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# Finding the Balance

## The Role of Natural Gas in America's Energy Future

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### **About NRDC**

The Natural Resources Defense Council is an international nonprofit environmental organization with more than 1.2-million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, and Beijing. Visit us at [www.nrdc.org](http://www.nrdc.org).

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# Executive Summary

Americans use natural gas in their homes for heat, hot water, and cooking, and for commercial use in areas including manufacturing and electricity generation. Efficient use of natural gas—the cleanest-burning of all fossil fuels—can result in substantially lower emissions of global warming pollution than many alternatives. But this does not mean we need to drill for more natural gas in valuable wild places. Invading pristine places for natural gas that we can get elsewhere would be an irreparable and costly mistake. Investments in efficiency cost less than drilling and bring benefits to the market faster than trying to increase supplies. By reducing the demand for natural gas quickly, increased efficiency will bring down the price of gas and lower bills for the average consumer right away. Congress can provide short-term benefits and long-term energy solutions by adopting policies that incentivize energy efficiency and support development of renewable energy sources.

## Drilling on Public Land Is Not the Fastest Way to Lower Prices

More drilling on public land is not the answer as it is not the fastest way to lower gas prices. From 2001 to 2006 in the West, drilling on public land, natural gas production, and the number of acres leased all increased substantially. Yet during that same period residential natural gas prices rose from an annual average of around \$12 per thousand cubic feet to around \$15 per thousand cubic feet.

Further, there is already more land available to industry than it can drill. More than 80 percent of natural gas resources on federal lands in the intermountain West are available for leasing and development. As of the end of 2006, of the more than 42 million acres already leased for oil and gas production, only about 12 million acres were in production. Simply leasing more federal land or issuing more permits will not likely increase supply or lower prices.

## Future Demand Can Be Met With Existing Natural Gas Resources

Given the substantial untapped natural gas resources in America, there is no need to sacrifice our nation's treasured wild places in order to meet the nation's energy needs. According to U.S. Geological Survey (USGS) and Minerals Management Service (MMS) assessments, the nation has more than 1,000 trillion

## The Role of Natural Gas In Our Energy Future

1. **Boost efficiency and renewable energy.** Greater efficiency is the fastest, cheapest way to lower energy costs and reduce global warming pollution. Natural gas can help in the short term, but it is not an answer in the long term. Our energy future must not depend on fossil fuels.
2. **Maximize existing resources.** We have large amounts of natural gas available right now. We do not need to sacrifice our wild places and wildlife to get the gas we need.
3. **Drill safely.** To get the natural gas that we have to market cheaply and efficiently, we must reduce controversy that surrounds it. We must ensure the use of best practices to protect air, water, wildlife, health, and property when drilling.

cubic feet (Tcf) of untapped natural gas resources. A recent study by Navigant Consulting estimates that the untapped resources are double this amount. While some of these resources are within protected areas, the vast majority are not.

### **Policy Solutions Boost Energy Efficiency and Curb Global Warming**

Investments in greater efficiency hold tremendous potential for reducing energy prices and emissions of global warming pollution at the same time. Congress must enact a number of energy-saving measures that will promote efficiency and pass the savings on to consumers:

1. **Mandatory limits on global warming pollution.**
2. **Tax incentives for energy efficiency and renewable energy.**
3. **Performance-based incentives for existing home retrofits** and full funding of the Low-Income Home Energy Assistance Program and Weatherization Assistance Program.
4. **Increased funding for federal energy efficiency programs** such as Energy Star.
5. **A nationwide energy efficiency education campaign** such as the successful California Flex Your Power campaign.
6. **Strong energy efficiency performance standards for certain appliances and equipment.**
7. **Increases in the energy efficiency standards of building codes**, including national model energy codes for residential and commercial buildings designed to increase their efficiency levels 30 percent by 2010 and 50 percent by 2020.

## CHAPTER 1

# Natural Gas Is a Bridge, Not a Solution

As the cleanest-burning of all fossil fuels, natural gas can result in substantially lower emissions of global warming pollution when compared with fuels such as oil and coal. Further, the increasingly efficient use of natural gas can serve an important role in meeting America's energy needs while transitioning to a truly clean energy economy. Yet, natural gas is a finite fossil fuel and cannot be relied upon as a long-term, low-cost source of energy or as a solution to global warming. While generating electricity with efficient natural gas combined cycle units produces 60 percent less carbon dioxide per kilowatt-hour than conventional coal-fired power plants, even these emission levels are too high in relation to America's need to reduce emissions 80 percent or more by mid-century in order to prevent dangerous global warming.

### The Cost of Opening More Public Lands to Drilling

Although burning natural gas results in less air pollution than using coal and oil, the environmental impacts of producing and using natural gas remain substantial. With well fields potentially covering thousands of acres, drilling can quickly transform a natural habitat into an industrial landscape.<sup>1</sup> Each field of well pads is accompanied by a dense web of power lines, miles of pipelines and roads, waste pits, compressors, and other production facilities. Drilling on public lands has displaced wildlife and fragmented their habitats, fouled treasured fishing streams and hunting grounds, and scarred sacred sites and cultural resources.<sup>2</sup>

Diesel trucks driving back and forth daily on well field dirt roads increase dust and erosion.<sup>3</sup> Drilling activities pollute once-quiet open space with noisy machinery that runs continuously. In many places where development is now occurring, skies are sullied by emissions from drilling, pumping, and processing operations, including hazardous pollutants.<sup>4</sup> Expanding oil and gas operations are contributing to unhealthy ozone levels.<sup>5</sup> In some states, drilling operations are a major source of greenhouse gases.<sup>6</sup>



CREDIT: ECOFLIGHT PHOTO PROVIDED BY SKYTRUTH ([WWW.SKYTRUTH.ORG](http://WWW.SKYTRUTH.ORG))

Natural gas operations have transformed the landscape at Jonah Field in Wyoming's Green River Basin.

Drilling for gas also brings dangerous changes underground. Drilling operations can deplete underground aquifers and threaten drinking water wells. In places like Wyoming's Powder River Basin, for example, each coal bed methane well pumps thousands of gallons of water a day from precious aquifers.<sup>7</sup> Hazardous waste from these operations is often dumped in open pits where it may seep into groundwater or be carried by the wind into nearby homes and communities.<sup>8</sup> Many people who live near oil and gas operations are experiencing symptoms resembling those caused by the toxic substances found in oil and gas. Elizabeth and Steve Mobaldi of Rifle, Colorado, experienced burning eyes, nosebleeds, and painful headaches. A well with an open disposal pit was located about 300 feet from their house.<sup>9</sup>

Offshore gas drilling also brings its own unique forms of environmental damage.<sup>10</sup> Offshore seismic exploration creates noise pollution harmful to whales and other marine mammals that depend on sound to communicate.<sup>11</sup> Extraction of oil or gas from beneath the ocean floor creates large amounts of drilling waste containing toxic metals and other contaminants, most of which is dumped untreated into surrounding waters.<sup>12</sup> Both onshore and offshore operations generate large amounts of "produced water," which is brought up from wells along with oil and gas. Produced water contains a variety of toxic pollutants; when generated offshore it is typically discharged into the ocean with minimal treatment. Moreover, offshore development requires onshore infrastructure, including pipelines, in order to support its operations. This infrastructure can cause significant harm to salt marshes and other coastal resources. Further, the industrialization associated with offshore development is often in competition with the existing economic base of affected coastal communities reliant upon tourism and fishing.<sup>13</sup>

In many cases, relatively simple and inexpensive controls are available to prevent damage to the environment and the health of residents.<sup>14</sup> Comprehensive site planning can minimize the risk to sensitive habitats such as coastal wetlands. Effective inspection, enforcement, and monitoring of all stages of construction and operation of production facilities can reduce overall risks.

Unfortunately, these controls are not uniformly used. Despite the dangerous materials involved in oil and gas production, the industry enjoys exemptions from provisions of U.S. law—including the Clean Air Act, Clean Water Act, Safe

Drinking Water Act, Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation and Liability Act (also known as the Superfund law)—all of which are critical to protecting human health and the environment.<sup>15</sup>

## Sensitive Areas Should Not Be Drilled

Given the impacts of drilling, NRDC has identified sensitive areas both onshore and offshore that should be off-limits to exploration and development activities. Domestically, these areas include the Arctic National Wildlife Refuge, Utah's Redrock Canyon Country, Wyoming's Red Desert, and New York's Catskills. Sensitive areas of the U.S. Outer Continental Shelf include waters offshore of Alaska, in the eastern Gulf of Mexico, and off of the east and west coasts.

Outside of the United States there are special places, including national parks, protected areas, and areas with significant biodiversity, which deserve protection. In 2002, the government of Costa Rica decided not to permit offshore oil development on the Caribbean coastline of Costa Rica, which contains coral reefs, mangroves, sea turtle beaches, and a number of protected areas. In Alberta, Canada, the Castle and Big Horn areas are important elements of the Northern Rockies wildlife corridor that are not currently protected and threatened by gas development.



CREDIT: SHARON BUCCINO

Drilling has been approved along the White River near Vernal, Utah, jeopardizing this pristine area treasured for its beauty and recreational uses.



## CHAPTER 2

# Making the Most of Existing Natural Gas Resources

Given the substantial untapped natural gas resources in America, there is no need to sacrifice our nation's treasured wild places to meet the nation's energy needs. As explained below, untapped natural gas resources consist of two key components: (1) proved reserves and (2) undiscovered technically recoverable resources. According to U.S. Geological Survey (USGS) and Minerals Management Service (MMS) assessments, the nation has over 1,000 trillion cubic feet (Tcf) of untapped natural gas resources. A recent study by Navigant Consulting estimates that the untapped resources are double this amount.<sup>1</sup> Most of these resources are available now. According to Chesapeake Energy's chief, Aubrey McClendon, "The gas we're talking about is in traditional producing areas on largely private property."<sup>2</sup>

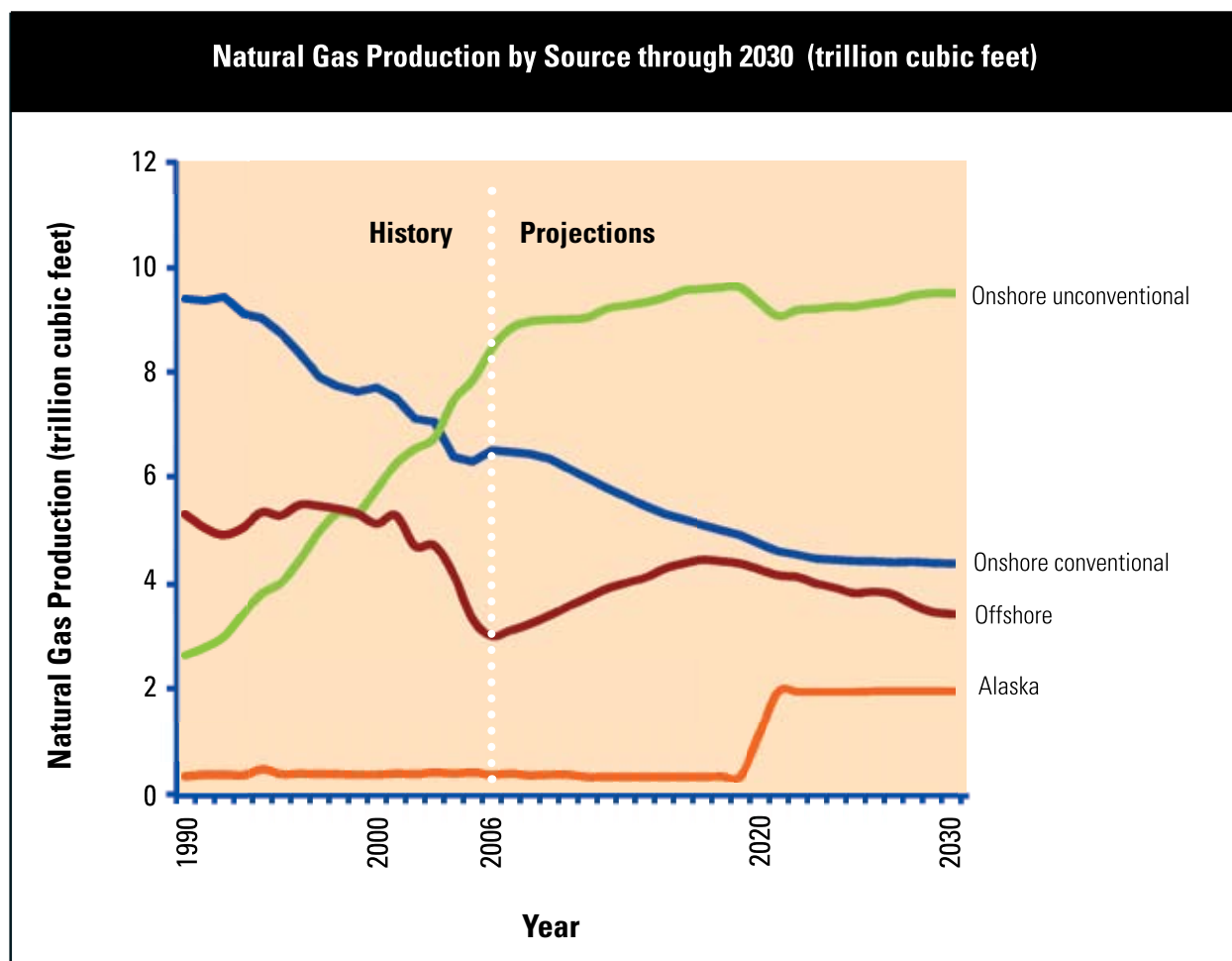
### Current and Projected Sources of Natural Gas in the United States

Production of natural gas both onshore and offshore in 2007 provided 20 Tcf, meeting 87 percent of domestic demand.<sup>3</sup> Analysis shows that America has large untapped natural gas resources to meet this demand. The Energy Information Administration has established a classification system for natural gas resources.<sup>4</sup> It is most useful to look at technically recoverable resources. These resources are divided into discovered and undiscovered resources. Discovered resources are those that geologists have actually located through exploration. Discovered recoverable resources include current production, all past production, as well as the gas remaining to be produced (known as "reserves").

When trying to determine natural gas available to meet future demand, the reserves play a critical role. Proved reserves represent the gas still in the ground that geological and engineering data indicate with reasonable certainty to be recoverable today, or in the near future, with current technology and under current economic conditions. Proved reserves are those listed "on the books" in operational and financial data of natural gas exploration and production companies. In order to avoid suffering financial losses as a result of overstating proved reserves, many companies list a high percentage of their reserves as unproven. Domestic natural gas proved reserves in 2006 were estimated at 212 Tcf, with 82 percent of proved reserves concentrated in Texas, New Mexico, Wyoming, Oklahoma, Colorado, and Gulf of Mexico Federal Offshore areas.<sup>5</sup>

In addition to proved reserves, America has large undiscovered domestic gas resources. These undiscovered recoverable resources are presumed to exist because the geologic settings are favorable. The Bureau of Land Management has estimated

that federal onshore lands (including federal minerals beneath private property) contain 231 Tcf of technically recoverable natural gas.<sup>6</sup> The percentage of these resources that are economically recoverable will depend on future prices of oil and gas. While some of these resources are within protected areas, the vast majority are open to exploration and production. Over 186 Tcf of federal onshore minerals are now open to exploration.<sup>7</sup>



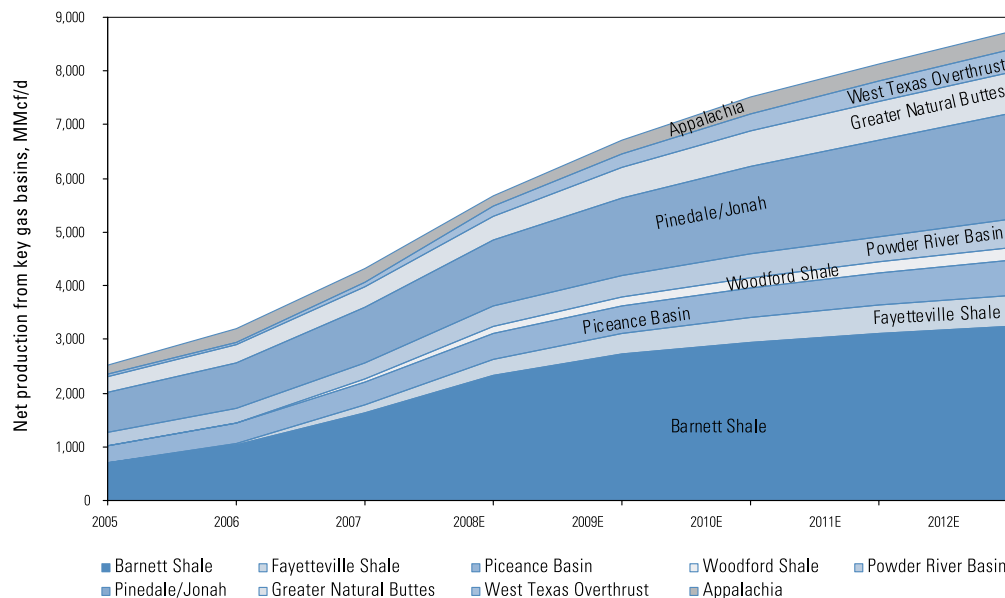
SOURCE: Energy Information Administration, [www.eia.doe.gov/oiaf/aeo/gas.html](http://www.eia.doe.gov/oiaf/aeo/gas.html)

Unconventional gas resources such as shales are providing significant growth in domestic gas production. These shales are different from the shales in Colorado and Utah that are thought to contain oil. While the technology to obtain oil from shales has not been commercially proven, many companies such as Chesapeake Energy are making large profits taking gas from shales. These areas include the Barnett Shale in Texas, the Haynesville Shale in Louisiana, and the Marcellus Shale in Pennsylvania and New York.

America can meet its needs for natural gas from existing fields without going into treasured public lands. Goldman Sachs, for example, has projected that the nation should be able to meet its natural gas needs as a result of development of existing American gas fields through 2012.

## Unconventional Gas Producing Basins Have Been Key Driver of Growth

Net Production from Gas Basins Reported By Covered Exploration and Production Companies (MMcf/d)



SOURCE: Company data, Goldman Sachs Research estimates

Opening new areas of public lands to exploration is unlikely to lower gas prices. From 2001 to 2006, drilling on public land in the West, natural gas production on these lands, and the number of acres leased all increased substantially, yet during the same period residential natural gas prices rose from an annual average of around \$12 per thousand cubic feet to around \$15 per thousand cubic feet.<sup>8</sup>

Significant oil and gas exploration and production is already occurring on the public's lands. As of the end of 2006, more than 42 million acres of federal lands were leased for oil and gas production.<sup>9</sup> In fiscal year 2006, the BLM approved a record 6,738 drilling permits—a 47 percent increase compared with 2005.<sup>10</sup>

In fact, the BLM has leased more land and issued more drilling permits than are currently being used. Much of the land leased by the BLM remains undeveloped. Of the 42 million acres leased as of the end of 2006, only approximately 12 million acres were in production.<sup>11</sup> Thousands of the drilling permits issued by the BLM remain unused. According to the BLM, only 4,708 new wells were started in 2006 compared with the 6,738 permits issued.<sup>12</sup> Consequently, simply leasing more federal land or issuing more permits will not necessarily increase supply.

### Existing Offshore Resources Hold Large Potential

The Energy Information Administration estimates that there are 15.4 trillion cubic feet of proved reserves offshore of the United States.<sup>13</sup> As explained above, proved reserves are the estimated quantities that are recoverable in future years from known reservoirs under existing economic and operating conditions.<sup>14</sup> When looking at undiscovered resources, the Gulf of Mexico offers the greatest potential. The National Petroleum Council estimates that the Gulf of Mexico potentially holds 329 Tcf of natural gas.<sup>15</sup> This is the amount of gas that is technically recoverable without regard to cost or price.<sup>16</sup>

While a moratorium on new leasing exists for certain areas off the U.S. coast, open areas can provide significant amounts of natural gas. In 2006, 4 Tcf of natural gas was withdrawn from federal leases offshore of California.<sup>17</sup> More than 95 percent of the gas withdrawn from federal leases offshore was vented into the atmosphere, flared, or reinjected. Significant gas is also being lost from oil wells in areas offshore of Alaska. More than 82 percent of the 3.5 Tcf withdrawn from state offshore areas in Alaska in 2006 was released from oil wells and wasted, rather than captured and used.<sup>18</sup>

| American Natural Gas Supply    |                                                            |                                                                                      |
|--------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                | PROVED RESERVES <sup>19</sup><br>Trillion cubic feet (Tcf) | UNDISCOVERED TECHNI-<br>CALLY RECOVERABLE <sup>20</sup><br>Trillion cubic feet (Tcf) |
| <b>ONSHORE</b>                 | <b>196</b>                                                 | <b>654.9</b>                                                                         |
| Appalachian basin              |                                                            | 70.2                                                                                 |
| PA                             |                                                            |                                                                                      |
| NY                             | 0.36                                                       |                                                                                      |
| Gulf Coast Basin <sup>21</sup> | 113.7                                                      |                                                                                      |
| TX                             | 61.8                                                       |                                                                                      |
| LA                             | 10.5                                                       |                                                                                      |
| MS                             | 0.81                                                       |                                                                                      |
| AL                             | 3.9                                                        |                                                                                      |
| OK                             | 17.5                                                       |                                                                                      |
| FL                             | 0.45                                                       |                                                                                      |
| Rocky Mt. Region               |                                                            |                                                                                      |
| NM                             | 17.9                                                       |                                                                                      |
| CO                             | 17.1                                                       |                                                                                      |
| WY                             | 23.5                                                       |                                                                                      |
| MT                             | 1.1                                                        |                                                                                      |
| UT                             | 5.1                                                        |                                                                                      |
| CA <sup>22</sup>               | 2.5                                                        |                                                                                      |
| Alaska                         | 10.2                                                       | 85 <sup>23</sup>                                                                     |
| Federal                        |                                                            | 231 <sup>24</sup>                                                                    |
| <b>OFFSHORE</b>                | <b>15.4</b>                                                | <b>420</b>                                                                           |
| Gulf of Mexico                 | 14.5                                                       | 233                                                                                  |
| Atlantic                       | --                                                         | 37                                                                                   |
| Pacific                        | 0.82                                                       | 18                                                                                   |
| Alaska                         | --                                                         | 132                                                                                  |
| <b>TOTAL</b>                   | <b>211</b>                                                 | <b>1,056<sup>25</sup></b>                                                            |

SOURCES: USGS National Oil and Gas Assessment, EIA, MMS

## Lease Terms and Conditions Protect Valuable Public Resources

The use of lease terms and conditions allows the BLM to fulfill its legal mandate to balance the value and demands of energy development with other resource uses of public lands.<sup>26</sup> The agency carries out this mandate by incorporating terms and conditions, also known as stipulations, into oil and gas leases or as conditions of approvals at the permitting stage. Energy companies agree to honor these measures when they purchase federal leases. These stipulations are routinely employed to protect wildlife, municipal water sources, and recreational and cultural resources. They typically affect the timing and/or location of development activities and only rarely prohibit development entirely.

The BLM leases generally include “standard stipulations.” Typical of such measures are prohibitions on road building on steep slopes. On occasion, the BLM imposes “no surface occupancy” stipulations, which prohibit operations directly on the surface overlaying a leased federal tract. Usually the agency does so to protect uses of the area that conflict with surface oil and gas operations and may prohibit such operations within 500 feet of surface waters, riparian areas, and wetlands or within one-quarter mile of an occupied building. Underground gas resources may still be tapped by drilling at an angle from a well pad outside the “no surface occupancy” zone. In addition, standard stipulations may prohibit construction when soil is saturated in order to protect water resources, including waters used for drinking and other domestic purposes, as well as to prevent landslides and minimize erosion.

Seasonal or “special” stipulations are used in areas where oil and gas activities at certain times of the year could pose severe threats to wildlife resources. These seasonal stipulations allow development to go forward in sensitive wildlife habitat areas except during critical periods. Sensitive habitat areas include elk calving and winter range areas, big game migration corridors, and critical raptor habitat. The BLM may restrict operations in response to requests by state fish and game agencies or the U.S. Fish and Wildlife Service when these areas are in use by the species of concern.

Although the purpose of lease terms and conditions purpose is to ensure sound and safe operations without prohibiting natural gas exploration and production, they are nevertheless frequently waived. A 2007 report found that the BLM office in Farmington, New Mexico approves on average approximately 89 percent of requests by industry for exceptions to wildlife stipulations designed to protect mule deer, elk, and pronghorn. In some years the office granted 99 percent of requests, many within a day of the request being made and without any public notice or process.<sup>27</sup>

## Delivering Much-Needed Alaskan Natural Gas to the Lower 48 States

Geologic formations already drilled within onshore state-owned lands in the Prudhoe Bay region of Alaska contain at least 35 trillion cubic feet of natural gas—an amount equal to approximately one-sixth of all U.S. proved reserves and slightly less than two years worth of nationwide consumption at current levels. A pipeline route linking these reserves to the U.S. gas transmission system, using existing rights-of-way, was approved almost twenty years ago under the auspices of the Alaska Natural Gas Transportation System. Construction of the new pipeline, which would run parallel to Alaska’s principal oil pipeline and the Alaska Highway, has yet to begin. Earlier environmental reviews should be updated immediately and the federal government along with the State of Alaska should move forward to complete the decision-making process and begin construction of the pipeline. Transporting natural gas from the Prudhoe region to the lower 48 will increase domestic natural gas supplies. The alternative plan to transport the gas to fuel tar sands oil extraction and upgrading in Alberta, Canada will exacerbate global warming and do nothing to keep natural gas prices down. For more information on the dangers of tar sands development, see [www.nrdc.org/energy/dirtyfuels\\_tar.asp](http://www.nrdc.org/energy/dirtyfuels_tar.asp).

## Balancing the Benefits and Risks of Liquefied Natural Gas

Liquefied natural gas (LNG) is natural gas that has been cooled to 261 degrees below zero Fahrenheit, reducing the volume of the gas 600-fold. Specially designed tankers with large, insulated storage compartments can carry more than 2.5 billion cubic feet (Bcf) of gas per shipment. In 2007, the United States imported approximately 771 Bcf of natural gas in the form of LNG, which is about 3 percent of its total gas consumption.<sup>28</sup>

Proposals have surfaced for many import facilities to serve the U.S. market.<sup>29</sup> While adding LNG capacity could provide additional access to natural gas reserves around the world, these are costly long-term projects with very challenging siting requirements. LNG importation facilities require large tracts of land for regasification and storage infrastructure and harbors with sufficient depth, anchorage, and turning space to accommodate LNG tankers that can measure 900 feet in length, 140 feet in width, and 36 feet in draft below the waterline.<sup>30</sup> The size and draft of LNG tankers, along with extensive local opposition and Coast Guard restrictions on LNG tanker movements in harbors and waterways, severely limit potential sites for new onshore LNG marine terminals. Moreover, LNG developers are having difficulty obtaining the long-term purchase contracts necessary to underwrite these capital-intensive installations.

Further development of LNG brings both opportunities and challenges. While LNG holds significant value as a substitute for more environmentally destructive fuels, communities facing the possibility of having an LNG facility for a neighbor are rightly concerned about the impacts living near a resource and capital-intensive industrial facility. With careful development and siting of LNG facilities combined with long-term contracts, we can take advantage of the greater price stability LNG can provide while avoiding increased reliance on dirtier fuels for electricity generation and other purposes.

Finally, development of LNG must also be carried out in such a way that we in the United States do not simply outsource the costs and risks of developing this energy source by shifting natural gas exploration and extraction to especially sensitive areas in other parts of the world or to nations lacking adequate environmental safeguards. Further, onshore and offshore LNG siting decisions must account for all potentially significant environmental impacts, taking into full account coastal zone management programs of the host states or foreign nations, allowing for full public participation, and avoiding marine sanctuaries, marine protected areas, sensitive habitats, and fragile resources like deep corals.

## Increasing Transportation Efficiency Using Plug-In Hybrids Fueled By Electricity From Natural Gas

Burning natural gas directly in cars and trucks is a relatively inefficient way to use natural gas as a transportation fuel. Instead, using natural gas to produce electricity that would be used to charge plug-in hybrid vehicles would displace more oil and avoid more greenhouse gas pollutants than shifting all vehicles to burn natural gas directly. Using natural gas to power plug-in hybrids is 40 percent more energy efficient than burning natural gas in cars—meaning for the same amount of natural gas, we can drive 40 percent more miles, save 40 percent more oil, and eliminate 3 to 4 times more global warming pollution.

Like oil industry veteran T. Boone Pickens, NRDC believes that the nation must dramatically expand wind energy and move beyond oil as the dominant transportation fuel. Pickens recommends that wind power displace all natural gas now used for electricity (natural gas represents approximately 22 percent of electricity generation). Pickens would use 100 percent of this displaced natural gas directly in natural gas vehicles. A better option is to put 50 percent of the displaced natural gas back into the grid to be used to generate electricity for plug-in hybrids, 20 percent of the displaced natural gas back into the grid to generate electricity to replace coal, and 30 percent of the displaced natural gas toward directly fueling medium and heavy-duty vehicles.

## CHAPTER 3

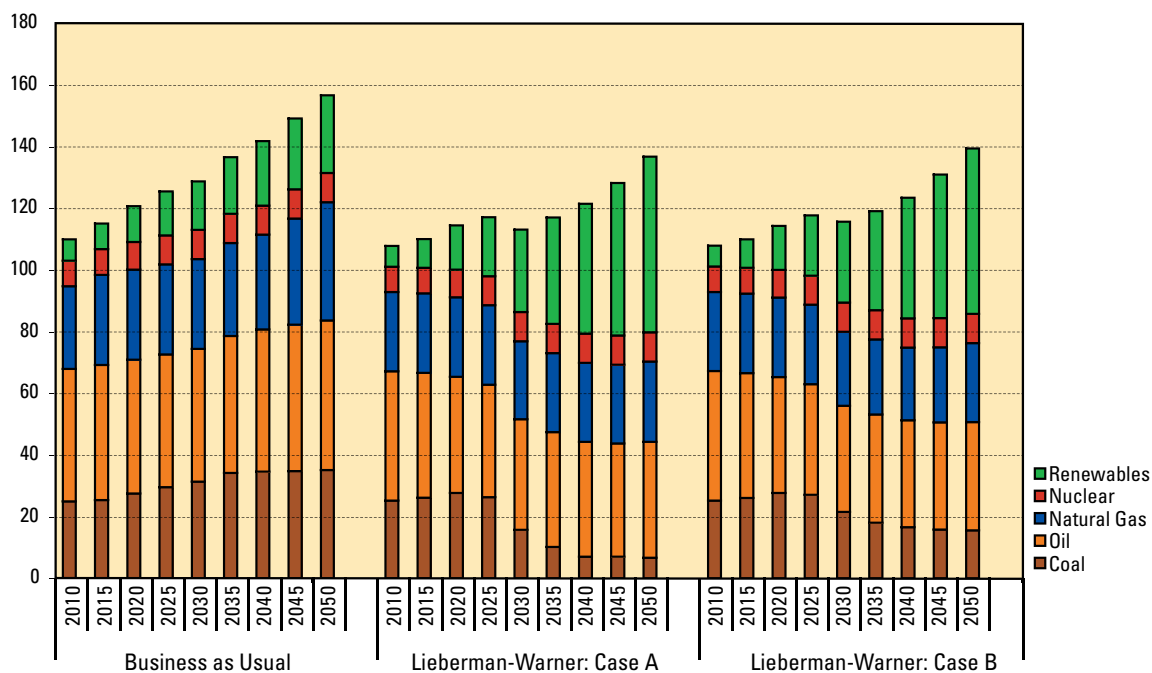
# Reducing Energy Costs Immediately Through Efficiency

The market for natural gas is closely scrutinized, with significant investments of time, money, and energy directed toward predicting the future of demand, supply, and prices. The Energy Information Administration (EIA) issues an annual Year-in-Review Report and an annual Outlook for the year ahead.<sup>1</sup> In addition, the EIA compiles monthly data regarding U.S. natural gas production, storage, imports, consumption, and prices. Despite fears to the contrary, natural gas prices were less volatile in 2007 than in recent years.<sup>2</sup> Growth in domestic natural gas production and increased storage volumes decreased prices for all end uses, with the exception of the electric power sector.<sup>3</sup> In this broader context, investments in greater natural gas efficiency hold tremendous potential for reducing energy prices and emissions of global warming pollution at the same time.

## Legislation to Curb Global Warming Supports Stable Natural Gas Market

Although some fear that legislation to curb global warming will result in significant increases in demand for natural gas and therefore drive prices higher, analysis by the U.S. Environmental Protection Agency of the 2008 Lieberman-Warner climate bill indicates that the net effect of the legislation on natural gas prices would be negligible.<sup>4</sup> While natural gas enjoys a carbon dioxide (CO<sub>2</sub>) emissions advantage relative to coal and oil, it suffers a disadvantage relative to energy efficiency and renewable energy options. The EPA's analysis of the Lieberman-Warner Climate Security Act shows that these effects offset each other such that natural gas demand and prices would be lower in the presence of a national effort to curb global warming than they would be in a business-as-usual scenario. Analysis by the International Resources Group (IRG) confirms this conclusion.<sup>5</sup>

PROJECTED MIXES OF U.S. ENERGY SOURCES

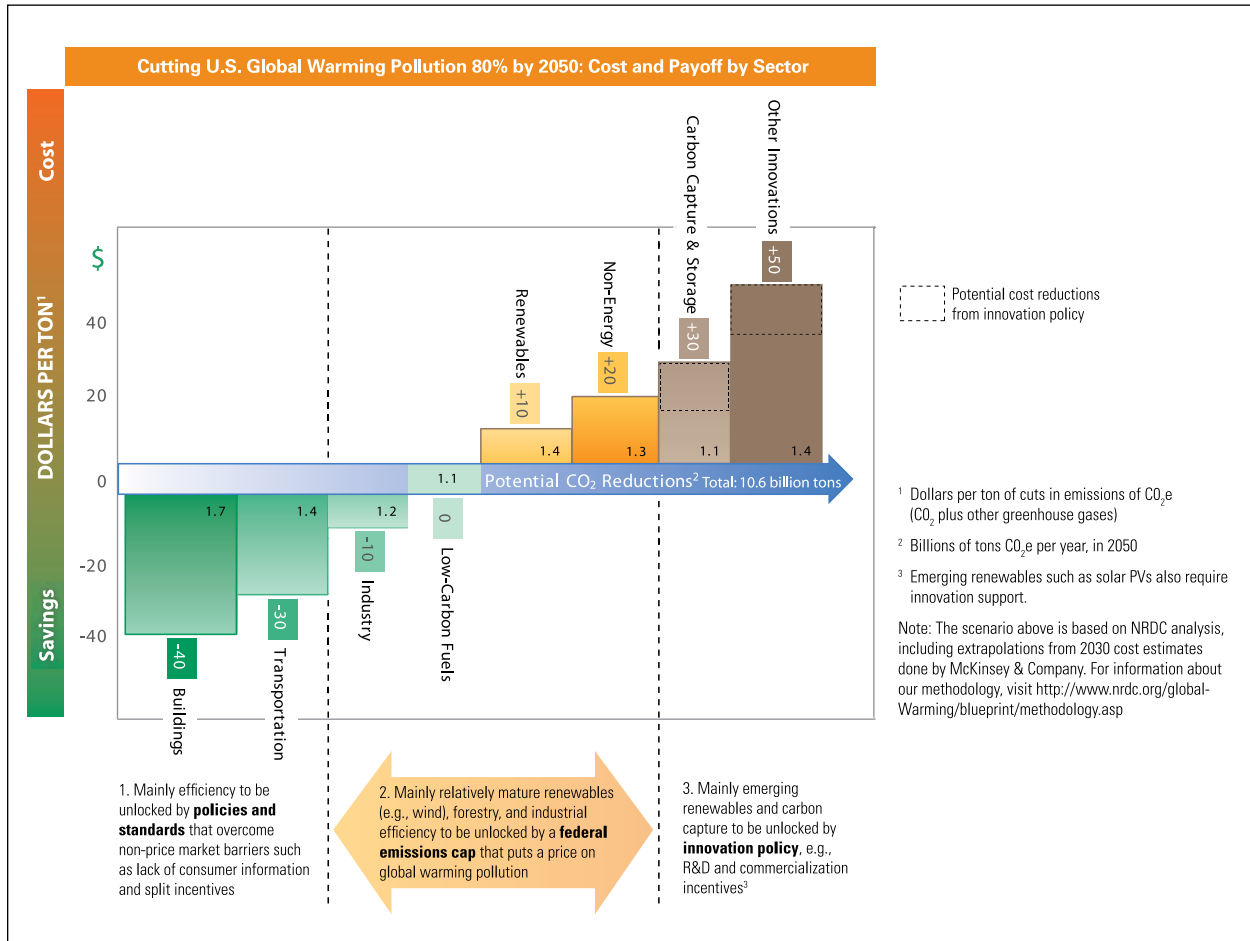


SOURCE: International Resources Group

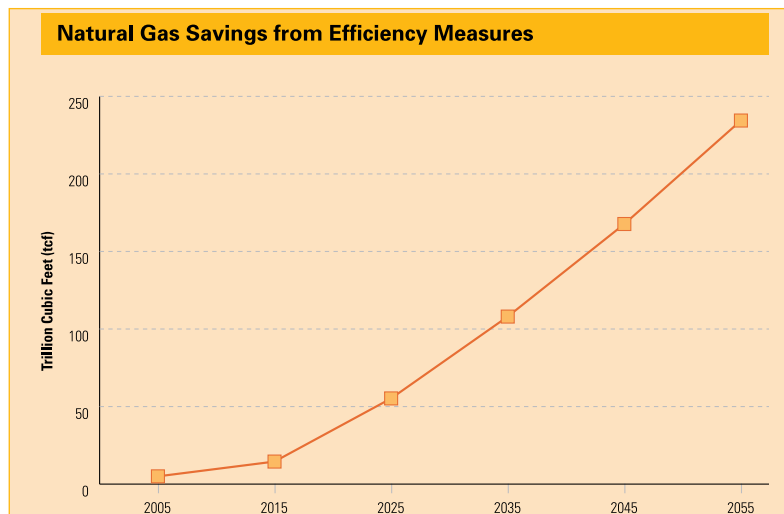
## Benefits of Efficiency and Renewable Energy

Investments in increasing the efficiency of how we use energy is a faster and more cost-effective way to meet future energy needs than increasing supplies. A recent study by the global consulting firm McKinsey and Company found that efficiency measures—gas, electricity, and vehicle efficiency—can reduce global warming pollution at a negative cost, that is, an actual cost savings.





For example, by focusing on heating and cooling our homes for less with more efficient furnaces and air conditioners, and getting our work done for less with more efficient office machines and buildings, we can take full advantage of natural gas as a clean-burning energy source while increasing our energy independence and building the clean energy economy. An analysis prepared for NRDC found that an aggressive efficiency program could cumulatively save more than 234 trillion cubic feet of natural gas over the next 50 years.<sup>6</sup>



## **Renewing Tax Incentives and Programs Proven to Increase U.S. Efficiency**

Tax incentives that promote energy efficiency in buildings, appliances, and equipment and accelerate the deployment of clean renewable energy technologies such as wind turbines, solar photovoltaic panels, and geothermal power plants are critical pieces of a successful long-term energy policy for America. The incentives reduce demand for natural gas and other fossil fuels and help to create new high-wage jobs.

Federal energy efficiency programs such as Energy Star, the State Energy Program, and the Building Energy Codes program are highly effective in promoting energy efficiency. According to the National Research Council, every dollar invested in seventeen Department of Energy research and development programs on energy efficiency returned \$20 to the U.S. economy.

A new Energy Star home saves an average of 30 percent of household heating and cooling energy use per year when compared with a non-Energy Star home. A builder that goes even further and constructs a home that uses 50 percent less energy qualifies for the federal energy efficiency tax credit. While few homes currently qualify for the federal tax credit, the number is growing rapidly, more than tripling from 2006 to 2007. The average homeowner of one of these energy efficient homes can save \$400 or more per year.

Unfortunately, important federal tax incentives for energy efficiency and renewable energy have either recently expired or will expire at the end of 2008. Extending these tax incentives will save 6 Tcf of natural gas during the first decade they are in place and will save 35 Tcf of gas by the end of the following decade.<sup>7</sup> These savings will amount to more than twice the amount of all the untapped federal gas resources believed to exist in the Uinta-Pieance Basin spreading across Utah and Colorado.<sup>8</sup> Congress must extend energy efficiency and renewable energy tax credits in order to provide the financial certainty necessary for investment in these areas to continue and grow. Given their ability to bring fantastic economic returns, Congress should increase the funding for these and other federal energy efficiency programs.

## **Realizing Nationwide Energy Savings Through Higher Efficiency Standards**

The Department of Energy (DOE) is scheduled to issue minimum energy efficiency performance standards for more than 30 types of power-thirsty appliances and equipment on which consumers and businesses depend. Ten of these standards were enacted in the Energy Independence and Security Act of 2007 late last year. The American Council for an Energy-Efficient Economy (ACEEE) estimates that these standards will save at least 1.6 percent of projected nationwide energy use annually by 2030 and reduce electricity demand by an amount equivalent to 110 medium-sized power plants (300 megawatts each). ACEEE estimates that standards scheduled to be set on 15 appliances not covered in 2007 have the potential to save a substantial amount of energy. The energy savings would be equivalent to 2 percent of projected residential and commercial sector U.S. electricity use, eliminating the need for 40 medium-sized power plants, and saving 340 billion cubic feet of direct natural gas in 2020. The gas savings alone are enough to meet the needs of 6.3 million typical households.

## **Fostering Growth of Renewable Energy Sources**

A National Renewable Electricity Standard requiring utilities to increase sales of power from renewable sources can significantly reduce carbon emissions from electricity generation without relying on increased use of natural gas. While more than 20 states now have such a standard, a federal standard would provide an equalized incentive in all parts of the

country. The Energy Information Administration estimates that requiring major electric companies to gradually increase sales of electricity from wind, solar, and other renewable sources to 10 percent by 2020 would save consumers more than \$22 billion. Such a renewable electricity standard would also create more than 90,000 jobs, foster rural economic development, and reduce emissions of global warming pollutants. NRDC advocates a renewable electricity standard of 25 percent, which would generate even greater benefits.

### **Educating the Public About the Value of Efficiency**

In addition to tax incentives, energy efficiency education campaigns can also reduce demand for natural gas and thus help keep prices down. California's Flex Your Power public-education campaign, which has received national and international recognition for excellence, provides a useful model. The campaign includes retail promotions, a comprehensive website, an electronic newsletter, educational materials, and advertising. The campaign has enjoyed success largely because there are financial incentives for energy efficiency and thus utilities actively promote the campaign.

## CHAPTER 4

# Conclusion and Policy Recommendations

America has large amounts of natural gas available right now. We do not need to sacrifice special areas such as the Catskills, the Arctic Refuge, the Rocky Mountain Front, the Wyoming Range, Utah's Redrock, or the California coast in order to increase domestic supplies. Increasing our energy efficiency is the fastest, cheapest way to lower the price of natural gas and reduce global warming pollution at the same time. We need an energy plan that taps into the cost reductions available from using less to do more. We can drive further for less with more efficient cars. We can heat and cool our homes for less with more efficient furnaces and air conditioners. We can get our work done for less with more efficient buildings and computers. Passing legislation to curb global warming and boost investments in efficiency and renewable energy sources is necessary to move our nation swiftly toward a future that is bright for future generations, the environment, and the economy.

### CAP CARBON EMISSIONS

- **Enact mandatory limits on global warming pollution to stimulate investments in efficiency and renewable energy.** A mandatory cap will guarantee that we meet emission targets and a well-designed program can reduce energy bills for consumers and businesses.

### INCREASE ENERGY EFFICIENCY

- **Extend tax incentives for energy efficiency and renewable energy.** These incentives, which promote energy efficiency in buildings, appliances, equipment, and other products and accelerate deployment of clean renewable energy technologies such as wind turbines, solar photovoltaic panels, and geothermal power plants have recently expired, or will expire at the end of 2008. These incentives not only reduce natural gas demand, but also help create new high-wage jobs, reduce global warming pollution, and save consumers and businesses on their energy bills. Extending these tax incentives will save 6 trillion cubic feet (Tcf) of natural gas in their first decade and save 35 Tcf of gas by the end of the second decade they are in place.<sup>1</sup>

- **Additional tax incentives for energy efficiency retrofits of existing homes.** Congress should pass the performance-based incentives for existing home retrofits contained in the Efficiency Incentives Act of 2007 (S. 822/H.R. 1385). This program will save 8 Tcf of natural gas in its first decade and 26 Tcf by the end of its second decade of operation.
- **Fully fund the Low-Income Home Energy Assistance Program (LIHEAP) and the Weatherization Assistance Program (WAP).** The Energy Policy Act of 2005 authorizes \$5.1 billion for LIHEAP and \$500 million for WAP. High energy bills hit low-income families especially hard. Unfortunately, the current administration requested that the WAP funding be eliminated. Congress should reject this request and fully fund both the WAP and LIHEAP authorizations.
- **Increase funding of federal energy efficiency programs.** Federal energy efficiency programs such as Energy Star, the State Energy Program, and the Building Energy Codes program are highly effective in promoting energy efficiency. According to the National Research Council, every dollar invested in seventeen Department of Energy research and development programs on energy efficiency returned \$20 to the U.S. economy. Congress should increase the funding for these and other federal energy efficiency programs.
- **Enact robust minimum energy efficiency performance standards for certain appliance and equipment products.** The Department of Energy is scheduled to issue minimum energy efficiency performance standards for more than 30 types of power-thirsty appliances and equipment on which consumers and businesses depend. Standards already included as part of the Energy Independence and Security Act of 2007 will save at least 1.6 percent of projected nationwide energy use annually by 2030 and reduce electricity demand by an amount equivalent to 110 medium-sized power plants. New standards for 15 appliances not covered in 2007 have the potential to save the equivalent of 2 percent of projected U.S. residential and commercial sector electricity consumption, eliminating the need for 40 medium-sized power plants, and saving 340 billion cubic feet of direct natural gas in 2020. The DOE must set standards that are sufficiently robust to achieve these potential savings.
- **Increase the energy efficiency standards of building codes.** Federal legislation should:
  1. establish targets for national model energy codes that increase efficiency levels for residential and commercial buildings 30 percent by 2010 and 50 percent by 2020;
  2. require states to adopt residential and commercial energy building codes that save at least as much energy as the national model codes;
  3. require that states achieve 90 percent compliance with their building codes within three years; and
  4. direct the Department of Energy to provide additional assistance to states with the development and implementation of higher efficiency codes.
- **Establish a nationwide energy efficiency education campaign.** A useful model is California's Flex Your Power public-education campaign, which has received national and international recognition for excellence. The campaign includes retail promotions, a comprehensive website, an electronic newsletter, educational materials, and advertising. The campaign has been successful because there are financial incentives for energy efficiency and the utilities actively promote the campaign.

## INCREASE DEVELOPMENT OF RENEWABLE ENERGY SOURCES

- **Congress should enact a national renewable electricity standard.** The Energy Information Administration has said that requiring major electric companies to gradually increase sales of electricity from wind, solar, and other renewable sources to 10 percent by 2020 would save consumers more than \$22 billion. Such a renewable portfolio standard would also create more than 90,000 jobs, foster rural economic development, and reduce emissions that cause global warming. NRDC advocates an a renewable electricity standard of 25 percent which would generate even greater benefits.

## IMPROVE ENVIRONMENTAL SAFEGUARDS

- **Federal agencies should ensure the use of best practices to protect air, water, land, human health, and property from harm due to natural gas exploration and production.** Minimizing the impact of drilling will reduce the controversy that surrounds it.

Practical recommendations include:

1. Offshore and onshore, produced water and other industrial waste should be reduced, reused, and recycled to the maximum extent possible.
2. Comprehensive site planning should be used to minimize the overall impact of operations, including protection of coastal wetlands and other sensitive habitats.
3. Noise and air pollution should be minimized using the best available technologies.
4. Spill detection and cleanup technology should be capable of addressing major spill events in a timely and effective manner.
5. Seismic exploration should be conducted in a manner that does not harm sensitive resources, including marine or terrestrial animals and habitat, as well as cultural and historic resources.
6. Surface disturbance and habitat fragmentation should be minimized.
7. Adequate reclamation standards should be imposed and enforced and reclamation bonds that cover actual reclamation costs should be required.
8. Effective inspection, enforcement, and monitoring should be implemented for all stages of construction and operation.
9. Available cost-effective measures for reducing environmental impacts and threats to human health and safety should be required rather than voluntary.

## ENDNOTES

### Chapter 1

- 1 See e.g. Save Roan Plateau Fact Sheet, July 7, 2004, [www.saveroanplateau.org/documents/oilandgasgeneralifs7.pdf](http://www.saveroanplateau.org/documents/oilandgasgeneralifs7.pdf).
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- 3 U.S. Department of Energy, *Coal Bed Methane Primer: New Source of Natural Gas Environmental Implications* (hereafter "DOE Primer"), February 2004, 45.
- 4 See e.g. TRC Environmental Corporation, *Air Quality Technical Support Document, Atlantic Rim Natural Gas Project and the Seminole Road Gas Development Project, Wyoming*, 45, July 2006, [http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/rfodocs/atlantic\\_rim/feis/volume\\_2.Par.70321.File.dat/08\\_appf.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/rfodocs/atlantic_rim/feis/volume_2.Par.70321.File.dat/08_appf.pdf). Gas dehydrators, condensate storage tanks and compressor stations emit hazardous air pollutants including benzene, toluene, xylene, and formaldehyde.
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- 7 Dustin Bleizeffer, "After 17 Months, Running Water," *Casper Star Tribune*, February 16, 2004. See also "Coal seam aquifers may have competing water rights and be diminished as CBM production increases," DOE Primer (supra note 3), 3.
- 8 Oil and Gas Accountability Project, *Pit Pollution*, May 2004, <http://www.earthworksaction.org/pubs/PitReport.pdf>.
- 9 Testimony of Steve Mobaldi before House Committee on Oversight and Government Reform, October 31, 2007, <http://oversight.house.gov/story.asp?ID=1576>. See also Testimony of Dr. Theo Colburn, President, The Endocrine Disruption Exchange and Testimony of Dr. Daniel Teitelbaum, President, Medical Toxicology and Occupational Medicine.
- 10 See generally National Research Council, *Oil in the Sea III: Inputs, Fates and Effects*, 2003; Minerals Management Service, *Outer Continental Shelf Oil and Gas Leasing Program: 2007-2012*, April 2007.
- 11 National Research Council, *Oil in the Sea III: Inputs, Fates and Effects*.
- 12 U.S. Environmental Protection Agency, *Profile of the Oil and Gas Extraction Industry*, October 2000, <http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/oilgas.pdf>.
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- 15 Amy Mall et al., *Drilling Down: Protecting Western Communities from the Health and Environmental Effects of Oil and Gas Production* (New York: Natural Resources Defense Council, 2007).

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- 1 Navigant Consulting, *North American Natural Gas Supply Assessment*, July 2008, [www.cleanskies.org/~media/Files/Navigant\\_Study/final\\_nci\\_study.ashx](http://www.cleanskies.org/~media/Files/Navigant_Study/final_nci_study.ashx).
- 2 Testimony of Aubrey McClendon before U.S. House Select Committee on Energy Independence and Global Warming, July 31, 2008, [http://globalwarming.house.gov/pubs/pubs?id=0051#main\\_content](http://globalwarming.house.gov/pubs/pubs?id=0051#main_content).
- 3 Energy Information Administration, *Natural Gas Gross Withdrawals and Production*, December 31, 2007, [http://tonto.eia.doe.gov/dnav/ng/ng\\_prod\\_sum\\_a\\_EPG0\\_FGG\\_mmcfa.htm](http://tonto.eia.doe.gov/dnav/ng/ng_prod_sum_a_EPG0_FGG_mmcfa.htm).
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- 5 EIA, *Dry Natural Gas Proved Reserves Summary*, December 31, 2007, [http://tonto.eia.doe.gov/dnav/ng/ng\\_enr\\_sum\\_a\\_epg0\\_r11\\_bcf\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_enr_sum_a_epg0_r11_bcf_a.htm).
- 6 BLM, *Inventory of Onshore Federal Oil and Natural Gas Resources and Restrictions to Their Development: Phase III* (hereafter "BLM Inventory 2008"), May 2008, xxvlii
- 7 The BLM has conducted three different inventories in the last five years of available federal oil and gas resources. See [www.blm.gov/epca](http://www.blm.gov/epca). The first inventory completed in 2003 concluded that 88 percent of natural gas resources in the Rocky Mountain region were available for leasing. The second inventory was completed in 2006. The BLM recently released its third inventory, which lowers the amount of available resources that the agency labels "available." This reduction is not the result of more land being withdrawn from leasing, but instead the result of a change in what BLM considers available. The 2008 analysis extends beyond the Rocky Mountain region to include Alaska and the Ventura Basin in California. Several problems plague the BLM's new analysis. For example, the new inventory lists lands undergoing land-use planning as off limits to drilling even though the BLM has been regularly leasing these lands during the land-use planning. Moreover, the inventory lists the entire National Petroleum Reserve-Alaska's Northeast Planning Area as "no leasing," yet 4 million acres of the 4.6 million-acre planning area are currently open for drilling.
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- 12 Id., Table 3-16.
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- 18 Id.
- 19 Gas in the ground in existing fields. The reserve numbers are calculated by the EIA. See EIA, *Dry Natural Gas Proved Reserves Summary*, December 31, 2007, [http://tonto.eia.doe.gov/dnav/ng/ng\\_enr\\_sum\\_a\\_epg0\\_r11\\_bcf\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_enr_sum_a_epg0_r11_bcf_a.htm).
- 20 The USGS calculates estimates of undiscovered resources for onshore oil and gas. See USGS, *National Assessment of Oil and Gas Resources Update*, November 2007. The Minerals Management Service produces similar estimates for offshore resources. See MMS, *Assessment of Undiscovered Technically Recoverable Oil and Gas Resources of the Nation's Outer Continental Shelf*, 2006, [www.mms.gov/revdiv/RedNatAssessment.htm](http://www.mms.gov/revdiv/RedNatAssessment.htm).



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- 23 BLM Inventory 2008, 232. Alaska untapped gas resources are limited to those on federal land. All other information regarding undiscovered resources comes from the USGS and includes private, state and federal land. USGS has analyzed only the Yukon Flats area of Central Alaska area and not the resources in either Northern Alaska or Southern Alaska.
- 24 BLM Inventory 2008, xxvii.
- 25 BLM Inventory 2008, 1.
- 26 See e.g. [www.blm.gov/rmp/wy/pinedale/documents/DEISFiles/Appendices/Appendix07\\_Lease\\_Stips\\_and\\_Term.pdf](http://www.blm.gov/rmp/wy/pinedale/documents/DEISFiles/Appendices/Appendix07_Lease_Stips_and_Term.pdf).
- 27 WildEarth Guardians, *No Rest for the Weary: Why Seasonal Oil & Gas Closures Aren't Protecting Wildlife in New Mexico*, 2007.
- 28 EIA, *U.S. Natural Gas Imports by Country*, March 30, 2008, [http://tonto.eia.doe.gov/dnav/ng/ng\\_move\\_imp\\_csl\\_a.htm](http://tonto.eia.doe.gov/dnav/ng/ng_move_imp_csl_a.htm).
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- 3 Id.
- 4 U.S. EPA, *Analysis of the Lieberman-Warner Climate Security Act of 2008*, March 14, 2008, [www.epa.gov/climatechange/downloads/s2191\\_EPA\\_Analysis.pdf](http://www.epa.gov/climatechange/downloads/s2191_EPA_Analysis.pdf).
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- 6 GDS Associates, Inc., *Achievable Cost Effective Natural Gas Savings in the United States Due to Adoption of Aggressive Energy Efficiency Policies and Programs*, June 22, 2006.
- 7 Analysis by the American Council for an Energy-Efficient Economy, [www.aceee.org](http://www.aceee.org).
- 8 BLM Inventory 2008, 156.

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