Meeting America's Energy Needs Through the 21st Century

by Samuel W. Bodman
11th Secretary of Energy of the United States

For most of our history, Americans have been blessed with ample sources of domestic energy. Seemingly endless forests supplied wood in all its various uses for the early colonists. Coal (which burns more cleanly than wood, people often forget) exists in the United States in such abundance that it is, for all effective purposes, limitless. And from 1859, when the first oil well was drilled in Titusville, Pennsylvania, until just a few decades ago, the United States was a net exporter of petroleum.

Our vibrant domestic energy industry is a major part of the story of how America built the greatest economy in the history of the world. Oil and coal fueled the factories that launched the modern American economy in the Gilded Age. Refined petroleum propelled it through the automotive revolution ignited by Henry Ford, and supported the industrialization during World War II that made America a global superpower. In the post-war years, natural gas and nuclear power plants have added to our energy mix, supplying gigawatts of electricity – that compact, efficient and indispensable power source of the new digital era.

Today, as with commerce and communications, our energy sector is part of a global network. That network is dominated by oil, because while we can make light and heat – and therefore electricity – from many sources, petroleum is virtually the only fuel for the rapidly expanding transportation sector. So it is a potent fact that ever since U.S. oil production peaked in mid 1990s, we have been depending more and more on imports. In fact, 56 percent of the oil we use

today comes from abroad, and it's projected that we will be importing 68 percent by 2025.

That means that an increasing percentage of the oil revenue that had been coming into the U.S. economy for so many years is now flowing to other countries. In addition, some experts say the world is running out of oil. We know we have depleted much of the known supply in the lower 48 states.

Even as we seek to develop truly transformative energy sources, such as hydrogen or nuclear fusion, we must recognize that this is a long-term project.

All of this means two things. First, we need to find ways to reduce our dependency on foreign oil by increasing our domestic supply and by controlling the growth in our oil consumption through greater efficiency. Second, we need to push ahead with finding ways to move beyond the petroleum-based economy altogether, by developing alternative energy sources that are not only cheaper and more abundant, but also better for the environment.

Even as we seek to develop truly transformative energy sources, such as hydrogen or nuclear fusion, we must recognize that this is a long-term project. The United States is not going to eliminate the need for oil overnight. That is why we need to increase domestic production by exploring for oil and gas in new places, such as offshore areas and on certain federal lands – including a small corner of the vast Arctic National Wildlife Refuge in Alaska.

Advances in exploration and drilling technology now allow us to find and extract oil and gas with much less environmental impact than ever before. This technology would allow production in ANWR, for example, using a tract of land no larger than a mid-sized city airport.

Closely related to the oil situation is the challenge of adequate natural gas supplies. As a primary home heating and industrial fuel source, as well as an industrial feedstock, natural gas is critically important. But over the last few years, we have seen supplies tighten, largely because it has become the fuel of choice for new power plants.

As with oil, the United States once produced all its gas domestically. Today, however, we import substantial quantities. This has prompted increasing calls for exploration in new areas, for building new processing and transportation infrastructure, and for boosting our capacity to import liquefied natural gas (LNG). Storing and transporting natural gas in liquefied form has enormous potential for meeting our natural gas needs. That is why

President Bush has instructed the Federal Energy Regulatory Commission to expedite the permitting process in order to bring much-needed LNG into this country.

Unlike our stores of oil and gas, the United States has enormous reserves of coal. But coal – to a greater extent than other fossil fuels – has environmental problems that must be addressed if we are to continue taking advantage of its abundance. We have made good progress with coal – mining it and burning it with much less environmental impact. It's one of the reasons that, since the 1970s, our economy has more than doubled while air pollution has declined by 54 percent. Under the President's clean coal technology programs, we are working with industry to develop ways to burn coal even more efficiently, while capturing and removing both pollutants and greenhouse gas emissions.

Clean coal technology is the focus of one of the most exciting projects currently under way at the Department of Energy. This project, called FutureGen, is a $950 million initiative to build the world's first coal-fired electricity generating plant that emits no pollution. Through a process called carbon sequestration, FutureGen would also capture and store the greenhouse gas emissions that many scientists believe are responsible for global warming. And, in addition, FutureGen would produce hydrogen; to be used in the new fuel cell technologies we are developing to replace petroleum in the automotive sector.

As we continue to find ways to use fossil fuels as efficiently and cleanly as possible, the Bush Administration is also working to expand the use of nuclear power, which already produces about 20 percent of America's electricity. The United States hasn't started construction of a new nuclear plant since the 1970s, even though nuclear energy is the only technology we currently have to reliably produce large amounts of electricity with no pollution or greenhouse gas emissions at all.

The Department of Energy has several initiatives under way to develop the next generation of safe nuclear reactors. At the center of these efforts is the President's Nuclear Power 2010 program, which is working to ensure that

We have made good progress with coal – mining it and burning it with much less environmental impact.

our nation is ready to resume nuclear plant construction by the end of this decade. Nuclear Power 2010 involves the government and the private sector working closely together to complete and certify the most advanced nuclear power plant designs available, and demonstrate the Nuclear Regulatory Commission's one-step licensing process. These steps are crucial to reducing the business risks associated with building new nuclear power plants in the United States.

President Bush has further proposed that the government provide risk insurance to help give investors confidence that regulatory delays will not turn a good project into a bad investment. Instead of giving out financial incentives, we are proposing to improve the government's permitting and regulatory system itself. We believe that by doing so, the government will start encouraging and stop impeding the construction of facilities we believe to be economically viable. We also are pursuing plans to build a permanent repository for commercial nuclear waste, which the government has been promising the utility industry for years.

But as we pursue all these new forms and sources of energy it's important to keep in mind that our most accessible source of new energy might be the energy we currently waste. The average American home loses between 10 and 50 percent of its energy through inefficient lighting and appliances, as well inadequate home insulation. Schools, stores, factories, and office buildings don't do much better.

The Department of Energy is working to improve efficiency on several fronts, including: encouraging homeowners to choose Energy Star rated homes and appliances; educating consumers about more fuel efficient vehicles; and helping plant managers understand that new technologies and procedures on the factory floor can save energy and improve the company balance sheet at the same time.

The fact is, we have a variety of energy-saving technologies that are ready for the market. More efficient homes, vehicles and technologies are already here. Some suggest that we use new regulations, codes and standards to push these technologies into the market. Others say we should simply encourage changes in consumer behavior. Actually, we need to do both, and we will seek to strike the proper balance as we seek to reduce energy demand, improve the environment, and help all sectors of the economy save money on energy.

In the end, however, I believe that the key to our long-term energy future rests with a young engineer, chemist, physicist, or even biologist, pursuing scientific research that will yield energy sources not even imagined today. That is why, as an engineer and student of science myself, I am especially proud that the Department of Energy is the principal government sponsor of basic research in the physical sciences. In fact, our world-class National Laboratories have helped the Department of Energy garner more than 80 Nobel Prizes through the years.

Some of the research we sponsor is pursued simply to advance the frontiers of human understanding – although, as history has repeatedly shown, knowledge pursued for its own sake can yield tremendous practical achievements. Still, a large number of our scientific projects are specifically focused on developing solutions to real-world problems, and are conducted in cooperation with major research universities and private industry. I believe one of the most essential contributions we can make is to foster innovative, creative, and commercially promising new developments in science and technology wherever possible, which will ultimately lead us into an entirely new age of clean, affordable and abundant energy.

This spring, I had the honor of delivering my first college commencement address at the Georgia Institute of Technology. I noted there that imagination has always been the fuel that has propelled technology forward. Imagination inspired the early humans who invented the wheel. It inspired a math professor named Galileo, who built his first telescope at one of the world's oldest research universities in Padua, Italy. It inspired the Wright Brothers' airplane, and Edison's light bulb… and it inspires the technologies of today. Albert Einstein once said, "Imagination is more important than knowledge. Knowledge is limited, but imagination encircles the world."I believe the power of imagination, along with the practical, inventive, optimistic spirit of the American people, will not only meet the energy challenges we face today, but transcend them. In fact, I believe that one hundred years from now, our grandchildren will look back with bemusement at the ways we find, develop and use energy, which will seem to them as quaint and primitive as a kerosene lamp or an early Model-T seems to us. But for that to happen we must continue investing in the most advanced technologies, encouraging the most promising scientific research, and working aggressively to address our energy challenges today. In doing so, President Bush and I believe that we can leave a cleaner, better, more prosperous world for generations to come.

Samuel Wright Bodman was sworn in as the 11th Secretary of Energy on February 1, 2005 after the United States Senate unanimously confirmed him on January 31, 2005. He leads the Department of Energy with a budget in excess of $23 billion and over 100,000 federal and contractor employees.

Previously, Secretary Bodman served as Deputy Secretary of the Treasury beginning in February 2004. He also served the Bush Administration as the Deputy Secretary of the Department of Commerce beginning in 2001. A financier and executive by trade, with three decades of experience in the private sector, Secretary Bodman was well suited to manage the day-to-day operations of both of these cabinet agencies.

Born in 1938 in Chicago, he graduated in 1961 with a B.S. in chemical engineering from Cornell University. In 1965, he completed his Sc.D. at Massachusetts Institute of Technology.