

insight

FEBRUARY 2000

Wall Street Warms Up to Nuclear Energy In Third Annual NEI Briefing, Analysts Hear About Banner Year

"There's a better feeling about nuclear energy on Wall Street these days," says analyst Steven Fetter, managing director at Fitch IBCA.

One reason is the Nuclear Regulatory Commission's new oversight process, developed and tested by the agency. A second reason is the nuclear energy industry's move to become more competitive—including consolidation of nuclear plant ownership and renewal of operating licenses, says Fetter.

His views were shared by other analysts who attended the Nuclear Energy Institute's third annual briefing for members of New York's financial community. The briefings were launched to provide analysts with an industrywide perspective on the major issues facing the nuclear energy industry.

Harking back to the first briefing in January 1998, Joe Colvin, NEI president and CEO, said: "I remember telling you that competition was the best thing that had happened to this industry in a long, long time." To confirm the point, he noted that nuclear energy had fared well in the 24 states that have restructured their electric power industry. Turning to nuclear power plant performance,

Colvin said the industry's average capacity factor for last year is estimated at about 86 percent, and output for 1999 is expected to be about 720 billion kilowatt-hours—"likely the best year in our history."

be very attractive from a competitive standpoint going forward.

NUCLEAR ENERGY'S VALUE CHAIN

But the ability of nuclear plants to produce economic energy is just the beginning, Colvin told analysts. There are a number



Investors are finding value in nuclear energy

of additional ways to unlock value from the nation's nuclear plants—among them, uprating and upgrading plants, maintaining grid reliability, expanding site use, reducing clean air compliance costs for other generating sources, and marketing the industry's management tools and techniques. "Taken together,

Many members of the financial community recognize that "the economics of nuclear energy are there," as Caren Byrd, a principal with Morgan Stanley Dean Witter, puts it. The community acknowledges the ability of nuclear energy to be competitive, she says. James Asselstine, Lehman Brothers managing director, notes that "we're now at a stage where investors are getting comfortable" with the fact that nuclear energy assets are likely to

we believe these building blocks of additional value represent significant upside potential for the nuclear fleet in the future," he said.

If anything, nuclear energy may be "very undervalued" by investors, suggests David Finkelstein, senior vice president at Williams Capital Group. It's a viable energy source, but everyone is focusing on natural gas. A nuclear plant is a "practically unbeatable asset" if it is

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near-depreciated in a non cost-of-service competitive environment, he says. "We as security analysts have to do a better job of educating investors about these issues."

Finkelstein says his view of the industry has changed over the past three years, largely because of the NRC's new oversight process.

Ralph Beedle, NEI senior vice president and chief nuclear officer, told the analysts that the industry has a high degree of confidence that companies will be able to implement business decisions and reposition their nuclear assets—moving ownership shares around—within a credible and effective regulatory process.

'Yes' to License Renewal

Arkansas Nuclear One Unit 1 is the latest to jump on the license renewal bandwagon. When Entergy applied to the Nuclear Regulatory Commission earlier this month for a 20-year extension to ANO 1's license, the unit became the sixth on the agency's list.

Already under review at the NRC: license renewal applications for Baltimore Gas and Electric's two-unit Calvert Cliffs plant and Duke Energy's three-unit Oconee plant.

The financial community is abuzz with talk of license renewal, says one analyst. "There is widespread recognition that license renewal will be available to almost all nuclear units," says Caren

Byrd, a principal with Morgan Stanley Dean Witter. Indeed, the operators of 23 other nuclear units have formally notified the NRC that they will seek renewal. That's a total of 29 units—one-quarter of the nation's nuclear fleet.

What is more, the owners of as many as another 60 units have expressed an interest in license renewal, says NEI. Ultimately, well over 80 percent of the nation's nuclear power plants could be operating for another 20 years beyond their 40-year initial term.

"License renewal makes nuclear energy attractive to investors," says Byrd.

"[T]he economics of nuclear energy are there...The community acknowledges the ability of nuclear energy to be competitive."



Caren Byrd, a principal with Morgan Stanley Dean Witter

Higher Nuclear Output = Lower Greenhouse Emissions

The nation's nuclear power plants—which emit no greenhouse gases—are helping to meet America's air quality standards. In 1998, for example, nuclear plants were responsible for nearly half of the total voluntary reductions in greenhouse gas emissions reported by U.S. electric power companies.

The country's nuclear plants prevented the emission of 100 million metric tons of carbon dioxide equivalent in 1998, compared with 70 million metric tons the year before. The plants' contribution to cleaner air was the result of projects undertaken to improve efficiency and boost the amount of electricity that a plant can produce, according to the Energy Department's Energy Information Administration.

To illustrate the impact of such a project, EIA cited the Comanche Peak nuclear plant in

Texas. Thanks to improvements in efficiency and output, the TXU plant reduced emissions by 18.1 million metric tons of carbon dioxide equivalent. In contrast, the average emission reduction for a project at a fossil fuel-fired power plant was 2.2 million metric tons.

The Voluntary Reporting of Greenhouse Gases Program, created by the Energy Policy Act of 1992, records the results of voluntary measures taken to reduce, avoid or sequester greenhouse gas emissions. Since 1994, the number of projects reported each year has increased by 134 percent, and the quantity of emission reductions reported each year has roughly tripled.

Voluntary Reporting of Greenhouse Gases 1998 is available on EIA's Web site at <<http://www.eia.doe.gov/oiaf/1605/vrrpt/>>.

Finkelstein agrees. He sees the improved regulatory environment as "a positive for investors." That's because the new oversight process is focused on the issues that have the greatest impact in terms of safety, he says.

Adds Lehman Brothers' Asselstine: The transition from a prescriptive regulatory process to one that is safety-focused is the "most fundamental change that has occurred in the industry over the past three years."

The more certain regulatory environment has contributed to nuclear plants' record levels of performance, says Finkelstein. "As the approach evolved, utilities could focus on what was important to safety, what needed to be done," he says.



Q&A With Richard Meserve

New NRC Chairman: Leading an Agency in the Midst of Change

As both a physicist and an attorney, the chairman of the Nuclear Regulatory Commission—Richard Meserve—is uniquely qualified to lead the agency as it continues to improve the regulation of nuclear facilities. He was sworn in last October to serve a term through June 30, 2004. On Jan. 4, *Insight* interviewed the chairman at NRC headquarters in Rockville, Md. Following are highlights from that discussion.

Insight: This spring, the NRC plans to implement a new oversight process for nuclear power plants. What challenges do you see in moving from last year's nine pilot plants to every nuclear plant in the United States?

Meserve: I anticipate that once we've started to implement the program on a broader scale, we are going to learn of the need for further changes. I think there will be challenges in adapting to experience. As we do something new, we are bound to learn ways to do it better.

Another challenge for us is to educate and train our staff...to do things that are new. I am very confident that the staff is up to the task. We have very committed people who recognize the need for change, the importance of change and the value of change.

This is a time of turmoil and challenge for everyone. The NRC is going to be looking at slightly different things than we have looked at in the past. [Plant operators] will have to respond to the different regulatory environment that we are creating.

Insight: What is your perspective on the work getting under way to make nuclear power plant safety regulations more safety-focused?

Meserve: It is an enormously important initiative for the NRC. This process provides us with the vehicle to analyze our regulatory requirements to determine those that need to be maintained or strengthened, and to determine those that—from the perspective of minimal risk—can be justifiably relaxed.

We now have a lot of experience with reactors that we did not have at the time the regulatory requirements were written. We have new analytical tools...that provide a means of determining which components in a system have the greatest risk significance. We have never had the opportunity to fold all of that knowledge into the regulatory system. It is time that we did.

Insight: What do you think is going to be involved in maintaining the momentum of change?

Meserve: I think the commission's role is to maintain the process it has started and to assist

the [NRC] staff in addressing policy issues. ...

We also have to make sure that we provide adequate staff resources to do the job. Reformulating the way we do our work requires a large amount of staff effort to design an effective and thoughtful system.

Insight: Do you have any thoughts early in your term as to where you would like to see the NRC at the end of your term?

Meserve: I hope that we will make significant progress in implementing a risk-informed process for reactor regulation and inspection. ... We are well launched on that effort, but it's going to take continued attention and work. It is not going to be easy to perform, and it is certainly impossible to perform it in a short period.

A second task is to start to make significant progress in materials [facilities] regulation. Finally, [I would like to see the NRC] lay a foundation for a future generation of reactor construction in the United States and to put a regulatory system in place to be able to deal with that situation, when and if it arises.

Insight: What are your thoughts on the future of nuclear energy?

Meserve: I think we are in a time of change. All of a sudden, there is economic interest in reactors in a way that I don't think would have been anticipated by even [the industry] a year or two ago.

I think the economic climate is changing. I also think it is very important that we preserve a nuclear option as concerns about greenhouse gases and global warming grow, and as environmental issues associated with fossil fuels come to the fore. I think that there is at least a possibility that the environmental advantages of nuclear technologies will be recognized over time. And with changes in economic conditions—as fossil fuels become more expensive—I think there may be economic reasons why we also would want to reconsider nuclear technologies.

I hope that the United States is in a position in the future to further exploit nuclear technologies as an energy source.

Surveys Show an Informed Public Is More Supportive of Nuclear Energy

Over the course of the 1990s, surveys showed that the public became increasingly confident in the ability of an electric company to safely operate a nuclear power plant. A large majority of the public also believes that nuclear power plants meeting federal safety standards should renew their operating licenses.

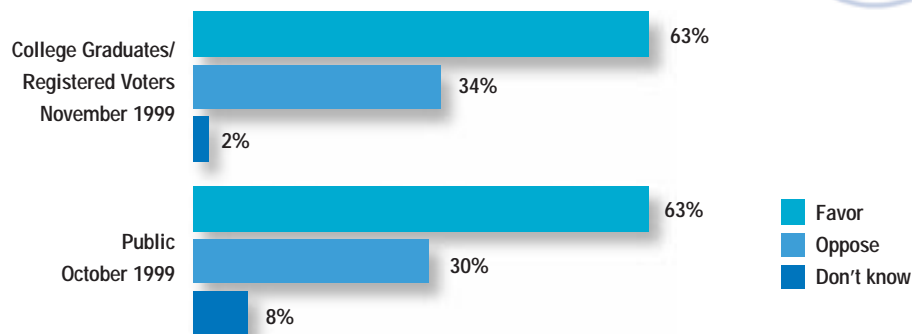
Do these trends portend greater public support for nuclear energy? They may, says Ann Bisconti of Washington-based Bisconti Research Inc.

About 63 percent of college graduates who are registered voters—and 62 percent of the general public—surveyed late last fall said they favored using nuclear energy to provide electricity. Those surveys revealed that people who feel more informed about nuclear energy are more likely to support it. For example, a single sentence about the environmental benefits of emis-

sion-free nuclear power plants resulted in a 10 percentage point increase in the number of college graduates who favored using nuclear energy. Greater familiarity with nuclear energy's bene-

fits and confidence that the technology can be safely managed should change the way the public perceives this energy source, says Bisconti.

Using Nuclear Energy To Provide Electricity for the United States



NRC Budget Proposal Would Reduce User Fees

The Nuclear Regulatory Commission collects nearly all of its budget through user fees. As a result, nuclear facilities regulated by the agency pay for programs related to their activities—and programs that aren't, such as international activities. That's about to change.

In its fiscal 2001 budget request, the NRC has



proposed a reduction in the portion of its budget recovered from user fees to 90 percent over the next five years.

In a phased approach, the agency would reduce its fee base by 2 percent each year, culminating in a 10 percent reduction. The proposal reflects the NRC's desire to reduce its dependence on user fees to pay for programs that have no relationship to nuclear facilities. The 10 percent no longer collected from regulated facilities will be drawn from the U.S.

Treasury.

The agency is requesting a total of \$488.1 million to fund its programs and activities, which represents a 3.9 percent increase for FY2001. Most of the increase is earmarked for a 3.7 percent government-wide pay increase. The total to be collected from fees on NRC-regulated facilities would amount to \$448 million.

"We applaud the NRC for taking this initiative," said Ralph Beedle, NEI senior vice president and chief nuclear officer. "This is an important step toward equity in the cost of regulation," he said.

DOE Boosts Funding Request for Used Fuel, Nuclear R&D Programs

The Clinton administration is requesting increased funding in fiscal 2001 that will keep the federal government's nuclear waste disposal program on track.

In announcing his department's proposed budget earlier this month, Energy Secretary Bill Richardson said the additional money is needed to "support the scientific work necessary for determining the suitability of Yucca Mountain as a permanent high-level nuclear waste repository." DOE seeks \$437.5 million for its waste management program—compared with a fiscal 2000 appropriation of \$347.2 million.

DOE's Yucca Mountain schedule calls for the agency to issue a draft site recommendation consideration report this November, with a final report going to the president in 2001.

Richardson also said that his department is increasing its support for nuclear energy research

DOE wants more money for studies at Yucca Mountain

and development. The \$92.2 million "investment will help maintain the viability of this energy option and secure our leadership in promoting the safe use of nuclear technologies," he said at a Feb. 7 briefing.

DOE's budget request includes continued support for two nuclear R&D programs. One—the Nuclear Energy Research Initiative (NERI)—addresses key issues "affecting the future of nuclear energy, including nuclear waste storage and disposal, and nuclear plant economics and operational safety," according to the agency. NERI, which was funded at \$22.5 million in



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FY2000, will include an international component in this funding cycle. Of the \$35 million requested for the program, \$7 million is earmarked for bilateral and multilateral R&D projects under the White House's International Clean Energy Initiative.

DOE plans to award grants for some seven new projects under NERI this spring, with at least 20 more selected for funding in 2001.

Funding for the Nuclear Plant Optimization Program—a cost-shared program with the nuclear energy industry—is \$5 million, the same amount as in last year's budget. The program focuses on issues that "could impact the continued operation of the nation's 103 nuclear power plants," says DOE. By this summer, the agency expects to initiate 15 co-funded projects on such topics as material fatigue and fuel performance.

Other nuclear energy programs in DOE's budget request include:

- university reactor fuel assistance and support—\$12 million
- isotope support—\$17.2 million
- advanced radioisotope power systems—\$31.2 million
- international nuclear safety—\$20 million.

Senate Passes Nuclear Waste Bill

In a strong bipartisan vote that signaled continued support for a used nuclear fuel solution, the Senate on Feb. 10 passed the Nuclear Waste Policy Amendments Act by a 64-34 vote.

"By providing for the efficient management of used nuclear fuel, S. 1287 helps to make it possible for Americans to derive maximum benefits from nuclear energy," said NEI President and CEO Joe Colvin.

The legislation would provide greater protections to ensure that the Energy Department's nuclear waste program stays on schedule, including early acceptance of used fuel and protection of the repository's funding stream—the Nuclear Waste Fund.

DOE's current schedule does not call for used fuel to be moved from nuclear power plants to a proposed repository at Yucca Mountain in Nevada until 2010 at the earliest. S. 1287 would require fuel acceptance shortly after DOE receives a construction permit in 2006. The bill's plan would benefit nuclear plants by moving used fuel at least five years earlier than current law.

The legislation also would require congressional approval of any increase in the rate that utility customers contribute to the Nuclear Waste Fund. Under current law, congressional approval is not required to modify the one mill per kilowatt-hour fee. So far, utilities have committed more than \$16 billion for the Nuclear Waste Fund.



Have a Question About a Nuclear Medicine Procedure? Click Here.

Doctors routinely order nuclear medicine examinations—more than 10 million are performed every year in the United States.

But not every patient knows what to expect from such an exam.

That's why the American Society of Radiologic Technologists has established a new section on its Web site where patients can learn more about a wide range of medical imaging examinations—including nuclear medicine diagnostic procedures.

The section—<http://www.asrt.org/asrt.htm>—contains seven categories of examinations. The nuclear medicine entry explains that this type of medical imaging is “unique,” because it documents an organ's function as well as its structure. Using nuclear medicine procedures, doctors are able to assess the function of nearly every organ in the body.

Although there are more than 100 different types of nuclear medicine exam, the Web site introduces patients to six of the most common: brain scan, thyroid uptake study, lung scan, cardiac imaging, gallbladder imaging and bone scan.

The page also includes a link to the Society of Nuclear Medicine's Web site, which includes information on 10 types of imaging, as well as frequently asked questions.

Energy Executives Upbeat About the Nuclear Industry

The nuclear [energy] industry should be happy,” according to an international energy consulting firm.

“For the second year in a row, the [North American energy] industry's appraisal of nuclear [energy] has improved, this year by even more than in 1999,” says PHB Hagler, Bailly in its *Energy Industry Outlook 2000*. The *Outlook* summarizes the results of an annual survey of a sample of senior U.S. and Canadian energy industry executives.

For four years, the Washington International Energy Group—now part of Hagler, Bailly—has asked executives: “Can nuclear plants compete in a price-conscious market?” Over this period, there has been a “slow but steady increase in the ‘yes’ category,” says the consulting firm.

“The dramatic and sustained improvement in operational quality...has given the industry at large reason to be modestly optimistic,” says

Hagler, Bailly in this year's *Outlook*.

Average U.S. nuclear plant capacity, which rose from 72.1 percent in 1997 to 79.5 percent in 1998, jumped to an estimated 86 percent in 1999. As a result, nuclear plant output soared, from 628.6 billion kilowatt-hours in 1997 to an estimated 720 billion kWh in 1999.

Almost 70 percent of the executives surveyed said they thought most nuclear plants would operate through their initial 40-year license terms.

Asked if nuclear plants would extend their operating licenses, 54 percent said yes. In fact, six nuclear units have applied to the Nuclear Regulatory Commission for license renewal, and another 23 units have informed the NRC that they will do so. The owners of as many as 60 more units have expressed an interest in license renewal—for a total of 89 units.

'I'm a Believer,' Says Utility Analyst

“I actually am a very big believer in nuclear power,” Edward Tirello, senior utility analyst and managing director, Deutsche Banc Alex. Brown, said last month.

Tirello was speaking at a business forum and benchmarking project workshop sponsored by the Nuclear Energy Institute.

He said companies would regret not having nuclear power plants. “At the end of the day, when you have collected all of your stranded investments and made all of your calculations, this is

going to be a cash-in, cash-out business.” Because nuclear plants will produce power “at very cheap rates,” they should be used to support industrial customers, said Tirello. He believes that economies of scale will benefit nuclear companies. He foresees five or six companies operating the nation's nuclear fleet. Companies “need to get bigger to be the supplier of choice” nationwide, he said, because industrial companies that contract for energy will be able to buy from the cheapest producer in the country, not merely their region.



Nuclear Plant Operators Report Record 1999

U.S. nuclear power plants produced more electric power with greater efficiency in 1999 than ever before.

The capacity factor—actual plant output compared with potential output—was 86 percent through November, up from 79.6 percent for the first 11 months of 1998.

Total electrical output jumped 8 percent through October, putting the nation's nuclear plants on track to surpass the 1998 total of 673.7 billion kilowatt-hours. Final 12-month figures will be available the end of March.

Meanwhile, several nuclear operators are reporting record performance:

■ **Arizona Public Service:** The Palo Verde nuclear generating station set a new site and national record for total generation—30.4 billion kilowatt-hours. It had a site record capacity factor of 93 percent.

■ **Carolina Power & Light:** The Robinson, Harris and Brunswick nuclear plants set their sixth consecutive record for total generation—26 billion kilowatt-hours compared with 25.5 billion kWh the year before.

■ **Commonwealth Edison:** The company had a record production year, with an overall capacity factor of 89.4 percent for its 10 generating units and a production record that surpassed its previous (12-unit) record by nearly 4.5 billion kilowatt-hours. The Braidwood, Quad Cities, Byron and Dresden plants beat ComEd's all-time best site capacity factor.

■ **Detroit Edison:** The Fermi 2 nuclear plant logged a 100.3 percent capacity factor and generated a record 9.48 billion kilowatt-hours. Its capacity factor was the highest among all U.S. boiling water reactors.

■ **Dominion Generation:** The North Anna and Surry power stations set a company record, generating 28.3 billion kilowatt-hours, a 4 percent increase over the previous record of 27.2 billion kWh. The overall capacity factor of the four units was 95.2 percent, compared with the previous record of 91.7 percent set in 1998.

■ **Duke Power:** The Oconee and Catawba stations had their highest outputs ever, generating 19.8 billion kilowatt-hours and 17.9 billion kWh, respectively.

■ **Nebraska Public Power District:** The Cooper nuclear station set records for generation—6.5 billion kilowatt-hours—and for capacity factor—96.8 percent.

■ **New York Power Authority:** The Indian Point 3 and FitzPatrick nuclear plants totaled 13.8 billion kilowatt-hours, exceeding the previous best total by more than one billion kWh.

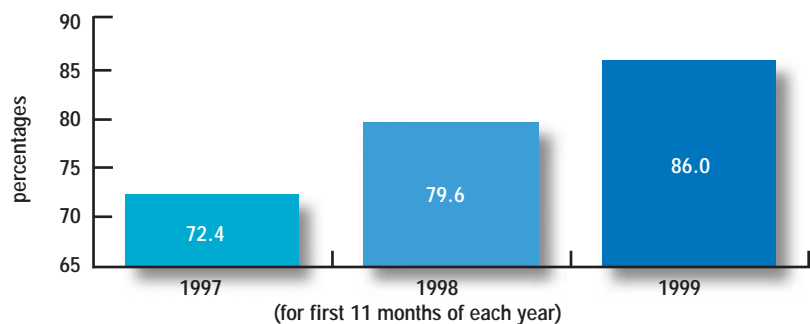
■ **Northern States Power:** The Prairie Island and Monticello plants produced a combined 13.32

billion kilowatt-hours of electricity, surpassing the 1995 record of 13.24 billion kWh.

■ **PECO Nuclear:** Company nuclear generation reached 36.3 billion kilowatt-hours, breaking the previous record of 34.7 billion kWh, set in 1997. The Limerick plant generated 18.3 billion kWh and the Peach Bottom plant generated 18.0 billion kWh.

■ **Southern Nuclear Operating Co.:** The Hatch plant in Georgia generated 13.0 billion kilowatt-hours of electricity, surpassing the previous record of 12.8 billion kWh, set in 1998. Farley Unit 1 in Alabama edged out its old record set in 1996 by producing 7.2 billion kWh.

Average capacity factor soars



Globally, U.S. Plants Excel

Talk about world-class performance! U.S. nuclear power plants accounted for 85 percent of the worldwide increase in electricity production in 1999, according to an annual survey by McGraw-Hill's *Nucleonics Week*. Nearly half of the world's top 50 producers by generation were U.S. nuclear plants.

Measured by capacity factor, U.S. nuclear units captured six of the 10 top positions:

- Virginia Power's North Anna 1 (1st place)
- Arizona Public Service's Palo Verde 3 (2nd place)
- Commonwealth Edison's Braidwood 1 (4th place)
- Southern Nuclear Operating Co.'s Farley 1 (6th place)
- Virginia Power's Surry 1 (7th place)
- TVA's Sequoyah 1 (8th place).

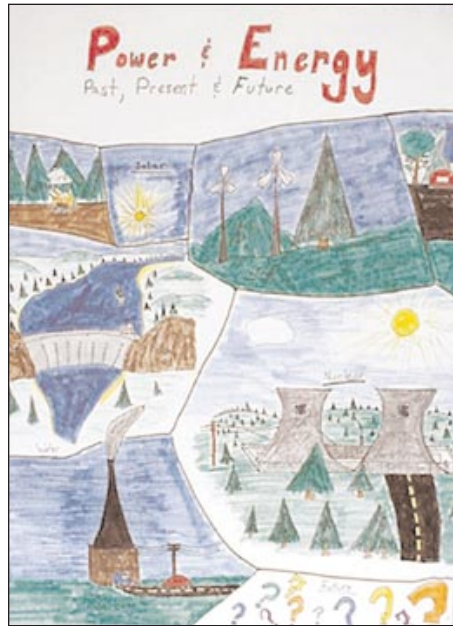
The United States has about 25 percent of the world's nuclear plants, but U.S. units accounted for about 40 percent of the top 50 units by capacity factor.

Online Gallery Displays Students' 'Power Art'

In response to the Energy Department's "Power Art" contest, some 4,000 students across the country put pen—and crayon and paint—to paper. The resulting poster art provides insight into these students' views of energy technology's accomplishments and promise.

DOE asked boys and girls in grades 4 to 8 to submit artwork illustrating the theme: "Energy Millennium—Honor the Past, Imagine the Future." From the thousands of entries, a panel of judges selected 100—based on creativity, originality and appropriateness to the theme—for a traveling exhibit. The exhibit opened in Washington, D.C., in December, and began touring the country in January.

The top 100 posters also are "on display" in what DOE calls its "Power Art" Cyber-Gallery at



< <http://www.ma.doe.gov/PowerArt/> >. The artwork is grouped into 12 energy sources—including nuclear energy—with a brief description of each.

"One out of every five homes and businesses in the country gets its electricity from nuclear power plants," says DOE. "Nuclear energy, unlike energy from coal, oil and natural gas, releases no harmful gases into the air and does not contribute to global warming."

Sixth grader Timothy Ruh of New Preston, Conn., is one of 100 finalists in the Energy Department's "Power Art" contest. His poster, "Power & Energy—Past, Present & Future," is included in the nuclear energy section of DOE's online gallery.

NUCLEAR ENERGY insight

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