

Nuclear Renaissance?

Many are looking at nuclear energy as a solution to our energy needs and foreign oil dependency.

BY LINDA SIKKEMA AND MELISSA SAVAGE

The first nuclear reactor, in 1951, produced enough electric power from splitting the atom to illuminate four light bulbs. Today, 103 commercial nuclear power plants in 31 states produce approximately 20 percent of the electricity used in the United States. And that percent-

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age is going to grow. Thirty new reactors are in some phase of the planning process. Many say we are entering a nuclear renaissance.

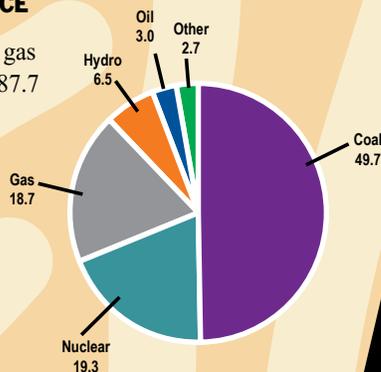
“Nuclear is the future for energy,” says New Mexico Representative John Heaton, “and we need to incorporate it into the national energy policy as quickly as possible.”

The increasing interest in nuclear power is underscored by the fact that George W. Bush is the most pro-nuclear power president in two decades. He cautioned against U.S. dependency on foreign energy in his State of the

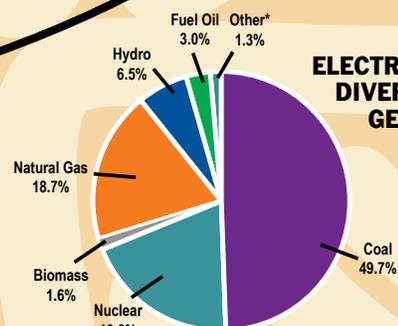
Union Address this year and last. In 2006, the president introduced the Advanced Energy Initiative, which among other things, sets up a Global Nuclear Energy Partnership under the Department of Energy. It is intended to not only reduce America’s dependence on foreign fossil fuels, but also to encourage emissions-free nuclear energy worldwide. DOE is seeking to develop new technologies to recycle nuclear fuel, minimize waste and improve our ability to keep nuclear materials out of the hands of terrorists.

U.S. ELECTRICITY GENERATION BY FUEL SOURCE

Coal, nuclear and gas together produce 87.7 percent of U.S. electricity.



ELECTRIC COMPANIES USE A DIVERSE MIX OF FUELS TO GENERATE ELECTRICITY



* “Other” includes generation by agricultural waste, batteries, chemicals, geothermal, hydrogen, landfill gas recovery, municipal solid waste, non-wood waste, pitch, purchased steam, solar, sulfur, wind and wood.

Source: U.S. Department of Energy Energy Information Administration (EIA), 2005 data.

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A WORLDWIDE SOLUTION?

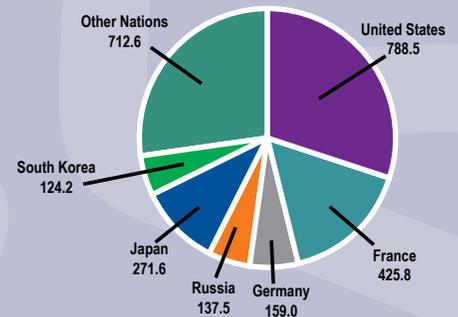
Thirty countries, including the United States, operate more than 440 nuclear power reactors, producing 16 percent of the world's electricity. There are 29 new nuclear power plants under construction in 12 countries and 30 being proposed in the United States. Other countries are investing in nuclear power because they see it as an efficient, clean and cheap way to provide power to their citizens. France generates almost 80 percent of its electricity from nuclear power. Lithuania is close behind at nearly 70 percent. Slovakia, Belgium, Ukraine, Sweden, Republic of Korea, Bulgaria and Slovenia all generate about 50 percent of their electricity needs from nuclear power. In total, 16 countries rely on nuclear energy to supply at least one-quarter of their total electricity.

—Brice Kindred, NCSL



ELECTRICITY GENERATION, 2004 (BILLION KILOWATT HOURS)

The United States produces more electricity than any other nation.



The Energy Policy Act of 2005 (EPACT) authorizes money for the Nuclear Power 2010 program. EPACT also included a number of incentives for nuclear facilities including loan guarantees for low-emission energy production technology like nuclear power.

The Nuclear Power 2010 program brings together government and industry to identify sites for new nuclear power plants, develop standards for plant designs and promote a streamlined regulatory process. To help

further this process, the Standby Support program—part of the Nuclear Power 2010 program—helps plants adopt new reactor designs by shepherding them through the often complicated regulatory and litigation process.

In this country the resurgence of nuclear power focuses primarily on the licensing of new facilities and to a much lesser degree on the reactor design. In the United States it is cheaper to produce new fuel rods and dispose of the old. Other countries, however, view spent fuel as a resource and not waste. France, England, Russia and Japan all recycle—or reprocess—their spent fuel rods to get the most out of them and to cut down on dangerous waste.

DOE's partnership project is designed to leverage new technology to effectively and safely recycle spent nuclear fuel without

producing separated plutonium. The idea is to extract more energy from nuclear fuel, reduce the amount of waste that requires permanent disposal, and greatly reduce the risk of nuclear proliferation.

IMPROVEMENTS HAVE BEEN MADE

Not all agree that nuclear energy is America's answer to foreign energy dependency. Many point to radioactive disasters like Three Mile Island and Chernobyl as reasons to look to other sources of energy. And while Three Mile Island was the most serious nuclear accident in the United States to date, no radiation escaped from the containment building. Several positive changes resulted, including improved safety systems and new industrywide regulations.

Most do agree, however, that meeting the current and future energy needs in the United



REPRESENTATIVE
JOHN HEATON
NEW MEXICO

COAL

the Good and the Bad



With rising demand for energy in the United States and abroad, countries have put a premium on abundant and affordable sources of energy. Access to large deposits of coal spread out across the United States has made it the primary source of energy in the country, and has spurred economic growth and improvements in our standard of living. By 2030, coal is expected to account for 48 percent of the world's electric power as more nations continue to develop advanced economies, increasing the demand for these affordable and plentiful resources.

The widespread use of coal for energy generation across the world, however, has had detrimental effects. Emissions from coal combustion have been among the leading sources of air pollution in the United States. Burning of coal releases carbon dioxide and other gasses linked to climate change, as well as nitrogen oxide and sulfur dioxide, which can be toxic to humans and lead to acid rain. While work is being done to make coal cleaner and more efficient, energy resources that harm the environment less, including renewable and nuclear fuels, have become attractive alternatives. The major pollutants emitted by traditional coal-burning power plants are carbon dioxide; sulfur dioxide, which contributes to acid rain; hydrocarbons, which form toxic ozone; and mercury, which contaminates lakes and rivers.

—Brice Kindred, NCSL



States is approaching a crisis. Our demand for energy is expected to jump by 50 percent in the next 25 years. Some experts say the United States will have to import 65 percent of its oil and 30 percent of its gas by 2015. Domestically, fuels will get harder to get to and be located far from where they are needed. A limited foreign oil supply and competition from growing needs in China and India will make it more difficult and more expensive to depend on foreign imports. At the same time, there is an increasing demand for clean energy. States are implementing stricter environmental and air quality standards and the federal government is expected to do the same.

Nuclear energy is a possible solution to this growing dilemma. As a clean energy source, it meets environmental standards. It is cheaper than coal. Development costs for a nuclear plant are less than that of a coal plant. Thirty-one states have already incorporated nuclear power into their energy portfolios and have been able to safely meet energy demand for

consumers. Arizona, Vermont, New Jersey, South Carolina, Connecticut and Illinois use it the most.

The Palo Verde Nuclear Generating Station in Arizona generates more electricity annually than any other U.S. power plant of any kind, including coal, oil, natural gas and hydro. The three-unit, 3,875-megawatt nuclear plant produced 25.8 million megawatt-hours of electricity in 2005, enough for 4 million homes.

Vermont, in 2005, generated the greatest percentage—72 percent—of its electricity from nuclear energy of any state. New Jersey and South Carolina generated more than half of their electricity from nuclear energy. Connecticut and Illinois are around the 50 percent mark.

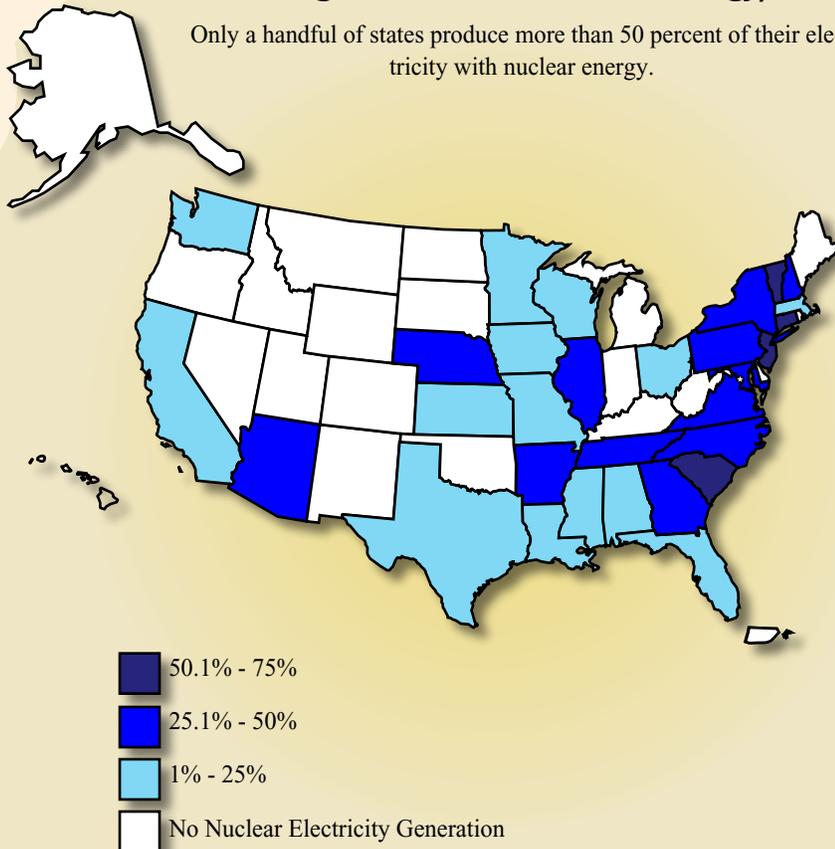
NUCLEAR ENERGY

Why is nuclear power so popular? For starters, of all energy sources nuclear power has the lowest impact on the environment, including water, land, habitat, species and air resources. Nuclear energy also is eco-effi-



Percentage of Nuclear Generated Energy, 2005

Only a handful of states produce more than 50 percent of their electricity with nuclear energy.



cient—producing the most electricity in relation to its environmental impact.

Nuclear energy is the world’s largest source of emission-free energy. It produces no controlled air pollutants, such as sulfur and particulates, or greenhouse gases. The use of nuclear energy in place of other energy sources helps keep the air clean, preserve the Earth’s climate, avoid ground-level ozone formation and prevent acid rain. In 2005, U.S. nuclear power plants prevented 3.32 million tons of sulfur dioxide, 1.05 million tons of nitrogen oxide, and 681.9 million metric tons of carbon dioxide from entering the earth’s atmosphere.

Nuclear power plants were responsible for more than a third of the total voluntary reductions in greenhouse gas emissions reported by U.S. companies in 2004 (the last year available), according to the Energy Information Administration. Emissions reductions from using nuclear energy amounted to 143 million metric tons of carbon dioxide, 36 percent

of the 391 million metric tons of total carbon dioxide equivalent reductions reported.

TROUBLE IN PARADISE?

While nuclear generators don’t emit pollutants, they do have the potential to leak radiation. Vermont claims that the Vermont Yankee power plant has exceeded the state’s radiation emission limits three times since 1998. The company believes emissions are within the range. The Vermont Department of Health is looking at the current measurements used to assess emission levels and will go to the Legislature if changes are necessary.



REPRESENTATIVE
SARAH EDWARDS
VERMONT

Vermont Representative Sarah Edwards pays close attention to her state’s use of nuclear power and remains “concerned that we are continuing to go forward without having a viable solution to the buildup of high level nuclear waste.”

Nuclear reactors produce radioactive waste. The facilities, however, work hard to ensure that the waste is carefully contained, packaged and safely stored. Spent fuel generated from the production of electricity is currently stored onsite at nuclear power plants. Congress has approved Yucca Mountain, Nev., as a geologic repository for the nation’s high-level waste and spent nuclear fuel, but it is not expected to be opened until 2020. According to the Department of Energy, Yucca Mountain will accommodate all the used commercial nuclear fuel that ever has been or will be generated by the country’s nuclear power plants.

With Yucca Mountain on the horizon, waste storage problems could be solved. Still, many are still fighting the project. Some question the placement of the site and whether it will ever meet all that is promised. Many in Nevada question the placement of the repository because almost all present reactor sites are in the East, which means transporting dangerous waste across the country. They also are not convinced of the scientific suitability of Yucca Mountain. Regardless, Representative Edwards believes energy policies should not contribute to what she views as a problem. “The less waste we have to find a place for, the better.”

THE BOTTOM LINE

While there continues to be some disagreement over the safety of nuclear power, the energy issues facing the United States are genuine. Energy experts agree that the United States needs to find a balanced mix of resources to lessen dependency on foreign oil. For many the direction is clear: nuclear-generated power.

“If becoming independent from foreign oil truly is a national priority, we need to begin developing alternatives that will reduce our reliance on other nations,” says New Mexico’s Representative Heaton. “Over the next 50 years, the gap between projected energy demand, and projected energy production in the United States will need to be bridged. In order to remain competitive in the global economy, we will have to find a way to fill in this shortfall.”