Institute of Gas Technology

Independent, not-for-profit center for energy and environmental research, development, education, and information. Performs sponsored and in-house research, development, and demonstration. Provides educational programs and services. Disseminates scientific and technical information in four areas: energy utilization; energy supply; environmental protection and remediation; and natural gas transmission, distribution, and operations. Des Plaines, Illinois (847) 768-0500. Internet: www.igt.org

Petroleum Technology Transfer Council

National clearinghouse, with 10 regional centers, to identify and transfer E&P technologies to enable domestic oil and gas producers, principally smaller independent oil and gas producers, to reduce costs, improve operating efficiency, increase ultimate recovery, enhance environmental compliance, and add new oil and gas reserves. Funded primarily by DOE oil and natural gas programs with additional funding provided by State governments, industry, universities, State geological surveys, and other sources. Washington, DC (202) 785-2225. Internet: www.pttc.org

Education and Environmental Organizations

Ground Water Protection Council

A nonprofit organization dedicated to the protection of the Nation's groundwater supplies. Its mission is to promote the safest methods and most effective regulations regarding comprehensive groundwater protection and underground injection techniques. Meetings, workshops, seminars, and symposia provide forums, educational resources, open communication, and active participation by members who include local, State, and Federal governments, citizen groups, industry, academia, and other parties interested in responsible protection and management of groundwater resources. Oklahoma City, Oklahoma (405) 516-GWPC. Internet: <http://gwpc.site.net>

Environmental Defense Fund

Nonprofit organization with more than 300,000 members and five regional offices, addressing a broad range of regional, national and international environmental issues. A leading advocate of economic incentives as a new approach to solving environmental problems. Provides environmental information by mail and electronically; participates in environmental education projects; maintains a Member Action Network to influence national environmental policy; works with grassroots groups at the local and regional level in the U.S. and abroad. Efforts include the Alliance for Environmental Innovation, a joint initiative with the Pew Charitable Trust to work with private companies to create environmental change. New York, New York (800) 684-3322. Internet: www.edf.org

National Academy of Sciences

A private, nonprofit society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Under the charter granted to it by Congress in 1863, the Academy has a mandate that requires it to advise the Federal government on scientific and technical matters. The National Research Council, organized in 1916, is the working arm of the National Academy of Sciences and the National Academy of Engineering, carrying out most of the studies done in their names. Most requests for such studies come from government agencies or Congress. Washington, DC (202) 334-2000. Internet: www.nas.edu

National Energy Education Development (NEED) Project

Established by a Congressional Resolution in 1980, and founded on the conviction that an energy-literate public is essential to a coherent and viable energy future. NEED is "Educating for America's Energy Future." Promotes an energy conscious and educated society by creating effective networks of students, educators, business, government, and community leaders to design and deliver objective, multi-sided energy education programs. Herndon, Virginia (703) 471-6263. Internet: www.tipro.com/need or www.energyconnect.com/need

National Fish and Wildlife Foundation

Nonprofit organization, with five regional offices, established by Congress in 1984. Dedicated to promoting conservation and sustainable use of our natural resources through environmental education, natural resource management, habitat protection, ecosystem restoration, and public policy development. Since 1986, has awarded more than 2,550 "challenge" grants using over \$100 million in Federal funds, which have been matched with nonfederal dollars to bring more than \$300 million to conservation projects. Privately funded partnerships include the Shell Marine Habitat Program to support projects to protect and enhance the Gulf of Mexico ecosystem and the Save the Tiger Fund, an international effort with Exxon to assist in the long-term survival of Asia's remaining populations of wild tigers. Washington, DC (202) 857-0166. Internet: www.nfwf.org

Nature Conservancy

Responsible for the protection of more than eight million acres in 50 States and Canada. Preserves habitats, species, and natural communities by buying the lands and waters they need to survive. Manages the resulting preserves with the most sophisticated ecological techniques available. With partner organizations, has preserved millions of acres in Latin America, the Caribbean, the Pacific, and Asia. Owns more than 1,400 preserves—the largest private system of nature sanctuaries in the world. Arlington, Virginia (703) 841-5300. Internet: www.tnc.org



SOURCES OF ADDITIONAL INFORMATION

National Energy Foundation

Nonprofit provider of educational materials and programs related to energy, natural resources, and the environment. Supported by businesses, government agencies, professional associations, and the education community. Salt Lake City, Utah (801) 539-1406. Internet: www.xmission.com/~nef

Oklahoma Energy Resources Board

Nonprofit organization funded by voluntary industry contributions. Restores abandoned oilfield sites and educates public about the Oklahoma oil and gas E&P industry. Encourages efficient use of energy; promotes environmentally sound production methods and technologies; supports research and educational activities. Oklahoma City, Oklahoma (405) 942-5323 or (800) 664-1301. Internet: www.oerb.com

Oil and Gas Museums

From the grassroots perspective, local oil and gas museums offer excellent opportunities to learn about the evolution of oil and gas E&P technology in the United States. For information, explore local Chamber of Commerce, oil and gas industry, and professional organization Web sites such as www.api.org/edu/museums.htm. These museums include:

East Texas Oil Museum at Kilgore College

A tribute to the independent oil producers and wildcatters, the men and women who dared to dream as they pursued the fruits of free enterprise. Kilgore, Texas (903) 983-8295. Internet: <http://kilgore.cc.tx.us/attr/etom/etom.html>

Healdton Oil Museum

The opening of the Healdton oil field in 1913 set into motion one of Oklahoma's greatest oil booms, establishing southern Oklahoma as a major petroleum-producing area. By 1937, this field, the largest of nine such fields located in Carter County, had produced over 200 million barrels of oil, making it one of the most productive pools in the State. Healdton, Oklahoma (580) 229-0317. Internet: <http://www.brightok.net/chickasaw/ardmore/county/healdoil.html>

International Petroleum Museum and Exposition

Maintains "Mr. Charlie," an authentic offshore drilling rig, for public viewing. A tribute to the pioneering men and women of an industry that developed a culture based on initiative, perseverance, creativity, and hard work. Efforts under way include a Web site "virtual tour." Morgan City, Louisiana (504) 384-3744. Internet: www.rigmuseum.com

Kansas Oil Museum and Hall of Fame

Founded in 1990 to preserve the history of the oil and gas industry. El Dorado, Kansas (316) 321-9333. For more information see: <http://www.greatbend.net/gbcc/tourism/oilmus/>

Offshore Energy Center

Operates a state-of-the-art refurbished jackup facility, the Ocean Star, which is a museum, educational attraction, and working drilling rig all rolled into one. Visitors absorb the day-to-day excitement of offshore drilling and production, marine transportation, environmental protection, construction, pipelining—all experienced through three decks of videos, equipment exhibits, and interactive displays. Galveston, Texas (409) 766-STAR. Internet: www.oceanstaroec.com

Penn-Brad Oil Museum

Preserves the philosophy, the spirit, and the accomplishments of an oil country community; takes visitors back to the early oil boom times of The First Billion Dollar Oil Field. Guided tours are conducted by over 100 oil country veterans who volunteer their time to relate first-hand experiences. Talks are illustrated with colorful display items such as yellow dogs and barkers, headache posts and Samson posts, hurry-up sticks and sucker rods, all used to produce Pennsylvania oil. Bradford, Pennsylvania. Internet: <http://bradford-online.com>

Pennsylvania Historical and Museum Commission Drake Well Museum

Located on the site where Edwin L. Drake drilled the first commercially successful oil well in 1859. Documents the birthplace of the petroleum industry with exhibits, operating field equipment, an extensive photographic collection, and a research library. Titusville, Pennsylvania (814) 827-2797. Internet: www.usachoice.net/drakewell

Texas Energy Museum

Offers a learning experience for both children and adults through multimedia techniques that include rig sounds, motion, light, cinema projection, voice, and photo-mural backgrounds. Exhibits deal with the geology of hydrocarbons and the history of the petroleum industry within a total energy picture. Beaumont, Texas (409) 833-5100.

Spindletop Gladys City Boomtown Museum

A reconstruction of an oil boomtown that appeared almost overnight following the discovery of the Spindletop oil fields in 1901. The site includes a 58-foot granite monument to the Lucas Gusher and is a national historic landmark located on the Lamar University Campus. Beaumont, Texas (409) 835-0823.

Oil and Gas Companies

Corporations are too numerous for a complete listing. Following are three with interesting Web sites:

Chevron

Check out the Exploration Zone for an educational primer about oil production and refining. With simple graphics and nontechnical text, it's great for students and teachers. Internet: www.capitalchevron.com

BP Amoco

Takes a leadership position in addressing climate change and other environmental issues; offers energy educational materials in six languages for teachers and students worldwide as part of its Science Across the World Web site. Internet: www.bpamoco.com and <http://www.bp.com/saw/>

Conoco, Inc.

Conoco's Web site features short on-line movies about some of the industry's newest and most innovative technologies. These videos provide an excellent tool for understanding how advanced oil and gas exploration and production technology is impacting the world and protecting the environment in which we live, both in the United States and around the world. Internet: www.conoco.com/about/glance/index.html



SOURCES OF ADDITIONAL INFORMATION

Other Government Agencies and Offices

Department of the Interior

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and to honor our trust responsibilities to tribes. This mission as related to oil and gas is implemented by several agencies:

Bureau of Land Management, which manages fluid and solid mineral leasing on Federal lands as part of its mission to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations. Washington, DC (202) 452-5125. Internet: www.blm.gov

Minerals Management Service (MMS), which manages the Federal offshore oil and gas leasing program, including Rigs to Reefs and Safety and Environmental Management Plan activities in cooperation with industry. These activities are part of MMS' mission to manage the mineral resources on the Outer Continental Shelf in an environmentally sound and safe manner and to timely collect, verify, and distribute mineral revenues from Federal and Indian lands. Washington, DC (202) 208-3985. Internet: www.mms.gov, MMS Internet KidsPage: www.mms.gov/mmskids

United States Geological Service, which evaluates and classifies onshore oil, natural gas, geothermal resources, and all solid energy and mineral resources, including coal and uranium on Federal lands, as part of its mission to provide the Nation with reliable, impartial information to describe and understand the earth. Reston, Virginia (888) 275-8747. Internet: <http://energy.usgs.gov>

Department of Labor Occupational Safety and Health Administration

Dedicated to saving lives, preventing injuries, and protecting the health of America's workers through regulatory and voluntary programs and partnering with Federal and State agencies to protect more than 100 million working men and women and their 6.5 million employers who are covered by the Occupational Safety and Health Act of 1970. Voluntary Protection Programs recognize outstanding achievements by companies that successfully integrate a comprehensive safety and health program into their total management system. Washington, DC (202) 693-2000 and (202) 693-1999. Internet: www.osha.gov

Department of Transportation Coast Guard

Carries out search-and-rescue missions in and around navigable waters and on the high seas. Enforces Federal laws on the high seas and navigable waters of the United States and its possessions. Conducts marine environmental protection programs; administers boating safety programs; inspects and regulates construction, safety, and equipment of marine vessels, including those for oil and gas E&P. Establishes and maintains a system of navigation aids; carries out domestic icebreaking activities. Washington, DC (202) 267-2229. Internet: <http://www.uscg.mil>

Department of Transportation Office of Pipeline Safety

Issues and enforces Federal regulations for oil, natural gas, petroleum products, and hazardous liquids pipeline safety. Conducts a voluntary program to advance pipeline safety. Washington DC (202) 366-4595. Internet: <http://ops.dot.gov/>

Energy Information Administration

Clearinghouse for statistical information on energy data, including information on natural gas and oil production. Established in 1977, its mission is to develop energy data and analyses that enhance the understanding of energy issues on the part of business, government, and the general public. A KidsPage is under development in cooperation with the National Energy Education Development Project. Washington, DC (202) 586-8800. Internet: www.eia.doe.gov

Environmental Protection Agency

Implements Federal laws designed to promote public health by protecting our Nation's air, water, and soil from harmful pollution. Aims to accomplish its mission by integration of research, monitoring, standard-setting, and enforcement activities. Coordinates and supports research and antipollution activities of State and local governments, private and public groups, individuals, and educational institutions. Washington, DC (202) 260-2090. Internet: www.epa.gov

Agency programs include:

Natural Gas STAR to encourage the natural gas industry to reduce leaks through cost-effective best management practices.

Coalbed Methane Outreach to increase methane recovery at coal mines.

Project XL to allow companies to test alternative approaches that achieve cleaner and cheaper environmental results than would be realized under existing requirements.

Environmental Technology Initiative, an interagency effort supporting more than 250 partnerships and projects throughout the United States to promote improved public health and environmental protection by advancing the development and use of innovative environmental technologies.

Interstate Oil and Gas Compact Commission

An organization of States which promotes conservation and efficient recovery of domestic oil and natural gas resources while protecting health, safety and the environment. Represents the governors of 37 States—30 members and seven associate States—that produce virtually all the domestic oil and natural gas in the United States. Established in 1935, it is among the oldest and largest interstate compacts in the Nation. Oklahoma City, Oklahoma (405) 525-3556. Internet: www.iogcc.oklaosf.state.ok.us

National Governors Association

A bipartisan organization comprising the governors of the 50 States, the commonwealths of the Northern Mariana Islands and Puerto Rico, and the territories of American Samoa, Guam, and the Virgin Islands. Founded in 1908 after the Governors met with President Theodore Roosevelt to discuss conservation issues. Through three standing committees on Economic Development and Commerce, Human Resources, and Natural Resources, the Association's Center for Best Practices, and other activities, the governors identify priority issues and deal collectively with issues of public policy and governance at both the national and State levels. Washington, DC (202) 624-5300. Internet: www.nga.org



SOURCES OF ADDITIONAL INFORMATION

United States Congress

Numerous committees, such as those listed below, have jurisdiction over energy, environment, and science and technology issues and the capability to make national public policy decisions affecting the advancement of oil and gas technology. Washington, DC. More information is available on the Internet: www.senate.gov and www.house.gov

U.S. House of Representatives: Committees on Appropriations, Commerce, Resources, Science, Small Business, Transportation and Infrastructure, and Ways and Means.

U.S. Senate: Committees on Appropriations, Commerce, Science and Transportation, Energy and Natural Resources, Environment and Public Works, Foreign Relations, and Small Business.

On-Line Petroleum Business Information

Numerous Internet sites are maintained by private services. For example:

Oil-Link, a privately owned on-line directory of petroleum-related Internet sites and information, rated #1 by the Dow Jones Business Directory: www.oillink.com

Offshore Technology, a London-based Web site for the offshore oil and gas industry that includes information on current E&P projects and organizations, country-by-country, worldwide: www.offshore-technology.com

Journals and Publications

For more information about the oil and gas industry and advanced oil and gas technologies, talk to your local librarian. The following are just some of the numerous journals and publications on the oil and gas industry.

The American Oil & Gas Reporter

A monthly independent trade magazine on exploration, drilling, and production that also serves as the official publication for 23 oil and gas associations and two biennial oil and gas industry trade shows.

E&P Environment

A biweekly newsletter reporting on environmental issues, technological innovations, and State and Federal regulations affecting oil and gas E&P. Web site links from www.epeonline.com include an Amazing Environmental Organization Web Directory characterized as the Earth's Biggest Environment Search Engine.

Hart's Petroleum Engineer International

A monthly magazine for engineering, management, and operating decision makers engaged in drilling, production, and reservoir engineering worldwide.

Improved Recovery Week

A newsletter published since 1982 on news and developments in worldwide improved and enhanced oil and gas recovery.

Inside Energy/with Federal Lands

A weekly newsletter from McGraw-Hill Companies on Department of Energy programs in energy, science and technology, and nuclear-weapons clean up, and the Department of Interior's management of energy and minerals on Federal lands.

Journal of Petroleum Technology

Official publication of the Society of Petroleum Engineers, with peer-reviewed oilfield management and engineering articles focusing on practical engineering solutions to oilfield problems.

Oil & Gas Journal

A magazine published weekly by PennWell Publishing Co. on technology, industry news, statistics, and special reports and analyses for the petroleum industry. Other publications include Offshore Magazine and Revista Latinoamericana Magazine, published quarterly in Spanish about the petroleum industry in Latin America.

Energy Alert, Natural Gas Week, Oil Daily, Petroleum Intelligence Weekly, World Gas Intelligence

Five of 12 publications from the Energy Intelligence Group that disseminate market, financial, and technology information related to the oil and gas industry.



DEPARTMENT OF ENERGY OIL AND GAS PROGRAMS

A primary mission of the Department of Energy's Office of Fossil Energy is to foster advanced, more efficient, and cleaner fossil energy technologies through research and development programs. Planning and implementation of our Natural Gas and Petroleum Technology Programs reflects the collaboration of DOE staff in the Office of Natural Gas and Petroleum Technology in Washington, DC; at the National Petroleum Technology Office in Tulsa, Oklahoma; and at the Federal Energy Technology Center in Morgantown, West Virginia and Pittsburgh, Pennsylvania.

Our overall goals are to (1) reduce the vulnerability of the United States economy to disruptions in oil supply by stabilizing domestic oil production; (2) increase domestic energy production in an environmentally responsible manner by increasing domestic gas production and recovering oil with less environmental impact; (3) ensure energy system reliability, flexibility, and emergency response capability of oil and gas transportation and storage systems; and (4) develop technologies that expand long-term energy options.

For further information on the *Environmental Benefits of Advanced Oil and Gas Exploration and Production Technology*, contact:

NANCY L. JOHNSON
Director of Planning and Environmental Analysis
Office of Natural Gas and Petroleum Technology
(202) 586-6458; e-mail: nancy.johnson@hq.doe.gov

TRUDY TRANSTRUM
Communications Coordinator
Office of Natural Gas and Petroleum Technology
(202) 586-7253; e-mail: trudy.transtrum@hq.doe.gov

Like any organization, DOE is made up of people—people who care about having a healthy domestic oil and gas industry and a healthy environment. DOE staff are committed to finding real solutions that allow the Nation to benefit from a strong economy and a clean environment. Advanced oil and gas technologies and innovation are part of America's heritage and its future.

We offer our gratitude to the many individuals who made this report possible. Special thanks are extended to Sandra L. Waisley for her efforts on this report.



DEPARTMENT OF ENERGY OIL AND GAS PROGRAMS

DOE OIL AND GAS TECHNOLOGY PROGRAM CONTACTS

Advanced Drilling, Completion, and Stimulation Systems

ELENA SUBIA MELCHERT
(202) 586-5095
elena.melchert@hq.doe.gov

RHONDA LINDSEY
(918) 699-2037
rlindsey@npto.doe.gov

ROY LONG
(304) 285-4236
rlong@fetc.doe.gov

Advanced Diagnostics and Imaging Systems

EDITH ALLISON
(202) 586-1023
edith.allison@hq.doe.gov

ROBERT LEMMON
(918) 699-2035
blemmon@npto.doe.gov

JAMES AMMER
(304) 285-4383
jammer@fetc.doe.gov

Reservoir Efficiency Processes

GEORGE STOSUR
(202) 586-8379
george.stosur@hq.doe.gov

BETTY FELBER
(918) 699-2031
bfelber@npto.doe.gov

ALEX CRAWLEY
(918) 699-2055
acrawley@npto.doe.gov

Reservoir Life Extension

GEORGE STOSUR
(202) 586-8379
george.stosur@hq.doe.gov

BETTY FELBER
(918) 699-2031
bfelber@npto.doe.gov

GARY SAMES
(412) 892-4347
sames@fetc.doe.gov

JERRY CASTEEL
(918) 699-2042
jcasteel@npto.doe.gov

Gas Storage

CHRISTOPHER FREITAS
(202) 586-1657
christopher.freitas@hq.doe.gov

JAMES AMMER
(304) 285-4383
jammer@fetc.doe.gov

THOMAS MROZ
(304) 285-4071
tmroz@fetc.doe.gov

MARA DEAN
(412) 892-4520
dean@fetc.doe.gov

GARY SAMES
(412) 892-4347
sames@fetc.doe.gov

Environmental Research and Analysis

WILLIAM HOCHHEISER
(202) 586-5614
william.hochheiser@hq.doe.gov

NANCY JOHNSON
(202) 586-6458
nancy.johnson@hq.doe.gov

DAVID ALLEMAN
(918) 699-2057
dalleman@npto.doe.gov

SUSAN GREGERSEN
(202) 586-0063
susan.gregersen@hq.doe.gov

PETER LAGIOVANE
(202) 586-8116
peter.lagiovane@hq.doe.gov

NANCY HOLT
(918) 699-2059
nholt@npto.doe.gov

JOHN FORD
(918) 699-2061
jford@npto.doe.gov

Oil Processing

ARTHUR HARTSTEIN
(301) 903-2760
arthur.hartstein@hq.doe.gov

DEXTER SUTTERFIELD
(918) 699-2039
dsutterf@npto.doe.gov

Gas Processing

ARTHUR HARTSTEIN
(301) 903-2760
arthur.hartstein@hq.doe.gov

VENKAT VENKATARAMAN
(304) 285-4105
vvenka@fetc.doe.gov

DANIEL DRISCOLL
(304) 285-4717
ddrisc@fetc.doe.gov

ANTHONY ZAMMERILLI
(304) 285-4641
azamme@fetc.doe.gov

CHARLES BYRER
(304) 285-4547
cbyrer@fetc.doe.gov

Oil & Gas Modeling and Analysis

JOHN PYRDOL
(301) 903-2773
john.pyrdol@hq.doe.gov

ELENA SUBIA MELCHERT
(202) 586-5095
elena.melchert@hq.doe.gov

ANTHONY ZAMMERILLI
(304) 285-4641
azamme@fetc.doe.gov

R. MICHAEL RAY
(918) 699-2010
rray@npto.doe.gov

Natural Gas & Petroleum Import and Export Activities

DONALD JUCKETT
(202) 586-8830
donald.juckett@hq.doe.gov

CLIFF TOMASZEWSKI
(202) 586-9460
cliff.tomaszewski@hq.doe.gov

JOHN GLYNN
(202) 586-9454
john.glynn@hq.doe.gov

Natural Gas Market Access Program

PETER LAGIOVANE
(202) 586-8116
peter.lagiovane@hq.doe.gov

CHRISTOPHER FREITAS
(202) 586-1657
christopher.freitas@hq.doe.gov

HBCU Internship

DOROTHY FOWLKES
(202) 586-7421
dorothy.fowlkes@hq.doe.gov

Hispanic Internship

ELENA SUBIA MELCHERT
(202) 586-5095
elena.melchert@hq.doe.gov

Policy Development and Planning

MICHAEL YORK
(202) 586-5669
michael.york@hq.doe.gov

NANCY JOHNSON
(202) 586-6458
nancy.johnson@hq.doe.gov

Technology Transfer

PETER LAGIOVANE
(405) 586-8116
peter.lagiovane@hq.doe.gov

HERB TIEDEMANN
(202) 699-2017
htiedema@npto.doe.gov

Communications

TRUDY TRANSTRUM
(202) 586-7253
trudy.transtrum@hq.doe.gov

BRENDA STEWART
(202) 586-8020
brenda.stewart@hq.doe.gov



DEPARTMENT OF ENERGY OIL AND GAS PROGRAMS

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OFFICE OF NATURAL GAS AND PETROLEUM TECHNOLOGY

http://www.fe.doe.gov/programs_oilgas.html

Details on oil and gas research and development projects, with links to Fossil Energy's Strategic Petroleum Reserve and the Naval Oil Shale Petroleum Reserves sites.

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National technology clearinghouse for oil and gas producers, offering software, workshops, and resources for industry, especially small independent producers.

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- NATURAL GAS AND OIL TECHNOLOGY PARTNERSHIP (NGOTP) *Albuquerque, NM*
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DEPARTMENT OF ENERGY OIL AND GAS PROGRAMS

DOE OUTREACH TEAM MEMBERS

Appalachia

(E-KY, NY, OH, PA, TN, VA, WV)

LOU CAPITANIO

HQ Co-Chair

(202) 586-5098

AL YOST (FETC)

Field Co-Chair

(304) 285-4479

Central Gulf

(LA)

NANCY JOHNSON

HQ Co-Chair

(202) 586-6458

BETTY FELBER (NPTO)

Field Co-Chair

(918) 699-2031

Eastern Gulf

(AL, FL, MS)

NANCY JOHNSON

HQ Co-Chair

(202) 586-6458

BETTY FELBER (NPTO)

Field Co-Chair

(918) 699-2031

Midwest

(W-KY, IL, IN, MI)

ELENA S. MELCHERT

HQ Co-Chair

(202) 586-5095

BILL GWILLIAM (FETC)

Field Co-Chair

(304) 285-4401

North Midcontinent

(KS, MO)

HERB TIEDEMANN (NPTO)

Field Chair

(918) 699-2017

Rocky Mountains

(CO, ID, MT, ND, NE, NV, SD, UT, WY)

BILL HOCHHEISER

HQ Co-Chair

(202) 586-5614

RHONDA LINDSEY (NPTO)

Field Co-Chair

(918) 699-2037

South Midcontinent

(AR, OK)

BILL LAWSON (NPTO)

Field Chair

(918) 699-2001

Southwest

(AZ, NM)

CHRISTOPHER FREITAS

HQ Co-Chair

(202) 586-1657

ROBERT LEMMON (NPTO)

Field Co-Chair

(918) 699-2061

Texas

(TX)

EDITH ALLISON

HQ Co-Chair

(202) 586-1023

CHARLES BYRER (FETC)

Field Co-Chair

(304) 285-4547

West Coast

(AK, CA, OR, WA)

ART HARTSTEIN

HQ Co-Chair

(301) 903-2760

HUGH GUTHRIE (FETC)

Field Co-Chair

(304) 285-4632

National

GUIDO DEHORATHIS

HQ Chair

(202) 586-7296

HUGH GUTHRIE (FETC)

Field Co-Chair

(304) 285-4632

BILL LAWSON (NPTO)

Field Co-Chair

(918) 699-2001



REFERENCES

Foreword

American Petroleum Institute. *Basic Petroleum Data Book*, July 1998.

Department of Energy, Energy Information Administration. *Advance Summary—U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1997 Annual Report*, September 1998.

Department of Labor, Bureau of Labor Statistics, <http://stats.bls.gov>

Independent Petroleum Association of America. *The Oil & Gas Producing Industry in Your State 1997–1998*, November 1997.

Our Quality of Life Relies on Oil and Gas

and

A History of Innovation

American Petroleum Institute. *Basic Petroleum Data Book*, July 1998.

American Petroleum Institute. *Petroleum Industry Environmental Performance 6th Annual Report*, 1998.

American Petroleum Institute. *Promoting Partnerships: Cooperation Between the Petroleum Industry and Environmental, Education and Community Groups*, 1996.

American Petroleum Institute. *Strategies for Today's Environmental Partnership*, 1997.

Chambers, Mike R. *Multilateral Technology Gains Broader Acceptance*, *Oil & Gas Journal*, November 23, 1998.

Collett, Timothy S., and Vello A. Kuuskraa. Hydrates Contain Vast Store of World Gas Resources. *Oil & Gas Journal*, May 11, 1998.

Conoco, Inc., www.conoco.com

Department of Energy, Energy Information Administration. *Advance Summary—U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 1997 Annual Report*, September 1998.

Department of Energy, Energy Information Administration. *Annual Energy Outlook 1998*, December 1997.

Department of Energy, Energy Information Administration. *Annual Energy Review 1997*, July 1998.

Department of Energy, Energy Information Administration. *Impacts of the Kyoto Protocol on U.S. Energy Markets and Economic Activity*, October 1998.

Department of Labor, *Bureau of Labor Statistics*, <http://stats.bls.gov>

Department of Labor, Occupational Safety & Health Administration, www.osha.gov

El-Banbi, A.H. Modifications Improve Waterflood Performance Model. *Oil & Gas Journal*, January 1, 1996.

Fisher, William L. The U.S. Experience in Natural Gas. *Proceedings of the Global Gas Resources Workshop*, 1994.

Interstate Oil and Gas Compact Commission and the United States Department of Energy, Office of Fossil Energy. *Oil and Gas Exploration and Production Waste Management: A 17-State Study*, June 1993.

Milestones and Influences in U.S. Offshore History (1946–1997). *Offshore Magazine*, May 1997.

Minerals Management Service, www.mms.gov

The Nature Conservancy, www.tnc.org

Nehring, Richard. Innovation Overpowering Reserves Depletion in U.S. *Oil & Gas Journal*, November 9, 1998.

Nehring, Richard. Knowledge, Technology Improvements Boosting U.S. Upstream Opportunities. *Oil & Gas Journal*, November 2, 1998.

NewsWell: Americans Will Save \$50 Billion This Year, at E&P Firms' Expense. *Oil and Gas Investor*, June 1998.

PetroFina. *Health, Safety & Environment Report 1995–1996*, www.fina.com

Stolle, J., and L. LeBlanc. Directional Drilling in the U.S. Gulf: The First 50 Years. *Offshore Magazine*, February 1998.

Talkington, Kelly. Remote South China Sea Reservoir Prompts Extended Reach Record. *Oil & Gas Journal*, November 10, 1997.

United States Environmental Protection Agency, www.epa.gov/gasstar

Western Hemisphere Oil and Gas Environmental Forum, www.fe.doe.gov/international/whogef.html

Exploration

American Petroleum Institute. *Basic Petroleum Data Book*, July 1998.

Locke, Stephen R. Advances Reduce Total Drilling Costs. *The American Oil & Gas Reporter*, July 1998.

Shirley, Kathy. Drilling Activity Heating Up as 3-D Shines New Light on Transition Zone. *The American Oil & Gas Reporter*, April 1998.

Drilling and Completion

American Petroleum Institute. *Joint Association Survey on Drilling Costs*, 1996.

Andersen, E.E., et al. *Guidelines for Designing Safe, Environmentally Acceptable Downhole Injection Operations*. SPE 25964, 1993.

Arnold, Dan. Liquid CO₂ and Sand: An Alternative to Water-Based Stimulation Fluids, *Hart's Petroleum Engineer International*, January 1998.

Butler, J., and B. Skeen. Horizontal Well Successfully Drilled in Black Warrior Basin. *Oil & Gas Journal*, July 22, 1996.

Chambers, Mike R. Multilateral Technology Gains Broader Acceptance. *Oil & Gas Journal*, November 23, 1998.

Department of Energy. *Natural Gas & Oil Technology Partnership*, June 1997.

Deskins, W.G. Survey Shows Successes, Failures of Horizontal Wells. *Oil & Gas Journal*, June 19, 1995.

Faure, A., and J. Simmons. *Coiled Tubing Drilling: A Means to Minimize Environmental Impact*, SPE 27156, 1994.

Greenberg, Jerry. Managing Loss-of-Control in Deepwater Drilling. *Offshore Magazine*, April 1998.

Knoll, R.G. Buzzwords Can Lead to Poor Results. *The American Oil & Gas Reporter*, September 1998.

Locke, Stephen R. Advances Reduce Total Drilling Costs. *The American Oil & Gas Reporter*, July 1998.

Lyle, Don. Drilling Technology Accelerates. *Hart's Oil and Gas World*, November 1996.

Mason, Richard. Technology Sparks Drilling Revolution: Horizontal Drilling Broadening Mindset, Opening New Possibilities. *The American Oil & Gas Reporter*, September 1998.

Rappold, Keith. Industry Pushes Use of PDC Bits to Speed Drilling, Cut Costs. *Oil & Gas Journal*, August 14, 1995.

Society of Petroleum Engineers. Monograph Volume 12: *Recent Advances in Hydraulic Fracturing*.

REFERENCES

- Stevens, S., et al. Technology Spurs Growth of U.S. Coalbed Methane. *Oil & Gas Journal*, January 1, 1996.
- Talkington, Kelly. Remote South China Sea Reservoir Prompts Extended Reach Record. *Oil & Gas Journal*, November 10, 1997.
- Veil, J.A., et al. Synthetic-Based Muds Can Improve Drilling Efficiency Without Polluting. *Oil & Gas Journal*, March 4, 1996.
- Wolhart, Steve. New Initiatives in Hydraulic Fracture Diagnostics. *GasTIPS*, Fall 1998.
- Production**
- American Petroleum Institute. *Basic Petroleum Data Book*, July 1998.
- Boyson, J.E., et al. *Field Demonstration of the Freeze-Thaw/Evaporation Process for the Treatment of Produced Waters in the San Juan Basin of New Mexico*. SPE 37904, 1997.
- Department of Energy, Energy Information Administration. *Natural Gas Annual 1996*, September 1997.
- Independent Petroleum Association of America. *The Oil & Gas Producing Industry in Your State 1997–1998*, November 1997.
- Interstate Oil and Gas Compact Commission. *Marginal Oil and Gas Report*, 1998.
- Moritis, Guntis. EOR Oil Production Up Slightly. *Oil & Gas Journal*, April 20, 1998.
- Peats, A., et al. *Application of ESP Oil Water Separation System in the Swan Hills Unit One Field—A Case Study*, SPE ESP Workshop, 1997.
- South Belridge 15th Billion Barrel Field in U.S. *Oil & Gas Journal*, October 16, 1995.
- Site Restoration**
- California Environmental Protection Agency Exploration and Production Regulatory Task Force (Road Mix Working Group). *Beneficial Use of Road Mix—Clarification of Issues and Regulatory Roles*, December 1996.
- Environmental Solutions, Inc. (Prepared for the Western States Petroleum Association). *Evaluation and Review of the Petroleum Industry's Road Mix Process*, March 1993.
- Kebodeaux, T.R. Death of a Platform: Artificial Reef Programs Provide a Rebirth to Decommissioned Structures. *UnderWater Magazine*, Spring 1995.
- The Nature Conservancy. *Preserve Profiles: Trans-Pecos Diamond Y Springs*, www.tnc.org
- Oklahoma Energy Resources Board, www.oerb.com
- Rigs to Reefs: A Win-Win Program. *Journal of Petroleum Technology*, January 1995.
- Shaffer, Gary P., et al. *Restored Drill Cuttings for Wetlands Creation: Year One Results of a Mesocosm Approach to Emulate Field Conditions Under Varying Hydrologic Regimes*. Southeastern Louisiana University Wetlands Restoration Laboratory, December 1996.
- Operations in Sensitive Environments**
- Alaskan North Slope Operators Shift Focus from Stemming Decline to Hiking Production. *Oil & Gas Journal*, August 24, 1998.
- Alaska Department of Natural Resources, Division of Oil and Gas. *Evolution of Petroleum Development Technology on Alaska's North Slope... Reduced Impacts and Enhanced Environmental Protection*, June 1995.
- ARCO Long Beach, Inc., www.arco.com
- Arctic Power, www.anwr.org
- BP Exploration (Alaska) Inc. *Fact Sheet: Habitat Enhancement*, 1998.
- BP Exploration (Alaska) Inc. *Fact Sheet: Ice Roads and Pads*, 1998.
- BP Exploration (Alaska) Inc. *Fact Sheet: Reducing Impacts*, 1998.
- BP Exploration (Alaska) Inc. *Fact Sheet: Restoration Techniques*, 1998.
- California Department of Conservation, Division of Oil, Gas, and Geothermal Resources. *Los Angeles Downtown Oil Field*, 1994.
- Cold-War Stealth Science Can Aid Seismic Interpretation. *Journal of Petroleum Technology*, January 1998.
- Crow, Patrick. ANWR Leasing Issue Destined to Heat up Again in Congress. *Oil & Gas Journal*, August 28, 1995.
- Hazen, Beez. *Use of Ice Roads and Ice Pads for Alaskan Arctic Oil Exploration Projects*. Symposium paper for Science, Traditional Knowledge, and the Resources of the Northeast Planning Area of the National Petroleum Reserve-Alaska, sponsored by the Bureau of Land Management and Minerals Management Service, April 16–18, 1997, Anchorage, Alaska.
- Hunt, Mike. Drilling Site on a National Seashore Required Extra Environmental Precautions. *Oil & Gas Journal*, November 6, 1995.
- The Nature Conservancy, www.tnc.org
- Navarro, A.R. Innovative Techniques Cut Costs in Wetlands Drilling. *Oil & Gas Journal*, November 14, 1991.
- Long Life Seen for Giant Wilmington Oil Field. *Oil & Gas Journal*, November 25, 1996.
- Smith, R.M. *The Hunter Creek Well: The Successful Drilling of an Exploratory Well in an Environmentally Sensitive Area*. SPE 28704, 1995.
- Stanley, Mark J., and Beez Hazen. *Insulated Ice Pad Technology Enables Extended Drilling Season on Alaska's North Slope*. SPE 35686, 1996.
- Unocal Corporation. *1996–97 Health, Environment & Safety Report*, www.unocal.com
- The Future Challenges**
- American Association of Petroleum Geologists. *21st Century Review Committee Report*, May 1998.
- American Petroleum Institute. *Basic Petroleum Data Book*, July 1998.
- Baker, H. Personal Correspondence to the U.S. Department of Energy, 1999.
- Bishop, R. Gifts of Mentors Keep on Giving. *AAPG Explorer*, December 1998.
- BP Amoco p.l.c., www.bpamoco.com
- California Independent Petroleum Association. *The Monday Morning Report*, September 27, 1999.
- Crow, P. Associations, Government Help U.S. Independents Grapple with Low Oil Prices. *Oil & Gas Journal*, January 11, 1999.
- Department of Labor, Bureau of Labor Statistics, <http://stats.bls.gov>
- Department of Energy, Energy Information Administration. *Annual Energy Outlook 1999*, December 1998.
- Department of Energy, Energy Information Administration. *Annual Energy Review 1997*, July 1998.
- Department of Energy. *Comprehensive National Energy Strategy*, April 1998.



REFERENCES

- Department of Energy, Energy Information Administration. *Impacts of the Kyoto Protocol on U.S. Energy Markets and Economic Activity*, October 1998.
- Department of Energy, Energy Information Administration. *International Energy Outlook 1998*, April 1998.
- Department of Energy, Energy Information Administration. Form EIA-28 (Financial Reporting System).
- Department of Energy, Energy Information Administration. *Petroleum Supply Monthly*, December 1998.
- Department of Energy, Secretary of Energy Advisory Board. *Energy R&D: Shaping Our Nation's Future in a Competitive World*, June 1995.
- Gaddy, Dean E. Rig Activity Fails to Bounce Back Despite \$20/bbl Oil. *Oil & Gas Journal*, September 20, 1999.
- Gas Research Institute. *Approved 1999-2003 Research and Development Program and 1999 Research and Development Plan*, April 1998.
- Independent Petroleum Association of America. *1996 Profile of Independent Producers*, www.ipaa.org
- Interlaboratory Working Group. *Scenarios of U.S. Carbon Reductions: Potential Impacts of Energy-Efficient and Low-Carbon Technologies by 2010 and Beyond*. Oak Ridge National Laboratory and Lawrence Berkeley National Laboratory, 1997.
- Interstate Oil and Gas Compact Commission. *Marginal Oil and Gas Report*, 1998.
- Interstate Oil and Gas Compact Commission. *A Battle for Survival? The Real Story Behind Low Oil Prices*, 1999.
- Lichtblau, J. Testimony before the Senate Energy and Natural Resources Committee Oversight Hearing. *State of the Petroleum Industry*, January 28, 1999.
- National Academy of Sciences. *Oil in the Sea: Inputs, Fates, and Effects*, 1985.
- National Environmental Education and Training Foundation, www.neetf.org
- National Laboratory Directors. *Technology Opportunities to Reduce U.S. Greenhouse Gas Emissions*, 1997.
- National Petroleum Council. *The Potential for Natural Gas in the United States*, 1992.
- National Petroleum Council. *Future Issues—A View of U.S. Oil & Natural Gas to 2020*, 1995.
- President's Committee of Advisors on Science and Technology. *Federal Energy Research and Development for the Challenges of the Twenty-First Century*, November 1997.
- Salomon: U.S. Leads Decline in E&P Spending. *Oil & Gas Journal*, April 5, 1999.
- Schafer, E. Testimony before the Senate Energy and Natural Resources Committee Oversight Hearing. *State of the Petroleum Industry*, January 28, 1999.
- U.S. Department of State, www.state.gov
- Photography**
- CANRIG—page 35
- Corbis Images—pages 12, 19, 21, 51, 66 (circuit square), 69, 78 (tractor); fact sheets 30 through 32 (upper left icon: tractor)
- Haliburton Energy Services—page 38
- Hart Publications—fact sheets 19 (freezing operations), 24 (men with gun)
- Larry Lee Photography—cover (rig); pages 11, 24-25
- Panoramic Images—pages 58-59 (arctic skyline), 60-61 (trees / grass), 62-63 (city skyline), 64-65 (snowscape)
- Pennsylvania Historical & Museum Commission, Drake Well Museum Collection, Titusville, PA—page 10
- PhotoDisc—cover (polar bear / water, clouds / grass); inside front; pages 2 (fish, flag), 3, 6-7, 13, 18, 25 (alligator), 31 (ocean map), 44-45 (pine cones), 48-49, 53, 54, 55 (starfish, snail), 60 (beach), 63 (LA harbor), 64 (deer), 65 (black bear), 67 (boilers), 68 (leaf), 73; fact sheets 26 (rig), 31 (boat), 32 (country road), 33 (mountains), 35 (polar bears)
- Picture Perfect—pages 21 (family), 22 (boys), 23, 44-45 (pipeline / trees), 52, 57, 78 (rig); fact sheets 33 through 36 (upper left icon: rig)
- RBI-Gearhart—page 34
- Rentech, Inc.—fact sheet 20 (diesel fuel jars)
- Society of Petroleum Engineers (SPE)—pages 1, 27, 31 (supply vessel), 33, 35, 43, 46, 76-77, 78 (rig, man, drill); fact sheets 1 through 29 (upper left icons: rig, man, drill); 4, (computer), 8 (hydraulic), 9 (rig in water), 12 (exploration operations), 16 (pipeline), 17 (pump), 28 (rig)
- The Stock Market—pages 55 (housing background), 58 (salmon), 66 (building)
- Sundowner Offshore Services—page 30
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- Tony Stone Images—cover (globe); pages 2 (pump jack), 4-5, 9, 15, 61 (small rig), 66-67 (hands with globe, field), 68 (road)
- Walt Seng Photography—page 7 (rollerblader)
- WZI, Inc.—fact sheet 6 (truck / drill)

Acknowledgements

This report was prepared by the U.S. Department of Energy, Assistant Secretary for Fossil Energy, Office of Natural Gas and Petroleum Technology, and supported by:

ICF Consulting

Technical and Analytical Content
Peter M. Crawford
Michael L. Godec
Richard S. Karp
and others

Brandege, Inc. / Pittsburgh, PA*Editorial and Design*

Nancy A. Reese
Joe Tomko
with:
Robert C. Brandege
Sarah H. Cornelius
Ann Kennedy
Emily A. Klein
Linda M. Ross
Karen D. Snyder
Julie E. Tabaka
Evan Wimer

WZI, Inc.

Technical Review
Theodore R. Blevins
Jesse D. Frederick
Mary Jane Wilson

Additional Contributors

Full Circle Type, Inc.
Industrial Illustrators

Furthering National Energy Goals

Comprehensive National Energy Strategy

In coming decades, our quality of life will depend significantly on scientific and technological advances supported by today's energy policies:

- Improve the efficiency of the energy system. **Efficient resource use is a fundamental tenet of sustainable development, enhancing overall economic performance while protecting the environment and advancing national security.**
- Ensure against energy disruptions. **Reducing the vulnerability of the United States economy to disruptions in oil supply relies on stabilizing domestic oil production; maintaining readiness of the Strategic Petroleum Reserve, our Nation's oil stockpile; diversifying import sources; and reducing consumption.**
- Promote energy production and use in ways that respect health and environmental values. **Improving our health and local, regional, and global environment quality must be integral to domestic energy production. Advanced oil and gas technologies are critical to achieving this goal.**
- Expand future energy choices. **Pursuing continued progress in science and technology will provide future generations with a robust portfolio of clean and reasonably priced energy sources.**
- Cooperate internationally on global issues. **The development of open, competitive international energy markets and facilitating the adoption of clean, safe and efficient energy systems are vital to addressing global economic, security, and environmental concerns. Advanced oil and gas technologies provide opportunities for international cooperation and demonstrating United States leadership.**

Source: Comprehensive National Energy Strategy, Department of Energy, 1998

CONTACT



U.S. Department of Energy
Office of Fossil Energy
1000 Independence Avenue, SW
Washington, DC 20585

Nancy L. Johnson
(202) 586-6458
nancy.johnson@hq.doe.gov

Trudy Transtrum
(202) 586-7253
trudy.transtrum@hq.doe.gov