

A RESPONSIBLE ENERGY PLAN FOR AMERICA



THE EARTH'S BEST DEFENSE

Natural Resources Defense Council

April 2005

ABOUT NRDC

NRDC (Natural Resources Defense Council) is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has more than 1 million members and e-activists nationwide, served from offices in New York, Washington, Los Angeles and San Francisco. For more information, visit www.nrdc.org.

ACKNOWLEDGMENTS

The following NRDC staff members contributed to and reviewed this report: Ann Bordetsky, Sharon Buccino, Ralph Cavanagh, Chuck Clusen, Tom Cochran, Geoff Fettus, Barbara Finamore, David Goldstein, Nathanael Greene, Ashok Gupta, Dave Hawkins, Roland Hwang, Dan Lashof, Deron Lovaas, David McIntosh, Rob Perks, JingJing Qian, Lisa Speer, Luke Tonachel, Johanna Wald, John Walke, Rob Watson, and Greg Wetstone.

NRDC would like to thank our more than 600,000 members, without whom our work would not be possible.

Copyright 2005 by the Natural Resources Defense Council.

TABLE OF CONTENTS

Executive Summary	1
Chapter 1: Saving 2.5 Million Barrels of Oil a Day by 2015	5
Chapter 2: Providing America with Clean, Affordable Electricity	11
Chapter 3: Creating a Responsible Natural Gas Policy	17
Endnotes	21

EXECUTIVE SUMMARY

Reliable energy has helped propel America's impressive technological advances and comfortable way of life. Thanks to this ready supply, we can heat our homes and our businesses, power our computers and telephone systems, drive our automobiles and aircraft, and run our manufacturing plants and hospitals.

Yet America still depends on energy technologies of the past, and this dependence threatens our nation's economy, our health, and our security. We import nearly 60 percent of our oil, much of it from unstable regions in the world. We use oil in part to fuel cars and trucks whose average gas mileage is at its lowest in 20 years. Burning fossil fuels creates 70 percent of our electricity. Yet burning fossil fuels in our power plants, cars, and factories accounts for more than 60,000 premature deaths in the United States each year. And drilling for oil and gas industrializes some of our most prized wild places, denying future generations the last remnants of our natural heritage.

These wasteful, outdated approaches are contributing to the most urgent environmental and public health crisis of our time: global warming. Americans are already feeling the effects of intense heat waves, prolonged droughts, and rampant wildfires. Yet scientists predict that if we continue to burn fossil fuels unchecked, our children will face far more dangerous threats from coastal flooding, water shortages, and polluted air.

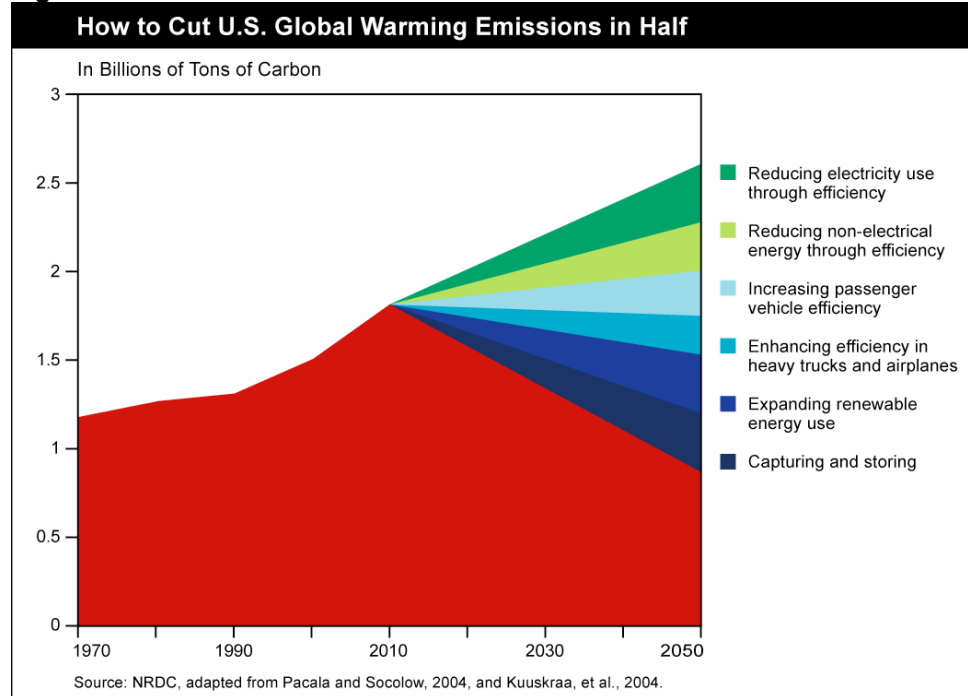
The good news is that solutions exist for curbing global warming and for supplying America with the energy we need to thrive. Using innovative, clean technologies available today, we can move beyond our reliance on dirty and unsafe energy sources and our dependence on unstable regions of the world. We can provide reliable transportation, comfortable buildings, and productive industry at the minimum cost to our society. Indeed, 21st century energy solutions can help America's economy prosper, secure our nation, increase jobs, and protect our health.

America has the vision, ingenuity, and ability to harness clean, efficient energy here at home, and NRDC has drafted a plan to realize this vision. With this plan, we can:

- Enhance our national security by reducing our dependence on oil
- Promote the use of cleaner energy resources that save money while reducing air and water pollution that threaten public health
- Exert American leadership in curbing global warming pollution
- Protect the public's wildlands and wildlife from destructive energy development
- Create jobs and support American farmers by investing in homegrown technologies and fuels.

Twenty-first century energy solutions can help America's economy prosper, secure our nation, increase jobs, and protect our health.

Figure 1



A PLAN TO SECURE AMERICA’S ENERGY FUTURE

The cornerstone of NRDC’s plan to secure America’s energy future is increased energy efficiency. Not only is energy efficiency free of environmental impacts, but it is also by far the cheapest way of meeting our energy needs. The efficiency improvements we recommend do not rely on pie-in-the-sky, undeveloped technologies, but on readily available and cost-effective processes that allow us to gain more productivity out of less energy. NRDC’s plans calls for the following steps:

1. Combat the global warming crisis by requiring caps on carbon dioxide emissions.

The largest and fastest growing sources of global warming pollution are power plants and cars and trucks, which account for almost three-fourths of total U.S. emissions. Technologies exist today to reduce global warming pollution by modernizing power plants, vehicles, and fuels. The challenge is ensuring these solutions are put in place. Congress should pass the McCain-Lieberman Climate Stewardship Act to create a comprehensive market-based program to press industry to embrace global warming solutions.¹ The act will set a cap on emissions from large carbon dioxide emitters in the electrical power sector, in addition to the industrial, commercial, and transportation fuel sectors. And it will create powerful incentives to minimize the cost of reducing pollution.

2. Commit to saving 2.5 million barrels of oil a day by 2015.

Congress should enact a national commitment to save at least 2.5 million barrels of oil per day in 2015 and 10 million barrels per day by 2025. Technologies exist today that can achieve these savings. We can put American manufacturers to work building the most energy-efficient cars and trucks, and we can put American farmers to work growing crops for new biofuels. We can save American consumers money by increasing the efficiency of our cars and trucks and strengthening smart growth policies. All of these steps will reduce dangerous air pollution, including emissions that cause global warming. Congress should set these savings in motion by enacting a national requirement to reduce our oil use by 2.5 million barrels per day.

3. Support and expand existing investments in energy efficiency.

The fastest, cleanest, and cheapest way for America to address its growing energy demand is through energy efficiency—getting more and better service using less energy. Thanks to readily available technology for improving heating and cooling systems in buildings and increasing the efficiency of everyday appliances, America can make dramatic cuts in energy use without sacrificing comfort or profitability. Indeed, the economic benefits of investing in efficiency measures typically outweigh costs by a ratio of 2 to 1. To tap this underutilized energy resource, NRDC is calling on Congress to enact the package of federal financial incentives and minimum standards for energy efficient products and buildings contained in the Snowe-Feinstein bill in the Senate and the Cunningham-Markey bill in the House.

Congress should set these oil savings in motion by enacting a national requirement to reduce our oil use by 2.5 million barrels per day.

4. Expand the role played by renewable energy supplies.

Clean energy such as wind, solar, and biomass provides electricity without damaging the environment or releasing dangerous air pollution. In order to ensure that all Americans can take advantage of these clean resources, NRDC endorses a federal renewable portfolio standard to require electricity providers to include a minimum level of clean energy resources in the electricity mix they deliver to their customers. We also recommend extending the renewable-energy production tax credit to keep renewables on their continued march to cost-competitiveness.

5. Reduce all major air pollutants from power plants.

Electric power plants are the single largest source of some of the worst air pollutants, including deadly particulate matter, acid-rain-forming sulfur dioxide, toxic mercury, and carbon dioxide, which causes global warming. Congress should pass a law to strengthen the Clean Air Act and to protect Americans from these harmful emissions, while at the same time providing electricity producers with certainty and flexible, enforceable compliance methods.

A PLAN THAT PROTECTS AMERICA'S NATURAL HERITAGE

We do not need to drill in our nation's most spectacular landscapes in order to meet America's energy needs. Focusing on drilling is a remnant of the past, one that fails to see that energy development in special wild places like Alaska's Arctic National Wildlife Refuge, Montana's Rocky Mountain Front, or Utah's Redrock Wilderness is not a solution to our energy problems. It's a distraction.

The solution will be found in American ingenuity, in investing in efficient vehicles, buildings, and appliances, and in relying more heavily on cleaner, renewable energy resources. For instance:

- Upgrading the quality of replacement tires to match that of tires that come as standard equipment on new cars would save 7.3 billion barrels of oil over the next 50 years. That's 35 percent more than the total amount of oil likely to be recovered from the Arctic Refuge over the same period.
- Ramping up fuel economy standards for passenger cars to an average of 40 miles per gallon over the next decade would save 60 billion barrels of oil over the next 50 years—more than 11 times the likely yield from the Arctic Refuge.

6. Do not drill for natural gas in sensitive offshore and onshore areas.

The vast majority of our offshore and onshore gas reserves are already open for leasing and development. Protecting a few remarkable pieces of America's natural heritage will neither harm the industry nor disrupt supply. Congress should protect fragile areas of the U.S. Outer Continental Shelf from the hazards of gas exploration and drilling. Likewise, Congress should protect several special places, including the Arctic National Wildlife Refuge, Teshekpuk Lake and Dease Inlet in the Western Arctic Reserve, Utah's redrock canyon country, New Mexico's Otero Mesa and Wyoming's Jack Morrow Hills.

CHAPTER ONE

SAVING 2.5 MILLION BARRELS OF OIL A DAY BY 2015

America's oil dependence endangers our national security, our economy, and our environment. America consumes a quarter of the world's total oil, but has less than 3 percent of its known reserves. We already import almost 60 percent of our oil, making us dangerously dependent on a precarious energy source to keep our economy moving. According to the Energy Information Administration, business as usual would lead to significant growth in U.S. consumption over the next two decades, forcing us to rely on imports for nearly 70 percent of our oil by 2025, and increasing our dependence on some of the most unstable regions in the world.²

A safer, more secure energy future is well within our reach. Technologies exist today that can reduce wasteful use of oil in vehicles, industry, and buildings, delivering savings of more than 3 million barrels per day by 2015—more oil than we currently import from the Persian Gulf each day. And by 2025, the United States could save at least 11 million barrels of oil per day, cutting our demand by 40 percent. We can reach these goals while enhancing the competitiveness of U.S. automakers and farmers by increasing efficiency standards for cars and trucks and by using tax incentives for biofuels and efficient vehicles to give new life to our factories and farms. Smart energy policies can reduce America's dependence on oil, stimulate our domestic economy, and help keep our nation safe.

To make this a national imperative, Congress should pass legislation requiring the country to cut oil use by at least 2.5 million barrels of oil a day by 2015 and 10 million barrels per day by 2025. These goals would not stretch to our full potential, but they would represent a very promising start. Industry leaders who remain tied to business as usual will claim that we can not achieve cuts of this size. But we can readily do it with the right investments in existing automobile technology, fuel economy, and alternative fuels. With a mandate from Congress to reduce our oil dependence, America can do the following:

Increase oil savings from our cars and trucks by raising fuel economy standards.

The single most important action the administration can take to reduce our country's oil dependence is to raise federal fuel economy standards. The Department of

Technologies exist today that can deliver savings of more than 3 million barrels per day by 2015—more oil than we currently import from the Persian Gulf each day.

Transportation should ramp up standards for the combined fleet of cars and light trucks in incremental steps to 40 mpg by 2015 and 55 mpg in 2025. Automakers can reach 40 mpg with improvements in conventional gasoline technology, and they can reach 55 mpg with expanded production of gasoline-electric hybrids. Indeed, America has already proven that such strides are possible. Fuel economy for new passenger cars nearly doubled between 1975—when standards were first adopted—and their peak in 1988, while fuel economy for new light trucks increased by 50 percent. But the rules for passenger cars haven’t changed since 1985, and the average mileage of our new cars and trucks today is at its lowest level in 20 years.

American ingenuity must once again be applied to making our vehicles more efficient. Raising fuel economy standards would save nearly 1.6 billion barrels of oil by 2015. Oil savings would keep growing as fuel economy standards continue to rise and new vehicles replace old ones. By 2025, oil savings would reach 4.9 million barrels per day—almost twice as much as we currently import from the Persian Gulf.

These fuel economy standards would also bring huge reductions in global warming pollution. By 2025, the pollution reduction they could achieve compared with business-as-usual would be more than 660 million metric tons of carbon dioxide emissions, reducing global warming pollution from passenger vehicles in that year by 35 percent.

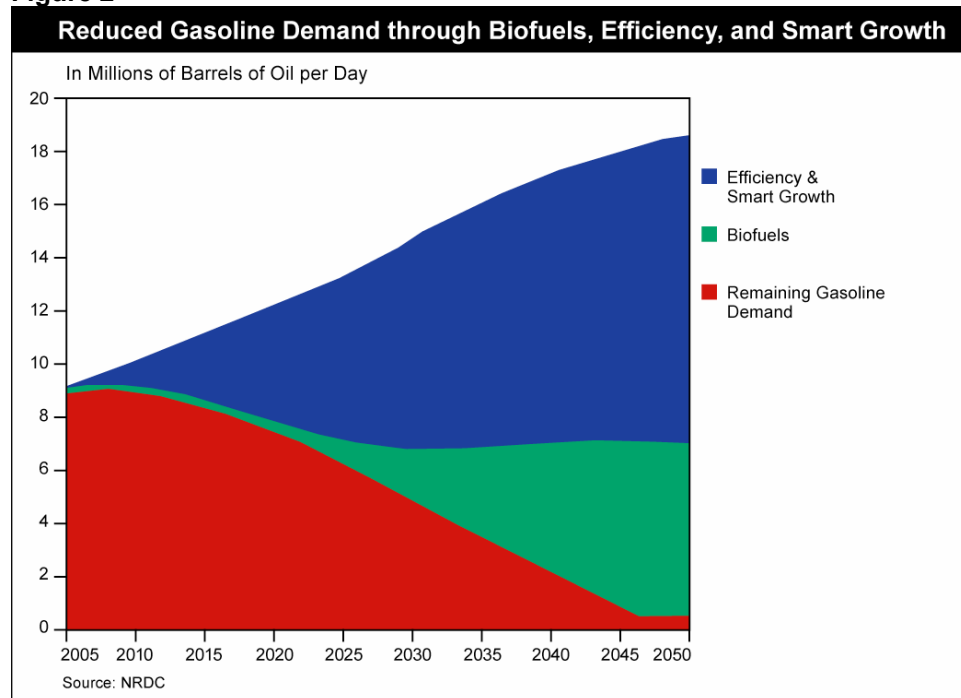
A recent study by the University of Michigan found that unless U.S. automakers move faster to build hybrids, thousands of jobs could be lost.

Enable manufacturers to ramp up production of hybrids and other fuel-efficient vehicles by offering tax credits for retooling factories.

As oil prices have risen, so has the demand for fuel-efficient cars and trucks, especially hybrids. But the “Big Three” automakers, General Motors, Ford, and DaimlerChrysler, have been slow to get into the hybrid market. As a result, they are losing the race for market share in clean and efficient vehicles and failing to improve their fleets’ overall fuel economy. A recent study by the University of Michigan found that unless U.S. automakers move faster to build hybrids, thousands of jobs could be lost.³ And if they continue their business-as-usual stance, the Big Three will face a significant competitive disadvantage in the global auto market over the next few decades.⁴ Putting American innovation to work can reverse this course, saving jobs and saving oil.

Producing fuel-efficient, advanced-technology vehicles will require automakers and their suppliers to retool their factories. Hybrid vehicles rely on advanced equipment such as battery packs, electric motors and generators, and electronic power controllers—components that currently come from factories in Japan and Europe. Tax credits would help manufacturers make capital investments necessary to retool their factories, increase the cost-effectiveness of advanced technologies, and stimulate job growth in the production of cleaner, more efficient vehicles. NRDC recommends that Congress provide a total of \$3 billion over the next five to 10 years in consumer and manufacturer tax credits to spur these changes. These tax credits will not only help reduce oil dependence but will also pay for themselves through increased tax revenue from new economic activity, including new jobs in the production of high-efficiency vehicles.⁵

Figure 2



Make biofuels cost-competitive with gasoline and diesel by investing about \$2 billion over 10 years in research, development, demonstration, and deployment.

The United States does not have to rely so heavily on oil to drive our economy and maintain our quality of life. We can replace much of our oil with biofuels—fuels made from plant materials grown by American farmers. These fuels, especially those known as cellulosic biofuels, can be cost-competitive with gasoline and diesel, and allow us to invest our energy dollars at home. They can also slash global warming emissions, improve air quality, reduce soil erosion, and expand wildlife habitat. In combination with efficiency improvements and smart growth policies:

- By 2025, producing the crops to make biofuels could provide farmers with profits of more than \$5 billion per year.
- Biofuels could be cheaper than gasoline and diesel, saving Americans about \$20 billion per year on fuel costs by 2050.
- Biofuels could reduce U.S. greenhouse gas emissions by 1.7 billion tons per year by 2050—equal to more than 80 percent of transportation-related emissions and 22 percent of total emissions in 2002.

The biofuel feedstock with the potential to displace the largest amount of oil is cellulosic biomass, which includes agricultural residue—the leaves, stems, and stalks of plants, dedicated energy crops, and the biomass portion of the municipal waste stream. Making fuel from cellulosic biomass offers numerous advantages. The technology for

converting cellulose to biofuels is expected to be cost-competitive with petroleum-based fuels when it is mature. Cellulosic biomass crops, such as switchgrass, have the potential to produce more biomass per acre than almost any other crop. Switchgrass also requires lower inputs of energy, fertilizer, pesticide, and herbicide, and is accompanied by less erosion and improved soil fertility compared with traditional row crops.

Gasoline blended with low levels of ethanol creates air pollution problems in today's on-road cars. But vehicles running on higher biofuel blends are cleaner, since the biofuels contain no sulfur, produce low carbon monoxide, particulate, and toxic emissions, and avoid more than a ton of greenhouse gas emissions for every ton of biomass used to make biofuels. To expand the market for higher biofuel blends, NRDC recommends requiring that at least half of all new cars and trucks to be capable of operating both on gas and on biofuels or other nonpetroleum fuels by 2012. With the right policies in place, biofuels could contribute the equivalent of 7.9 million barrels of oil per day by 2050, or 53 percent of our current demand in the transportation sector.⁶

Enhance the efficiency of all vehicles by requiring better replacement tires, motor oil, and trucking practices.

Several common-sense solutions exist right now that would improve fuel economy in the cars and trucks on our roads today. Manufacturers simply need incentives to make these solutions more readily available to consumers. By pressing manufactures to upgrade the quality of replacement tires to match the quality of original equipment tires, the United States would save 7.3 billion barrels of oil over the next 50 years—or 35 percent more than the total amount of oil that is likely to be available from the Arctic National Wildlife Refuge over the same time period. Like better replacement tires, more efficient motor oil can provide fuel savings as well. According to the U.S. Department of Energy, the use of specifically formulated low-friction motor oil can increase fuel economy by 1 percent to 2 percent.⁷ A producer of synthetic motor oil has projected that fuel economy benefits could be as much as 5 percent.⁸

Heavy-duty trucks would also benefit from efficiency standards. These trucks account for roughly 20 percent of transportation energy use but do not have to follow any standards for fuel efficiency. The American Council for an Energy-Efficient Economy has found that we could improve the fuel efficiency of trucks by up to 70 percent with cost-effective measures. The heaviest long-range trucks can increase fuel economy through conventional technology, including enhancing aerodynamics, lowering rolling resistance in tires, improving engine fuel injection and thermal management, and reducing vehicle weight. Medium-size, short-haul trucks can also achieve large fuel economy advances through hybrid gasoline-electric or diesel-electric drivetrains. And we can further stretch the fuel efficiency of heavy trucks and reap air quality benefits by reducing the tremendous amount of fuel used during idling.

Expand efficiency programs that help reduce industrial and residential oil use.

Approximately one-third of U.S. oil demand is consumed in industrial manufacturing plants, residential buildings, and airplanes. By making efficiency gains in these areas, we can save more than 300,000 barrels per day in 2015, or 12 percent of our national target of 2.5 million barrels per day in savings. To achieve these oil savings, we should expand industrial efficiency programs. Improving the efficiency of industrial boilers and process heating alone can reduce oil consumption by 15 percent by 2020.

The manufacture of chemicals and industrial materials consumes four times the amount of oil used for heating. But the industrial sector can cut oil use by replacing petroleum-based feedstocks with materials derived from crops, which are already used to produce solvents, pharmaceuticals, adhesives, detergents, inks, paints, plastics, and other products.

Today, approximately 8 million homes continue to burn fuel oil, liquefied petroleum gases, propane, or kerosene for space and water heating. The United States should promote residential oil savings by adopting stringent efficiency standards for house and apartment building boilers and furnaces, adopting performance-based tax incentives for home retrofits and for efficient water heaters, and updating codes for new buildings. Together these measures could save 100,000 barrels of oil per day in 2015.

Encourage smart growth instead of suburban sprawl.

Thanks to suburban sprawl, Americans' vehicle use has more than tripled in the last three decades. People are logging more miles and using more gasoline just to do their daily activities. Smart-growth communities—ones that offer walkable neighborhoods, housing near jobs, and public transportation—can help residents save gas and time behind the wheel. Environmental Protection Agency research shows that residents of a smart-growth development in Atlanta use half the transportation energy of those in a typical sprawling development. Building better communities holds immense potential for generating oil savings. If all new construction over the next 10 years were built in a similar fashion to existing smart-growth developments, the nation could achieve oil savings of more than half a million barrels of oil per day.

Congress has taken initial steps to support smart growth and better transportation choices, but much more must be done. To achieve greater oil savings and pollution reductions, the federal government should take these additional steps:

- Require Freddie Mac and Fannie Mae to offer Location Efficient Mortgages® throughout the country to reward those who build and buy homes located near public transit, and to offer dollar-for-dollar trade-offs between lower transportation costs and higher housing costs.
- Promote commuter choice with a tax-free benefit for employees who carpool, use transit, bike to work, or telecommute comparable to that provided in the form of free parking.

Environmental Protection Agency research shows that residents of a smart growth development in Atlanta use half the transportation energy of those in a typical sprawling development.

- Cut the red tape and streamline financing for public transportation projects that significantly increase mobility of commuters and other public-transportation-dependent populations and promote economic development in urban “transit-oriented development zones.”
- Promote economic development in areas with existing access to mass transit through urban “transit-oriented development zones.”
- Direct federal agencies to revise their planning models so that they account for the financial and air quality benefits of smart growth.

PROVIDING AMERICA WITH CLEAN, AFFORDABLE ELECTRICITY

America's complex electricity generation system keeps our economy vital, powering our technological advances, industrial activity, medical research, and business transactions. Yet electricity generation also poses serious problems. Electricity production today typically involves burning fossil fuels using inherently polluting processes. Burning coal accounts for 51 percent of the nation's electricity. Electric power plants are the single largest source of some of the worst air pollutants, including deadly particulate matter, acid-rain-forming sulfur dioxide, and toxic mercury. They are also the single largest emitters of global warming pollution in the United States. Finally, the current structure of the electricity marketplace makes consumers vulnerable to price spikes and market-driven shortages.

America does not have to fall prey to these problems. Cleaner sources of electricity available today can power our economy and preserve our health and environment. A comprehensive energy policy for the electricity sector can and must:

Pass the McCain-Lieberman Climate Stewardship Act to cap and reduce carbon dioxide emissions—the chief cause of global warming.

The electricity industry is the largest source of global warming pollution in the United States—40 percent of U.S. carbon dioxide emissions come from electric power generation. While energy efficiency measures will avoid a portion of our growing electricity demand, we still need to make electricity generation cleaner. The good news is that technologies exist today to modernize power plants and reduce global warming pollution. The challenge is to ensure these solutions are put to use. Some coal industry holdouts have gotten in the way of progress by ignoring the problem of global warming completely or by lobbying for polluter-friendly voluntary programs to reduce carbon dioxide emissions. Voluntary programs are simply not working. Many companies in the United States have participated in a range of voluntary efforts to reduce global warming pollution over the past 10 years, yet U.S. emissions have increased 14 percent since 1990.

Only binding limits on global warming emissions will create the market structure needed to allow competitive businesses to go beyond cosmetic steps to reduce emissions. The Climate Stewardship Act would create a comprehensive market-based program to

The good news is that technologies exist today to modernize power plants and reduce global warming pollution.

cut heat-trapping pollution from all major U.S. sources, including power plants. It would set a cap on emissions of greenhouse gases from large carbon dioxide emitters in the electric power, industrial, commercial, and transportation fuel sectors—which together account for more than three-quarters of U.S. global warming pollution. The nation could achieve these reductions without hurting American pocketbooks. An MIT economic analysis finds that meeting the Climate Stewardship Act emission limits would affect household purchasing power by less than one-tenth of 1 percent.

Provide a package of tax incentives for advanced energy-efficient buildings and appliances.

The fastest, cleanest, and cheapest way for America to address its growing energy demand is through energy efficiency—getting more productivity using less energy. Thanks to readily available technology for improving heating and cooling systems in buildings and increasing the efficiency of everyday appliances, America can make dramatic cuts in energy use without sacrificing comfort or profitability. Indeed, the economic benefits of investing in efficiency measures typically outweigh costs by a ratio of 2 to 1. And the good news is that we can reap these benefits faster than by building new power plants. New efficiency measures will start delivering savings in a matter of months. By 2015, the Snowe-Feinstein bill's package of federal tax incentives and consensus standards for efficiency could achieve the following:

- Save 8 percent of total annual electricity use
- Save 10 percent of total projected natural gas use
- Reduce heat-trapping carbon dioxide emissions by an amount equal to almost 25 percent of the overall reduction that would be needed to comply with the McCain-Lieberman Climate Stewardship Act.
- Generate 600,000 new jobs in the production and installation of efficient equipment and in the additional economic activity generated by businesses that saved on energy costs.

Energy efficiency incentives have had remarkable success at the state level. It is time for the entire nation to reap these benefits. NRDC recommends a package of federal financial incentives and consensus standards for energy efficient products and buildings. Tax benefits for commercial and residential buildings would produce dramatic savings of 30 percent to 50 percent of annual energy costs. Incentives for highly energy efficient products, such as air conditioners and ceiling fans, would be based on the product's performance, not cost, in order to foster competition between suppliers. These product incentives would bring almost immediate energy savings. Similar programs operated by utilities show that manufacturers can respond to incentives with a lead time of only a few months, passing savings on to consumers in less than a year.

Establish a federal "portfolio standard" to ensure that renewable energy steadily increases its long-term market share at minimum cost.

More than half of U.S. electricity in the United States is currently generated by burning coal—releasing air pollutants that cause acid rain, smog, and cardiopulmonary health problems. Electricity generation using fossil fuels is also the single largest source of global warming pollution. In contrast, renewable energy such as wind, solar, and geothermal can provide electricity with far less damage to the environment and our health.

A federal renewables portfolio standard will ensure that all Americans can take advantage of these clean resources. A portfolio standard requires electricity providers to include a percentage of clean energy resources in the electricity mix they deliver to their customers. And since renewable energy resources have become increasingly cost competitive, portfolio standards help bring consumers clean energy at affordable rates. In 2004, New York adopted a portfolio standard requiring 24 percent of the state's electricity to come from renewable resources by 2013. The state expects that the effect on consumers will range from a 1.2 percent drop to a 1.8 percent increase in energy costs. For instance, if a consumer's monthly electric bill is \$50, the bill would fluctuate by only 75 cents or a dollar. Eighteen states and the District of Columbia already require power companies to produce a percentage of electricity from renewable sources; it is now time for a federal policy.

Extend the renewable-energy-production tax credit, which provides a crucial short-term boost for renewable energy sources.

In addition to reducing air pollution, renewable energy also adds much-needed diversity to the nation's electricity mix, improving reliability, dampening fuel price shocks, and contributing to economic development. These benefits become available at a rapid pace: the construction time for renewable generation facilities is measured in months, not years as with conventional sources.

The renewable-energy-production tax credit is helping expand the role that renewables play in America's electricity market. The production tax credit was designed to spur the use of technologies that are on the verge of economic competitiveness. As a performance-based incentive, it rewards companies only when renewable energy is delivered to the power grid. Since the production credit was introduced in 1992, installed wind capacity has grown more than 400 percent. Yet despite the obvious benefits, the incentive has been allowed to expire twice. It has been granted short-term extensions, but the uncertain future of the tax credit leaves developers without the financing certainty they need to expand production capacity and make commitments to future projects. NRDC recommends extending the production tax credit for five years and expanding it to include geothermal energy. This extension will keep renewables on their continued march to cost competitiveness.

Create financial incentives to develop carbon capture technology for coal plant emissions.

In addition to reducing air pollution, renewable energy also adds much-needed diversity to the nation's electricity mix, improving reliability and dampening fuel price shocks.

Energy efficiency and renewable energy resources form the core of a successful strategy to keep global warming emissions from spiraling out of control. But even as these resources expand, the International Energy Agency forecasts that nearly 1,400 gigawatts of new coal capacity will be constructed worldwide between now and 2030. This is equivalent to almost 2,800 large power plants. If all of these plants were built using conventional technology, the plants' lifetime emissions would equal half the total estimated carbon dioxide caused by all fossil fuel use over the past 250 years. Unless we act today to adopt new ways to use coal, our children will be threatened by this massive increase in global warming pollution.

Existing technology allows new coal plants to capture and store carbon dioxide emissions in geological repositories. But the power sector is adopting this technology far

CHINA'S AMBITIOUS ENERGY SAVINGS PLAN

Thanks to its booming economy, China's emissions of heat-trapping carbon dioxide are growing rapidly. China currently generates 80 percent of its electricity from burning coal, and its growing oil dependence now makes it the second largest importer of oil after the United States. But China is taking aggressive steps to improve its energy use.

- Starting on July 1, 2005, China will impose its first ever minimum fuel economy standards for new cars and trucks. China's first foray into fuel economy standards is already more stringent than those in the United States, where fuel economy standards for passenger cars have not changed since 1985. While American standards are based on fleet averages—manufacturers can sell cars that get below the minimum gas mileage requirement as long as they also sell cars that exceed the requirement—in China, the minimum fuel economy standards will apply to every single vehicle. The first phase of Chinese standards for cars will be too high for some American models to meet, while the second phase of Chinese standards for 2008 would cause many more American models to fail. The Chinese requirements for SUVs and minivans are more rigorous. More than half of current U.S. SUV models would fail the Chinese standards that will take effect in 2006, and 90 percent would fail the Chinese standards for 2009.
- In February 2005, China passed a national Renewable Energy Law. The law is expected to help China meet 10 percent of commercial energy consumption through renewable sources such as wind, solar, and biomass by 2020, and includes strict penalties for noncompliance. The United States has no national renewable energy law, although some states have passed their own renewable portfolio standards.
- In June 2004, China declared energy efficiency as one of its three national energy priorities. In response, China's most powerful government agency, the National Development and Reform Commission, issued a detailed national energy conservation plan in January 2005 that will save the equivalent of 1.4 billion tons of coal by 2020. That is more than the total planned increase in energy production during the same period.

too slowly to avert dangerous carbon dioxide levels in the atmosphere. We need policy action to put this new technology in place at the required pace. First, Congress must pass binding limits on carbon dioxide emissions to give power plants the signal that the time has come for investing in carbon capture. Second, the federal government needs to create financial incentives to optimize and bring down the costs of today's carbon capture systems. The current policy approach of an extended—and expensive—research program will not give us significant results fast enough. Instead, Congress needs to give the private sector the business rationale for prioritizing investment in carbon capture today.

Establish comprehensive limits on air pollution from power plants covering emissions of nitrogen, sulfur, mercury, and carbon dioxide.

In addition to creating the lion's share of U.S. global warming emissions, coal-fired electric power plants are the single largest source of some of the worst air pollutants, including sulfur dioxide and mercury. Although progress has been made cleaning up air pollution since the Clean Air Act was passed in 1970, air quality has remained poor or has even deteriorated in many parts of the country. The Environmental Protection Agency estimates that approximately 159 million Americans live in areas where the air is unhealthy. From the aggravation of respiratory problems such as asthma and emphysema to premature death, air pollution takes a toll on Americans' health. It also harms the environment, causing acid rain, ozone damage to trees and crops, mercury contamination, and global warming.

Despite the air pollution dangers facing Americans, the nation's biggest electric power polluters are pushing for a plan that would delay and dilute pollution reductions required by the current Clean Air Act. NRDC supports power plant legislation, but only if it strengthens the Clean Air Act, protects Americans from breathing dangerous pollutants better than current law, and imposes mandatory limits on carbon pollution from power plants to address the urgent problem of global warming—all while providing electricity producers certainty and flexible, enforceable compliance methods. NRDC supports the pending Clean Power Act and Clean Smokestacks Act in Congress because they:

- Reduce sulfur and nitrogen emissions from power plants, saving tens of thousands of lives and avoiding millions of illnesses
- Preserve the current Clean Air Act's mandate to cut toxic mercury emissions that threaten pregnant women, developing fetuses, and children
- Curb acid rain and clear smog from our parks, forests, lakes, and streams
- Use market mechanisms, known as emissions trading, to reduce sulfur, nitrogen, and carbon pollution nationally, while maintaining essential safeguards to protect air quality locally and regionally.

Congress needs to give the private sector the business rationale for prioritizing investment in carbon capture today.

Reject additional subsidies for a mature and wholly uncompetitive nuclear power industry.

Nuclear power is a poor candidate for further public subsidies. It is a mature power technology with tens of billions of dollars in public and private capital already behind it. It is saddled with proliferation risks and a costly, long-lived hazardous waste burden. No energy generation company in the United States has been willing to order and construct a new nuclear plant in more than 30 years. This is not because of public opposition over safety or national security concerns. Rather, it is because new commercial nuclear power plants are uneconomical in the United States—they simply cannot compete with other sources of electricity. According to an MIT study, the levelized cost of electricity generated by a new nuclear plant is estimated to be about 60 percent greater than the cost of electricity from a coal plant or a gas-fueled plant, assuming moderate gas prices.⁹ Faced with these marketplace realities, some of the largest and most successful energy companies are chasing taxpayer dollars to subsidize the difference in the cost of nuclear and fossil-fueled generated electricity.

NRDC believes that the nuclear power industry should fend for itself in the free market—without additional taxpayer assistance. This mature industry has already benefited from decades of government subsidies. If the government were to subsidize six more nuclear plants, we would have 110 nuclear plants instead of 104 nuclear plants. This would not make nuclear power competitive or solve any of the nation's pressing long-term energy needs and global warming emissions targets. Nor would it address the serious outstanding problems that face the nuclear industry, such as the risk of proliferation and nuclear terrorism at home and abroad, reactor safety, and the environmental harms caused by mining uranium and disposing nuclear waste at such inadequately designed sites as Yucca Mountain. These problems need to be solved before expanding our commitment to nuclear power.

CREATING A RESPONSIBLE NATURAL GAS POLICY

Natural gas is used in a variety of ways, including as a source for heating, as fuel for electricity generation, and even as a power source for buses and other motor vehicles. It is the cleanest burning fossil fuel, particularly when modern equipment is used. But as with other fossil fuels, extracting and burning natural gas causes various forms of pollution. Natural gas is not sufficiently clean to be considered the long-term answer to America's energy needs, but it can act as a bridge to greater reliance on cleaner and renewable forms of energy.

Growing demand and sharp increases in short-term natural gas prices in 2004 have prompted some to call for more drilling on public lands and fewer environmental safeguards on gas exploration and use. Yet sacrificing our natural heritage and circumventing public participation in energy plans on public lands are simply not necessary in order to power our economy and homes.

The best way to reduce our economy's vulnerability to high natural gas prices is to waste less gas. The energy efficiency tax incentives laid out in the electricity section of this report would save more than 3 trillion cubic feet of natural gas annually when fully phased in, or more than 10 percent of national consumption. Simply by issuing new efficiency standards for commercial air conditioners, residential furnaces and boilers, and electric distribution transformers, America would save 6.4 trillion cubic feet of natural gas over the next 20 years.

Even with efficiency measures in place, however, America will continue to need natural gas. To ensure that natural gas is obtained in the safest and most sustainable way, America must take the following steps:

Do not drill in sensitive offshore areas, including moratorium areas, Alaska, and the eastern Gulf of Mexico.

According to the most recent Department of Interior assessment, 80 percent of economically recoverable gas reserves in offshore areas are now open to development. Only a portion of America's most important national coastal treasures—from Big Sur to the Florida Keys and Alaska's Bristol Bay—has been afforded federal protection. Other special places could be added to this list without undermining the natural gas industry or increasing prices for consumers.

Natural gas is not sufficiently clean to be considered the long-term answer to America's energy needs, but it can act as a bridge to greater reliance on renewable forms of energy.

These protections are critical to saving our most sensitive marine ecosystems from the damaging consequences of drilling. Extracting oil or gas from beneath the ocean floor creates massive amounts of waste, including toxic metals and other contaminants, most of which is dumped untreated into surrounding waters. Offshore seismic exploration causes noise pollution harmful to whales and other marine mammals that depend on sound to communicate. Offshore development also brings with it the risk of toxic oil spills, which in turn threaten a wide variety of marine species. And every well drilled generates tons of air pollutants. Congress should protect fragile areas of the U.S. Outer Continental Shelf, including waters off the East and West coasts, the eastern Gulf of Mexico, and offshore Alaska from the hazards of exploration and drilling.

Maintain existing protections for sensitive onshore public lands and extend protection to other special places.

Developing natural gas onshore can turn wildlands into industrialized zones. Well fields can cover thousands of acres and encompass hundreds, even thousands, of wells and drill pads. Each field is accompanied by a dense web of power lines, miles of pipelines and roads, waste pits, compressors, processing plants, and other production facilities. These activities degrade wildlife habitat, harm fragile soils, and encourage damaging off-road vehicle use.

Natural gas production on some public lands will continue to be necessary and should always be done in an environmentally responsible manner. But certain areas within the federal public lands system merit special protection from gas development. The energy production industry and its champions in Washington claim that these safeguards interrupt supply and cause price spikes. Yet according to a January 2003 report by the Interior, Energy, and Agriculture departments, only 12 percent of “technically recoverable” federal gas resources in the five major Western basins are totally off-limits to leasing and development—and most of that 12 percent is in lands that Congress has designated as wilderness and national parks.

Protecting a few more remarkable pieces of America’s natural heritage will not disrupt the industry. In fact, the industry is having trouble keeping up with the leases it already has: almost 73 percent of the total onshore acreage under oil and gas leases from the Bureau of Land Management is not in production. In the Rocky Mountains alone, only 32 percent of lands leased for gas drilling are in production. And more than half of the record number of drilling permits approved by the bureau in FY 2004 went unused. Congress could designate more sensitive areas off-limits to drilling without harming the natural gas industry or consumers’ pocketbooks. NRDC recommends that Congress permanently protect several special places, including the Arctic National Wildlife Refuge, Utah’s redrock canyon country, and Wyoming’s Jack Morrow Hills in the heart of the Red Desert.

Almost 73 percent of the total onshore acreage under oil and gas leases from the Bureau of Land Management is not in production.

Ensure that pipelines are constructed in an environmentally sensitive and safe manner.

Natural gas pipelines can significantly alter the landscape. To construct them, builders often carve networks of new roads through forests or coastal areas and dig miles and miles of trenches to lay the pipeline. Once in operation, pipelines have to be closely monitored to avoid dangerous leaks: pipelines are highly explosive and have been responsible for several deaths.

To minimize the impacts of natural gas pipelines, the federal government should issue rigorous siting and safety guidelines. Pipelines should not be routed through national parks, wildlife refuges, or wilderness areas. New pipelines should follow current rights-of-way whenever possible to take advantage of existing infrastructure and to avoid damaging sensitive wild places with pipeline construction or inadequate maintenance. For example, NRDC strongly opposes a pipeline that would carry Prudhoe Bay gas that goes “over the top” offshore from the Arctic National Wildlife Refuge in Alaska to the MacKenzie Delta in the Northwest Territories in Canada. Instead, the natural gas pipeline should follow the existing Trans-Alaska Pipeline System and the Alaskan Highway. Finally, Congress should ensure that pipelines are safely maintained once they are in operation by providing adequate funding for inspection and enforcement.

Plan an Alaska gas pipeline to deliver Prudhoe Bay gas to the lower 48 states that follows the Trans-Alaska Pipeline System and the Alaskan Highway.

In Alaska’s Prudhoe Bay region, geologic formations already drilled on state-owned lands contain at least 35 trillion feet of natural gas—equivalent to about one-fifth of all U.S. proved reserves, or slightly less than two years’ worth of nationwide consumption at current levels. A pipeline route linking these reserves to the U.S.–Canadian gas transmission system was approved almost 20 years ago, although it has not yet been constructed. According to the original plan, the pipeline would use existing rights-of-way and run parallel to Alaska’s principal oil pipeline and the Alaskan Highway.

NRDC does not oppose construction of this system, as long as the earlier environmental reviews are updated according to U.S. and Canadian regulations and the project incorporates the best pipeline environmental and safety measures.

Ensure that infrastructure for liquefied natural gas imports follow careful siting guidelines, and that imports do not come from environmentally sensitive areas or from countries without adequate environmental safeguards.

Liquefied natural gas (LNG) is natural gas that has been cooled to 261 degrees Fahrenheit below zero, reducing the volume of the gas 600-fold. Specially designed tankers can carry more than 2.5 billion cubic feet of gas per shipment, delivering LNG from around the globe to one of four U.S. marine terminals. Proposals have surfaced for at least 16 more import facilities to serve the U.S. market. But LNG facilities have very

Pipelines should not be routed through national parks, wildlife refuges, or wilderness areas.

challenging siting requirements. LNG tankers are massive: they can only dock in harbors wide enough to allow the 900-foot-long tankers and deep enough to handle their 36-foot draft below the waterline. Extensive local opposition to LNG terminals and U.S. Coast Guard restrictions on LNG tanker movement further limit possible sites for new LNG facilities.

With careful siting, LNG can offer a valuable substitute for more environmentally destructive fuels. But increased use of LNG must not become a means for shifting natural gas exploration and extraction to especially sensitive areas, or to nations lacking adequate environmental and public-health safeguards. And all LNG siting decisions must analyze potential environmental and safety impacts and allow the public to participate in decision making. New facilities should also avoid marine sanctuaries, marine protected areas, and fragile resources like deep corals.

ENDNOTES

- ¹ The McCain-Lieberman Climate Stewardship Act, S. 342.
- ² Energy Information Administration, *Annual Energy Outlook 2004: With Projections to 2025*, DOE/EIA-0383(2004), Table 21, January 2004.
- ³ Patrick Hammet, , Michael Flynn, Maitreya Kathleen Sims, and Daniel Luria, *Fuel-Saving Technologies and Facility Conversion: Costs, Benefits, and Incentives*, A report to the National Commission on Energy Policy and the Michigan Environmental Council, University of Michigan Transportation Research Institute, November 2004.
- ⁴ Duncan Austin, Niki Rosinski, Amanda Sauer, Colin Le Duc, *Changing Drivers*, World Resources Institute, Sustainable Asset Management (SAM), 2003.
- ⁵ National Commission on Energy Policy, *Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges*, December 2004.
- ⁶ See NRDC, *Growing Energy: How Biofuels Can Help End America's Oil Dependence*, December 2004.
- ⁷ U.S. Department of Energy, "Gas Mileage Tips: Keeping Your Car in Shape," available on the fuel economy website: www.fueleconomy.gov/feg/maintain.shtml, Viewed August 23, 2004.
- ⁸ AMSOIL INC, "The Right Environmental Choice," product brochure for 100 percent synthetic oil, Superior, WI, 2003.
- ⁹ "The levelized cost is the constant real wholesale price of electricity that meets a private investor's financing cost, debt repayment, income tax, and associated cash flow constraints," from John Deutch, Ernest J. Moniz, et. al., *The Future of Nuclear Power*, Massachusetts Institute of Technology, 2003, p.38. The report is available online at <http://web.mit.edu/nuclearpower/>.

Source for Figure 1: S. Pacala and R. Socolow, "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies," *Science* 2004, 305: 968-972; and Vello Kuuskraa, Phil DiPietro, Scott Klara, and Sarah Forbes, "Future U.S. Greenhouse Gas Emission Reduction Scenarios, Consistent with Atmospheric Stabilization of Concentrations," presented at the Greenhouse Gas Technologies-7 Conference, in Vancouver, BC, 2004.