

# Insight

JULY 2008



*Nuclear energy's resurgence will mean "tens of thousands of high-paying jobs," Christine Todd Whitman said while launching a new CASEnergy initiative.*

## Coalition Highlights Jobs Potential

Congressional leaders, former governors, the academic community and local leaders joined forces last month to launch a new initiative by the Clean and Safe Energy (CASEnergy) Coalition to draw attention to the dramatic job growth opportunities projected in the U.S. nuclear energy industry.

"A renewed focus on nuclear energy will translate into tens of thousands of high-paying American jobs needed to build and operate new reactors," said former New Jersey Gov. Christine Todd Whitman, CASEnergy Coalition co-chair. The group's white paper, "Job Creation in the Nuclear Renaissance," focuses on the economic opportunities created by the industry's resurgence. The industry needs a highly skilled work force to operate the country's 104 reactors as well as build and operate new nuclear power plants.

Depending on construction methods used, new-plant construction could provide as many as 4,000 workers per project at the peak periods. Once in operation, each new nuclear reactor will provide anywhere from 400 to 700 permanent jobs, the CASEnergy white paper reported.

Sen. Tom Carper (D-Del.) emphasized that the country has a large pool of talent from which to secure new nuclear professionals. "Congress must provide support and incentives to the nuclear industry to help redevelop its work force, facilities and capacity, which in turn can restore our lead in safe, efficient nuclear manufacturing, while creating tens of thousands of highly skilled jobs," Carper said.

"We must continue to support the expansion of

*Jobs on page 3*

## Presidential Candidates Set Energy Policies

With gasoline prices topping \$4 per gallon and climate change concerns informing policymaker and public discussions, energy issues are infusing the presidential campaign debate.

The two presumptive nominees, Sen. John McCain (R-Ariz.) and Sen. Barack Obama (D-Ill.), have addressed energy issues frequently during the past few weeks, expressing support for nuclear power to varying degrees.

In a series of energy speeches last month, McCain said that if elected president, he would set the United States on a course to build 45 new nuclear reactors by 2030, with an ultimate goal of 100 new reactors.

"This task will be as difficult as it is necessary," McCain said. "We will need to recover all the knowledge and skills that have been lost over three stagnant decades in a highly technical field."

During a campaign stop in Nevada last month, Obama said he would not take nuclear power "off the table" as an energy option.

Obama said he favors increased research into nuclear waste storage and recycling, but that the United States should not build more reactors until the disposal of used fuel is resolved.

"If we can figure that out effectively, then nuclear has some big advantages—the fact that it doesn't release greenhouse gases being the most important," he told a group of "green"

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Candidates from page 1

industry workers in Las Vegas.

For McCain, nuclear power represents a means of achieving a clean, abundant and secure energy supply. In one speech, he noted that China, Russia and India have ambitious plans to include nuclear power in their energy portfolios. "If all of these nations can find a way to carry out great goals in energy policy, then I assure you that the United States is more than equal to the challenge," he said.

He did not give a timeline for the goal of 100 new reactors. Other challenges to meeting this goal include addressing manufacturing deficiencies and used fuel management issues, McCain said.

"We need a fresh start as well to meet America's growing electricity needs," he added. "And if we're looking for a vast supply of reliable and low-cost electricity—with zero carbon emissions and long-term price stability—that's the working definition of nuclear energy."

In his online position paper on energy, Obama said that nuclear power represents more than 70 percent of U.S. noncarbon-generated electricity. "It is unlikely that we can meet our aggressive climate goals if we eliminate nuclear power from the table," the paper stated. "However, there is no future for expanded nuclear without first addressing four key issues: public right-to-know, security of nuclear fuel and waste, waste storage, and proliferation."

During a May 5 appearance on "Meet the Press," Obama said, "I think we do have to look at nuclear, and what we've got to figure out is can we store the material properly? Can we make sure that they're secure? Can we deal with the expense?"

... My attitude when it comes to energy is there's no silver bullet. We've got to look at every possible option."



PHOTO COURTESY OF KANSAS STATE UNIVERSITY

The research reactor at Kansas State University was undamaged when a tornado blew through the campus causing minor damage to the building housing the reactor.

## Nuclear Power Plants Weather Storms

When a series of tornados and floods struck the nation's mid-section last month, nuclear facilities performed exactly as designed—safely and securely.

Tornados blew through the nation's heartland in mid-June, damaging homes and buildings. The building housing Kansas State University's TRIGA Mark II research reactor sustained only minor damage during one storm, but the reactor itself was undamaged.

University officials had previously shut down the reactor following a scheduled experiment. "I can assure you that modern technology is employed and that our reactor facility is designed to be inherently safe and secure," said Ken Shultis, professor of mechanical and nuclear engineering and a member of the reactor safeguards committee.

In Iowa, flooding in the state caused billions of dollars in damage and forced thousands to evacuate their homes. However, Florida Power and Light Co.'s Duane Arnold nuclear power plant in Palo, Iowa, continued to operate at 100 percent power.

The floods, however, knocked out three forms of telecommunication at the plant: commercial telephone lines, the federal telephone system and the microwave communication system. Nevertheless, communications with the U.S. Nuclear Regulatory Commission and other local,

state and federal agencies were maintained using satellite and cellular phones.

The NRC sent staff to the Duane Arnold plant in Iowa and Kansas State University to ensure both facilities responded properly to the effects of the storms and flooding.

The agency uses a classification scale for events that could affect nuclear power plants. The scale ensures consistency in communications. The scale's four categories are:

- notification of unusual event
- alert
- site area emergency
- general emergency.

Even though the flood and tornado caused tremendous damage to the surrounding area, the disasters prompted an unusual event and an alert from the Iowa and Kansas reactors, respectively. These are classifications at the lower end of the federal scale.

An unusual event is the lowest classification and means there was a minor event, with no radiation release expected. An alert means there is an actual or potential reduction in plant safety; however, no radiation is released. Typically, only three or four alerts are declared in a year's time at the nation's nuclear power plants.

# Polls Find Strong Support for New U.S. Nuclear Plants

A pair of public opinion surveys finds strong support for the construction of new nuclear power plants in the United States.

A Zogby Interactive survey in May showed that 67 percent of Americans favor building nuclear power plants, with nearly half of the 2,925 nationwide participants indicating a strong interest.

Eighty-five percent of Republicans and 70 percent of Independents supported construction, while slightly less than half of Democrats surveyed agreed. When asked which plant they would prefer in their community, Republicans and Independents selected nuclear plants over coal-, natural gas- or oil-fired plants.

Republicans and Independents also were more likely than Democrats to support construction of a new plant in their own community.

The survey concluded that Americans over age 24 were much more likely to select nuclear energy as the source for electricity. Twenty-seven percent of participants 18 to 24 years of age were in favor of nuclear power. The group with the greatest support was those of age 65 and older. Of that



group, more than three-quarters endorsed nuclear power.

Americans also believe that nuclear power should receive the highest level of financial support from the government, followed by solar and wind energy. Almost half of Republicans agreed with the federal funding priority given to nuclear energy, while slightly more than 10 percent of Democrats believe nuclear should receive the most support.

The online survey, conducted May 20-22, has a margin of error of 2 percentage points.

Meanwhile, a poll of 900 registered voters conducted by Fox News found that 51 percent of Americans favor building new nuclear power plants. Four in 10 Americans oppose plant construction.

Support has grown over the past six years. In 2002, a similar Fox News poll showed that 52 percent opposed building new reactors.

The latest survey, conducted June 17-18, also found that a 53 percent majority believes nuclear power is a safe source of energy. The poll's margin of error is 3 percentage points.

## Jobs from page 1

nuclear energy to maintain jobs and economic growth in America," said John Engler, National Association of Manufacturers' president and chief executive officer. "It is imperative that industry, government and educators join together to support the growth of nuclear energy to stimulate America's economy, protect our environment, and create good jobs here at home."

The white paper was endorsed by federal and local government leaders, including Sens. Carper and George Voinovich (R-Ohio); Reps. James Clyburn (D-S.C.), Fred Upton (R-Mich.) and Jason Altmire (D-Pa.); Wilmington, N.C., Mayor William

Saffo; and Mark Ayers, president of the AFL-CIO Building and Construction Trades Department.

"The white paper is a declaration that the revitalization of nuclear power can also revitalize middle-class America with new jobs," Ayers said. He added that the Building and Construction Trades Department has developed programs to establish multi-craft training centers at or near new nuclear plant sites, develop training partnerships with industry vendors and explore the development of regional labor agreements. To realize the economic potential new reactor projects offer, the nation must invest in the education and training infrastructure needed to cultivate the

next generation of workers.

The CASEnergy Coalition report recommended that high schools concentrate on math and science to better prepare students to become engineers, scientists and health physicists, and include training for entrance into technical careers. It also called for federal funding for schools, both at the high school and university levels, to increase.

"Nuclear enrollments have tripled in the last five years," said Gilbert Brown, a nuclear engineering professor at the University of Massachusetts-Lowell. "The students want to solve this [energy] problem." However, there is still demand for more workers and an increased need for qualified instruction at the high school and university level, he added.



JOHN ENGLER



MARK AYERS

# G-8, Other Nations Support Nuclear Energy

Amid rising oil prices and ongoing global warming concerns, more nations are embracing nuclear power and energy efficiency.

The Group of Eight (G-8), along with China,

India and South Korea, are the latest to announce their support. The world is entering a new era of nuclear power, said energy ministers of the countries present at last month's G-8 meeting.

The officials said that nuclear energy "must play an important role in achieving global energy security."

The 11 countries are currently responsible for approximately 65 percent of global energy consumption. The G-8 nations are Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom and the United States.

Germany is the only G-8 country not contemplating new nuclear plants. In fact, the nation decided to phase out its nuclear plants in 2000. German Chancellor Angela Merkel believes that the choice to end the nation's nuclear program was a mistake and that the nation must re-examine the nuclear energy option. "The phasing out of nuclear plants was wrong and should be reversed," she said.

In a separate statement, several G-8 nations and others said their leaders "recognize the important role of renewables and safe and peaceful nuclear energy in increasing energy security by diversifying the energy mix, maintaining economic growth and mitigating climate change." The nations included China, India, Japan, South Korea and the United States.

The G-8 countries also announced the creation of an International Partnership for Energy Efficiency and Cooperation to assist in the exchange of new technologies and energy-saving techniques.

Participating countries and relevant organizations will share best practice policies and measures. They also will develop public-private partnerships in key energy-consuming sectors.



PHOTO COURTESY OF TEOLLISUUDEN VOIMA OY



*Olkiluoto 3 is under construction in Finland. The reactor is expected to go on line in 2011.*

## 1,000 Nuclear Plants Needed by 2050, International Report Predicts

Countries around the world must build 32 new reactors every year until 2050 to meet predicted energy demand, according to the International Energy Agency (IEA). The agency made that prediction in its study, "2008 Energy Technology Perspectives."



*A global energy technology revolution is both necessary and achievable, but it will be a tough challenge.*

—Nobuo Tanaka  
Executive Director,  
International Energy Agency (IEA)

"A global energy technology revolution is both necessary and achievable, but it will be a tough challenge," said Nobuo Tanaka, the agency's executive director. The combination of surging energy demand, rising concerns about greenhouse gas emissions and increasingly scarce resources contributes to the need for energy reform, he added.

The agency tested two possible scenarios: one uses existing technologies that would bring global carbon dioxide emissions to current levels by 2050; the other targets a 50 percent reduction in current emission levels in the same timeframe.

Using existing technologies to limit emissions to current levels by 2050 "is difficult and costly," the IEA said. The U.N. Intergovernmental Panel on Climate Change has found that a reduction of 50 percent to 85 percent by 2050 is necessary to avoid severe global warming and climate change.

The IEA said that the world needs a "very rapid change of direction" to achieve the higher reduction. Because the technologies needed to obtain this goal are still under development, deployment costs would be staggering and the technologies' success unpredictable, the analysis said.

The report stresses the need to improve energy efficiency in appliances, buildings, industry and power generation. It also says that de-carbonizing current fossil-fuel power plants through carbon capture and storage, building more renewables, and expanding nuclear energy are imperative to achieve such reductions.

IEA suggested a "dramatic shift" in policy as well. The analysis said that an "urgent implementation of unprecedented and far-reaching new policies in the energy sector" would be required to meet a 50 percent reduction in 2050.

Government funding is required not only in construction, but in research, development and demonstration.

More ambitious standards and regulations, as well as cooperation among all nations, are essential, the group said.

# Nations Look Anew at Carbon-Free Nuclear Energy

Nations must transition to low-carbon societies to mitigate and adapt to climate change if they hope to reduce greenhouse gas emissions by half in the next 40 years, concludes a new report from the National Science Academies of the Group of Eight (G-8) and five other nations.

Such findings are leading countries within the G-8—Canada, France, Germany, Italy, Japan, the Russian Federation, the United Kingdom and the United States—as well as European Union representatives, to look anew at nuclear energy. However, the examination does not stop with these developed nations. Others see a role for nuclear power in their energy portfolios as well.

Italy plans on starting construction of a new plant within the next five years, according to Claudio Scajola, the nation's economic development minister. "During the term of this parliament, we will lay the first stone for the construction in our country of a group of new-generation nuclear power stations," Scajola said.

Italy shut its four reactors more than two decades ago. However, because Italy has become so dependent on foreign energy sources, the government is considering new nuclear power plants as part of its strategy to diversify its energy sources.

French President Nicolas Sarkozy announced that his country is willing to work with Italy to achieve its new energy goals. The announcement followed continuing public protests in France and Spain over high fuel prices.

Switzerland's president, Pascal Couchepin, believes the issue of energy poses a major challenge to the country. "Nuclear power isn't the only solution, but it is an important part of the solution," he suggested at the Swiss Nuclear Forum last month.

Switzerland operates five nuclear plants that provide 40 percent of the country's electricity. With the planned closure of the country's three oldest plants and the phasing out of electricity import contracts with France, Switzerland expects to experience an electricity generation deficit of 25 billion to



**Nuclear energy provides 40 percent of electricity for Switzerland's cities and towns, including Lucerne.**

30 billion kilowatt-hours by 2035, according to Hans Schweickardt, president of Swisselectric.

Schweickardt suggested increasing the use of hydroelectric, renewables, gas-fired and nuclear power plants. He hopes that by 2035 nuclear power will make up two-thirds of Switzerland's new generating capacity.

On the other side of the world, Vietnam may get its first reactor after lawmakers approved a law allowing the country to use nuclear energy for civilian purposes, a National Assembly official said.

The Vietnamese government has doubled its generation target established last August to 8,000 megawatts by 2025. Vietnamese officials plan to begin nuclear plant construction by 2015 and have two 1,000-megawatt reactors operating by 2020 in the Ninh Thuan province.

Elsewhere, South Africa approved a new nuclear energy policy to "ensure the reduction of our over-reliance on coal," which would reduce greenhouse gas emissions. The Department of Minerals and Energy is finalizing a policy implementation plan.

Canada will complete a nuclear energy feasibility study by the end of the year, according to Duncan Hawthorne, president and chief executive officer of Bruce Power LP, an Ontario-based private nuclear generator. The company is considering adding up to 4,000 megawatts of new nuclear capacity at its Bruce Power site.

The feasibility study will identify potential plant

locations, gauge public opinion, evaluate the customer base and recommend whether to build the plants.

"I think we take the view that the market can support the introduction of a nuclear plant. How much and how that plant enters the market is really a function of the feasibility study," he said.

Hawthorne cautioned that this is a three- or four-stage process, and it may be 12 years before the environmental assessment is complete and a volunteer host community found.



**PASCAL COUCHEPIN**

believes the issue of energy poses a major challenge to the country. "Nuclear power isn't the only solution, but it is an important part of the solution,"

he suggested at the Swiss



PHOTO COURTESY OF KKG

**More than 20,000 people visit the Gosgen-Daniken nuclear power plant in Switzerland each year.**

# U.S. Most Likely to Win New Reactor Investor Backing

The United States is the most promising country in the world for investors to provide financial assistance to build new nuclear reactors, said an Ernst & Young study.

The U.K. government asked the global advisory service provider to conduct a study examining the nations that investors would be most likely to provide capital to build new nuclear power plants. The United Kingdom, China and South Africa followed the United States, in that order.



According to the study, investors believe the United States is the most favorable because of its size, ease of conducting business and relative regulatory certainty. The research summary said that government programs and loan guarantees to assist the industry during the licensing and construction stages contributed to their decision.

Ernst & Young interviewed 18 investors from Europe and North America for its study. The research pointed out that political and regulatory stability, volatility in prices for energy and carbon dioxide emissions topped the list of concerns of financiers.



Information on the ABCs of energy is available on the U.S. Energy Information Administration's Web site.

# New EIA Briefs Make Energy Information Easier to Understand

Energy, like economics, can sometimes be difficult to understand. That's why the U.S. Energy Information Administration (EIA) has launched a new series designed to explain important energy topics in plain language.

EIA is the source of official energy statistics from the U.S. government, providing accurate and policy-neutral energy data and analysis.

The aim of the series, "Energy in Brief," is to make EIA information more accessible to energy novices. Each brief answers a question relevant to the public.

Among the briefs available on EIA's Web site are:

- How is my electricity generated, delivered and priced?
- How dependent are we on foreign oil?
- How much renewable energy do we use?
- What are greenhouse gases and how much are emitted by the United States?

In response to the question—how dependent are we on foreign oil?—for example, EIA says: "The United States imported about 60 percent of the oil we consumed during 2006. About half of these imports came from the Western Hemisphere. Our dependence on foreign oil is

expected to decline in the next two decades."

The agency also provides resources for further information. These include frequently asked questions, Energy Basics 101, an Energy Kid's Page, a glossary and a link for contacting an expert.

"Energy education is a critical part of EIA's mission. At a time when American consumers face many energy-related challenges, it is more important than ever to provide the public with reliable energy information in a format that is useful and accessible by the widest possible audience," said Guy Caruso, EIA administrator.

Members of the public can sign up to receive Energy Brief updates by e-mail. The EIA Energy Brief is available at [http://tonto.eia.doe.gov/energy\\_in\\_brief](http://tonto.eia.doe.gov/energy_in_brief).



WEB SITE SCREENS COURTESY OF EIA

# Nuclear and Wind Energy Have Lowest Impact on Wildlife

**N**uclear energy has one of the lowest impacts on the environment of any energy source because it does not emit carbon dioxide and air pollutants, isolates its waste from the environment, and requires a relatively small amount of land.

A report, prepared for the New York State Energy Research and Development Authority and the Environmental Bioindicators Foundation, puts energy sources and their impacts on wildlife into perspective. The research shows that nuclear power plants and wind generators have the lowest life-cycle impact on wildlife, according to a study conducted for the state of New York.

The preliminary study focused on all stages of an energy-producing plant, including resource extraction, fuel transportation, facility construction, power generation, transmission and delivery, and decommissioning. The effects considered were physical injury or mortality, chemical injury or mortality, disruption of normal behavior, and destruction and alteration of habitat, according to the study.

The report, developed by Pandion Systems, concluded that risks from wind and nuclear ranged from low to medium severity. Using a life-cycle analysis and ecological risk assessment approach, Pandion was able to collect and obtain scientific data related to wildlife risks and effects from every stage in the generating facility's lifespan. Hydro-



PHOTO COURTESY OF ENERGY

***The Indian Point nuclear plant along New York's Hudson River uses innovative traveling fish screens to protect striped bass from entering the intake structures and return them to the river.***

power, natural gas, oil and coal ranked below nuclear and wind.

All generating sources affect wildlife in some way, the report stressed; however, nuclear and wind are the lowest contributors to wildlife disruption. The effects and risks vary depending on which type of generating facility is analyzed and on its age and condition.

New York officials plan to release the final report this month.



PHOTO COURTESY OF U.S. FISH AND WILDLIFE SERVICE

***Energy's Indian Point also operates a hatchery to stock the river with striped bass fingerlings.***

## Now Hear This ...

***But let me say [that] under any scenario we are going to see more nuclear power because it's going to be more cost-effective once there is a price on carbon and that's why we need a global warming bill."***

—Sen. Barbara Boxer (D-Calif.)  
MSNBC's "Morning Joe"  
June 11

***The policy of 'no' is not working. We need to say 'yes' to producing more of America's resources; 'yes' to drilling in areas where we have found abundant resources; 'yes' to using a 250-year supply of coal; 'yes' to building new nuclear power plants; 'yes' to developing America's resources [and] reinvesting in America."***

—Rep. Randy Neugebauer (R-Texas)  
June 4

***With America's greenhouse-gas emissions increasing daily, it is time to stimulate the use of nuclear energy. Only then will we be able to deal with the challenges of atmospheric pollution and climate change, while meeting our nation's growing need for electricity."***

—Buffalo (N.Y.) News editorial  
June 8

# 'Red Book' Finds Sufficient Uranium For 100 Years

Enough uranium exists to fuel the world's nuclear reactors for at least a century, according to the latest research from two international organizations.

However, the book says that with new reactor designs and reprocessing, the supply of fuel needed to power the plants could extend beyond the year 3000.

"Uranium 2007: Resources, Production and Demand," which contains data collected from 40 countries around the world, examines uranium supply and consumption. The Organization for Economic Cooperation and Development's Nuclear Energy Agency and the International Atomic Energy Agency developed the analysis that industry experts have coined the "Red Book." It serves as the world reference on uranium.

PHOTO COURTESY OF CAMECO



**A Cameco worker consults procedures at the McArthur River facility in northern Saskatchewan.**

As of Jan. 1, 2007, the total world nuclear energy capacity was 372 gigawatts. The Red Book expects this to grow to between 509 and 663 gigawatts by 2030, or a percentage growth of between 38 and 80 percent.

As a result, the report expects uranium requirements will increase to between 94,000 and 122,000 metric tons. Officials based the estimate on the type of reactors in use today.

New discoveries of deposits and evaluations

of existing deposits prompted the report's authors to update the amount of worldwide uranium by 0.5 million metric tons to a total of 10.5 million metric tons.

World mining accounted for 60 percent of the fuel used in 435 reactors worldwide as of 2006. The other 40 percent came from dismantling nuclear warhead material and reprocessing of used fuel.

## NUCLEAR ENERGY *Insight*

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