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U.S. Nuclear Power Generation Makes A Return after a Two-Decade Hiatus

By Steven J. Storts
Dublin, Ohio

EVERY now and then, an event comes along in the power industry that bears repeating and further examination. That event is the first nuclear reactor to go online in the United States in two decades. The Tennessee Valley Authority's Watts Bar Unit 2, which achieved its first sustained nuclear fission reaction in late spring, recently connected to the national electrical grid in June. Commercial operations are expected to be at full capacity later this summer.

The reactor is currently operating in a stable condition at low-power levels. With the plant systems and controls under continual monitoring, power levels will be slowly increased up to 100 percent as part of scheduled power ascension testing. TVA will repeat these tests multiple times to ensure the entire system operates safely as designed. Once all tests have been completed successfully, Unit 2 will provide a sustained 1,150 megawatts of lower-cost, carbon-free electricity to the Tennessee Valley.

"This is another major step in fully integrating Watts Bar Unit 2 as the seventh operating unit in TVA's nuclear fleet," says TVA Chief Nuclear Officer Joe Grimes. "It is rewarding to see TVA taking the lead on delivering the first new nuclear unit of the 21st century and providing safe, affordable, and reliable electricity to those we serve." The key word is "safe," as Unit 2 is the first to meet new safety regulations implemented after the formidable meltdown of the Fukushima Dai-ichi nuclear plant in Japan in 2011.

Like its sister, Watts Bar Unit 1, the nation's former newest reactor that came online in 1996, Unit 2, produces electricity using controlled nuclear fission to generate heat, which is then used to produce steam to turn turbines and a single large generator. Combined with Unit 1, the plant will eventually supply 2,300 megawatts of electric power to about 1.3 million homes in the TVA service area.

The Watts Bar plant is located on 1,700 acres on the northern end of the Chickamauga Reservoir near Spring City in eastern Tennessee. Watts Bar once held the distinction of being the only U.S. power installation to generate electricity using hydroelectric power, fossil fuel (retired), and nuclear technology.

Although often termed a "new" reactor facility, Watts Bar is actually one of the longest construction projects in U.S. history, spanning more than four decades. Construction of the nuclear generating plant began in 1973, six years after TVA announced its ambitious plan for 17 new nuclear reactors in Alabama, Mississippi, and Tennessee. However, economic issues in the 1980s and high construction costs caused TVA to drop almost half of those projects. Nevertheless, construction on Watts Bar continued at a slow pace, delayed by regulatory issues, until Unit 1 was finally completed, licensed, and operational in 1996.

Unit 2 also incurred construction and regulatory delays, including cost overruns, until construction finally resumed on the Westinghouse pressurized water reactor in 2007 after years of the project being mothballed. The U.S. Nuclear Regulatory Commission

(NRC) issued an operating license for Unit 2 last October.

On the cost side, Unit 2's completion budget rose to \$4.7 billion, higher than expected but still below the projected expense of reactors being built at TVA's Vogtle plant facility in Waynesboro, Ga., which are currently slated to top \$10 billion. The additional costs for Unit 2 were attributed in part to delays in completion, extra flood controls, and emergency equipment required to prevent nuclear accidents like those at Fukushima Dai-ichi.

On a lighter note, there has always been some mystique surrounding the Watts Bar namesake, for which there are two competing theories. The area surrounding Watts Bar was inhabited by the Cherokee, Creek, and Choctaw Native American tribes during the late 18th century. The first theory emanates from some of the descendants of Meigs County's original settlers, who claim that the area was named from a Native American named Wattsi and that the Watts Creek was formerly known as Wattsi Creek.

The second theory derives from historical records showing that the territory surrounding Watts Bar during the latter part of the 18th century belonged to John Watts, a Choctaw chief, famous for his ability as a warrior and leader. No direct connection has been found linking his name with Watts Bar, thus leaving open another speculative theory.

Regarding safety concerns, Watts Bar is not without some controversy, according to the *Chattanooga Times Free Press*. Plant employees have alleged more safety problems already this year than at any other nuclear power plant in the country, the NRC

reports, bringing the total to nearly 55 complaints made to regulators during the past three years. Only the Millstone Nuclear Power Station, the largest power plant in Connecticut, has logged more safety complaints from its employees since 2012.

However, NRC sources note that the seriousness of allegations is more important than the quantity, “so just adding up the number may not indicate how serious a problem there may or may not be.” The NRC further adds that when more workers are at a nuclear plant, as they have been during final construction of the Unit 2 reactor at Watts Bar, there are often more concerns voiced by employees.

Still, the *Free Press* points out that regulators have concluded that TVA has a problem with employee safety concerns and the way they are being handled at the Watts Bar twin-reactor

facility. More importantly, NRC has determined that a “chilled work environment” exists within the operations staff at the Watts Bar plant, where some employees may not have felt free to raise safety concerns, and some licensed operators may have been unduly influenced and directed by sources external to the control room.

TVA spokesman Jim Hopson says the utility takes NRC’s determination “very seriously” and is working to respond to employee concerns while trying to improve the plant’s work environment. “We have a robust employee concerns program and continue to actively encourage employees to raise concerns, including reporting them to the NRC,” he emphasizes.

In terms of external safety, industry sources note that Watts Bar has been designed and constructed to withstand

earthquakes, any huge dam failures, hurling objects from tornados, and even airplane crashes. The two cooling towers are 506 feet high with a base diameter of 405 feet and a water flow rate of 410,000 gallons per minute. Primary containment has an inside height of 197 feet and an inside diameter of 115 feet. The reactor vessel is almost 44 feet high with an inside diameter of 14 feet and steel thickness of more than nine inches. The reactor core holds 193 fuel assemblies, each containing 264 fuel rods.

July 2016

Green Energy Project Development Shows Steady Utility Increase in U.S.

By Steven J. Storts
Dublin, Ohio

AS the Obama administration deliberates on the controversial Keystone XL pipeline crossing the U.S. border from Canada, the industrial pursuit of domestic green energy — hydropower, wind, and solar projects — continues at a modest pace, with hydroelectricity generation still leading the renewable pack.

North American hydroelectric consumption, however, did see a slight decline of 6.3 percent in 2012, according to Plunkett Research Ltd., attributed to a below-average year due to widespread droughts.

The U. S. Energy Information Administration reports that renewable energy sources provided about 12 percent of total U.S. utility-scale electricity generation in 2012, up slightly from 11.83 percent in 2011, and 10.7 percent in 2010. The largest share of the renewable-generated electricity derives from hydroelectric power (56 percent), followed by wind (28 percent), biomass wood (8 percent), biomass waste (4 percent), geothermal (3 percent), and solar (1 percent). Coal (37 percent), natural gas (30 percent), nuclear power (19 percent), and petroleum (2 percent) remain the other primary sources of domestic energy production.

Wind power in the United States has grown dramatically from 11,187 megawatts of electricity in 2003 to 140,089 MW in 2012. Nationwide, investors directed \$25 billion into wind energy in 2012, with U.S. wind farms reaching 60 gigawatts of capacity, according to the American Wind Energy Association (AWEA).

In 2013 alone, construction began on wind projects across 13 states, slated to generate more than 2,300 MW of electricity. Texas remains firmly entrenched as the leader in wind power development, with seven of the 10 largest wind farms in the nation, according to the U.S. Department of Energy, followed by Iowa, California, Minnesota, and Washington, with additional projects in Alaska, Colorado, Kansas, Massachusetts, Michigan, Minnesota, Nebraska, North Dakota, Oregon, and South Dakota.

The Maine Public Utilities Commission recently voted in favor of an offshore pilot wind project that, hopefully, will lead to commercial scale, floating offshore wind farms. Pending with the project is a \$46 million DOE grant aimed at creating large offshore wind farms that can produce power at competitive rates. Farther south, the New Jersey Board of Public Utilities is deciding whether to approve a 25-MW demonstration wind project about three miles off the coast of Atlantic City, the state's first offshore wind venture and the forerunner of a more expansive wind farm in federal waters.

In Missouri, Element Power US, owner and developer of the Mill Creek Wind Farm, and Kansas City Power & Light's Greater Missouri Operations recently entered into a power purchase agreement for the 200-MW wind energy facility being constructed in Holt County. Once operational, the wind farm will be the largest in Missouri. And in the Blue Mountains of Utah, construction began in early December on an 80-MW wind facility, a project that qualified for \$42 million of investment tax credits.

Utilities are poised to invest in more wind power because "it's the smart thing for their ratepayers and their bottom lines," says Emily Williams, AWEA senior policy analyst. "Xcel Energy, Detroit Edison, Austin Energy, Omaha Public Power District, and American Electric Power's Public Service Company of Oklahoma have all pursued contracts in excess of their initial requests for more wind power generation because wind is saving their consumers money."

On the solar energy front, both photovoltaic and concentrated solar power/thermal plants are experiencing significant technological innovation, including the use of polymers leading to more flexible solar panels and advanced nanotechnology. In 2012, CSP-generating units were the main source of electricity at 12 power plants in the United States — 11 in California and one in Nevada.

According to the Solar Electric Power Association's annual megawatt production rankings, Pacific Gas and Electric Co. in northern California led all utilities nationally in 2012 and installed more than 800 MW, an 80 percent increase over 2011. Its portfolio included nearly 630 MW of large-scale projects of which 50 MW were utility-owned. PG&E also interconnected more than 17,500 net metered systems in 2012.

Southern California Edison ranked second with more than 190 MW of new solar power generation, driven primarily by 15,000 residential and nonresidential projects accounting for more than 150 MW.

Public Service Electric and Gas Co. in New Jersey rounded out the top three utilities, and along with Jersey

Central Power & Light and Progress Carolinas, was one of three utilities from the East Coast in SEPA's top 10 rankings.

Sacramento Municipal Utility District, the only municipal utility to gain a national ranking, secured the ninth spot with nearly 70 MW of new solar power generation. Its portfolio was backed by the utility's procurement of more than 50 MW of large-scale photovoltaic projects. Other utilities in SEPA's top 10 rankings for 2012 included the Arizona Public Service Co., NV Energy, Tucson Electric Power Co., and the Hawaiian Electric Co. Utilities in the megawatt category were generally large, with a median of 1.1 million customers, compared to the median size of 300,000 for the top 100 utilities that participated in the survey.

With hydropower facilities generating 100,000 MW of renewable energy from coast to coast, the United

States is the fourth largest producer of hydroelectricity in the world after China, Canada, and Brazil. The Grand Coulee Dam remains the fifth largest hydroelectric power facility in the world, and another six U.S. hydropower plants, including Hoover Dam, are among the 50 largest in the world. The top 10 hydropower-generating states continue to be Washington, Oregon, New York, California, Alabama, Idaho, Tennessee, Montana, Arizona, and North Carolina.

The U.S. Army Corps of Engineers also recently identified 223 potential sites for additional hydro development nationwide, based on criteria that a site must be capable of generating 1 MW or greater of hydroelectric power. According to the USACE study, the sites could combine for a cumulative output potential of 6,256 MW, although the Corps noted that only 2,818 MW of those would likely be

economically feasible under assumptions made in the report.

To further bolster hydropower production, two bills were signed into law last August: the Hydropower Regulatory Efficiency Act (H.R. 267) and the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act (H.R. 678). The former promotes the development of small hydropower and conduit projects and aims to shorten regulatory timeframes for some low-impact hydropower projects, such as adding power generation to existing non-powered dams and closed-loop pumped storage. H.R. 678 authorizes small hydropower development at existing U.S. Bureau of Reclamation-owned canals, pipelines, aqueducts, and other manmade waterways.

January 2014

Renewable Energy Output Continues To Show Modest Gains in U.S. Market

By Steven J. Storts
Dublin, Ohio

AS regulatory agencies continue their focus on U.S. nuclear power plant safety and inspection following the Fukushima Dai-Ichi plant disaster in Japan, utility advocates for renewable energy are gazing into a crystal ball. And they like what they are seeing.

Renewable energy accounted for 11.14 percent of the domestically produced electricity in the United States during the first six months of 2010, according to the U.S. Energy Information Administration, with hydroelectricity as the largest producer of renewable power. In 2009, domestic energy production from renewable sources was 10.6 percent of total energy production, with increased gains in utility market share by wind and solar power generation.

For instance, Plunkett Research Ltd. reports that wind power has seen rapid growth both worldwide, especially in the United States, with its capacity more than doubling in the past three years. In fact, the first quarter of 2011 witnessed more than 1,100 megawatts of wind power capacity installed—more than double the capacity installed in the first quarter of 2010—bringing the U.S. wind industry's current power capacity to nearly 41,400 MW, according to the American Wind Energy Association.

As for cost-effectiveness, AWEA says utilities can lock in wind energy prices for 20 to 30 years because the fuel is free, which is one reason why wind power has added 35 percent of all new generating capacity to the U.S. grid since 2007—twice what

coal and nuclear power generation combined have added to the grid. Even large commercial wind turbines, rated at 500 kilowatts to more than a megawatt, can generate electricity for as little as four to five cents per kilowatt hour.

Texas is firmly established as the leader in wind power development, according to the U.S. Department of Energy (DOE), with an installed capacity of 10,085 MW in 2010, followed by Iowa (3,675 MW), California (3,177 MW), Minnesota (2,192 MW), and Washington (2,104 MW). The Roscoe Wind Farm in Texas continues to be the largest facility in the world, with an installed capacity of 781 MW.

In the past few years, some of the nation's publicly owned utilities and rural electric cooperative utilities have begun adding wind power to their energy supply portfolios, including Great River Energy in Minnesota, Holy Cross Energy in Colorado, the East River Electric Power Cooperative in South Dakota, the Kotzebue Electric Association in Alaska, CPS Energy and Denton Municipal Electric in Texas, the Minnkota Power Cooperative in North Dakota, and the Nebraska Public Power District.

Municipal utilities are harnessing wind resources, too, including Austin Energy in Texas, the Hull Municipal Lighting Plant and the Princeton Municipal Light Department in Massachusetts, Moorhead Public Service in Minnesota, the Eugene Water and Electric Board in Oregon, the Municipal Energy Agency of Nebraska, and Waverly Light and Power in Iowa.

On the sunnier side of renewable energy, solar power is experiencing a technological renaissance. Plunkett Research cites a significant rise in the percent ratio of solar energy that is being converted into electricity, along with the increased use of polymers leading to more flexible solar panels and nanotechnology creating breakthroughs in solar technology itself.

Solar power advocates are touting the 561 MW of solar electricity capacity added in 2010, representing 100 percent growth over 2009. Of that increase, 140 MW were earned by utilities.

"More and more utilities are integrating solar power into their energy portfolios, including many in states like New Jersey, Idaho, and North Carolina," says Julia Hamm, president and chief executive officer of the Solar Electric Power Association. "Solar power has largely been associated only with California and the Southwest, but that's no longer the case." SEPA's 2010 analysis of utilities' solar power markets reveals that 63 percent of new energy capacity came from other states.

According to SEPA statistics, Pacific Gas and Electric Company in northern California led all utilities in the most new solar energy added to its grid with a total of 157 MW. However, seven of last year's top 10 solar utilities were from outside of California, with four of them located in the Eastern United States: Florida Power & Light Company (87 MW), Public Service Electric & Gas Company in New Jersey (75 MW), Jersey Central Power & Light (23 MW), and Duke Energy Carolinas (21 MW).

Although wind and solar power generation has made strident gains during recent years, hydropower still accounted for six percent of total U.S. electricity generation for all 50 states and 60 percent of generation from renewables in 2010. The top 10 hydropower-generating states continue to be Washington, Oregon, New York, California, Alabama, Idaho, Tennessee, Montana, Arizona, and North Carolina.

In terms of facilities, the federal government operates a total of 133 hydroelectric power plants, representing eight percent of the nation's

hydroelectric facilities. The other 92 percent (1,623 facilities) are operated by the private sector, public utilities, and state or local governments.

The National Hydropower Association estimates that the nation's power industry could install 60,000 MW of new capacity by 2025 depending on policy changes. Nearly 9,000 MW would come from modernization projects, such as turbine and generator upgrades, operational improvement, and adding capacity, according to a recent Navigant study. In fact, DOE recently earmarked \$32 million in modernization funding to

upgrade seven hydropower facilities.

NHA further reports that many new energy technologies have entered the market or have seen major advances in recent years. These involve the harnessing of ocean waves and tidal movements and hydrokinetic power (tapping the power of flowing water). Hydropower advocates claim that the potential of these new technologies could meet 10 percent of U.S. electricity needs.

July 2011

Nuclear Power Still a Worthy Player In the Overall U.S. Energy Picture

By Steven J. Storts
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LESS than one month before Japan's devastating earthquake and tsunami and ensuing nuclear breaches at the Fukushima Dai-Ichi plant, public support for nuclear power generation in the United States was continuing its climb, with more than 70 percent of respondents in a recent opinion survey indicating that nuclear energy will and should play a prominent role in the nation's future.

The survey data, released in late February by Bisconti Research Inc. and GfK Roper Consulting, also showed a strong majority of respondents, 66 percent, indicating that more nuclear facilities should be built. The Nuclear Energy Institute (NEI), which sponsored the research, further noted that support for nuclear power had steadily moved upward from 49 percent in 1983. Equally important, 67 percent of Americans were viewing nuclear plant operations as safe, compared to only 35 percent indicating such in 1984.

Not surprising, new polling data following the Japanese events tell a different story. A CBS News survey has public support for nuclear energy dropping to 43 percent; a *USA Today*/Gallup Poll shows a decline from a high mark of 62 percent early last year to a 44 percent low; and a Pew Research Center survey finds 52 percent opposing nuclear power expansion.

Other research by the Civil Society Institute, a nonpartisan think-tank, indicates that 53 percent of Americans would support a moratorium on any new reactor construction, but only if

current energy demands could be satisfied by renewable energy technologies such as wind and solar.

That scenario, though, poses a great challenge for anti-nuclear advocates because the United States currently has 104 nuclear power reactors in 31 states, operated by 30 different power companies. Together, they produce 20 percent of the nation's electricity. Industry analysts contend that it would be nearly impossible to replace any significant amount of that energy production with other sources in a cost-effective manner.

Whether support for nuclear energy permanently wanes in light of recent events in Japan largely depends on how quickly and effective the energy industry can respond to renewed public skepticism and concern regarding the structural and operational safety of nuclear power facilities.

NEI, a leading industry trade group whose recognized member companies have been providing technical expertise and equipment assistance during recovery efforts in Japan, reports that nuclear power companies have already initiated an assessment of the events in Japan. In view of their findings, steps are now being taken to ensure that U.S. reactors could respond to similar events that may challenge the safe operation of nuclear facilities.

Such precautions include verification of all operations staff, equipment, and technical capabilities to address the following: invasive aircraft impact; loss of major plant operations due to natural forces, fires, or explosions; total loss of off-site power; flooding within and around

plant facilities; and loss of major equipment functions during seismic events.

In late March, a Bloomberg news service reported that the Westinghouse Electric Co. nuclear plants now being constructed in China and the United States and proposed for Brazil are immune to any loss of off-site power, a key factor that adversely affected the nuclear reactor crisis in Japan, according to Aris Candris, chief executive officer of Westinghouse, a unit of Tokyo-based Toshiba Corp. He confirms that the new plants can operate without relying on external power in the event of an earthquake matching the 9.0 magnitude level that struck Japan.

Over the last several years, U.S. companies have applied to build more than 20 nuclear reactors using technology from Westinghouse, Mitsubishi Heavy Industries Ltd., Areva SA, and GE Hitachi. The Nuclear Regulatory Commission (NRC), which is reviewing the license applications, notes that Westinghouse reactors would be used in 14 of the projects.

Site preparations for new reactors have begun in Georgia and South Carolina, and plans are moving forward in Tennessee to finish a reactor project that started years ago but was never completed. NEI officials expect the Tennessee reactor to come online in 2013, and 2016 is the target date for operations to begin in South Carolina and Georgia. Meanwhile, new research and development projects focused on enhanced technologies for uranium enrichment are tentatively on schedule in Idaho, New Mexico, North Carolina, and Ohio.

If the U.S. power industry can survive the heightened public scrutiny and a more lengthy NRC review process, eight new reactors could be generating electricity by 2020, according to NEI projections. President Obama's 2012 budget proposal for \$36 billion in federal loan guarantees to build modernized nuclear power plants could help provide some assurance for that energy expansion. However, congressional budget negotiations and NRC's reassessment of the nation's nuclear facilities could delay those loan guarantees, even if approved.

Still, recent bipartisan support for the nuclear power industry has been

clearly evident in Congress, at least prior to the events in Japan. In early March, the Nuclear Power 2021 Act was introduced in the Senate to facilitate development of small, scalable reactors using two design parameters: one fewer than 300 MW of electric generating capacity and the other fewer than 50 MW. Smaller reactor designs are an attractive energy option for some rural regions because they can be installed incrementally in less-populated areas that do not require large power stations.

April 2011

Arizona Gets O.K. for First Oil Refinery To Be Built in Nearly 30 Years

**By Steven J. Storts
Dublin, Ohio**

THE U.S. Environmental Protection Agency recently cleared a draft permit for the construction of a \$2.5 billion oil refinery near Yuma, Arizona. The facility would be the first refinery ever built in the state and the first such new facility built in the U.S. in nearly three decades. The Arizona Department of Environmental Quality, which announced the EPA action, says it doesn't anticipate any challenges to issuance of the final permit.

The refinery, to be built by Phoenix-based Arizona Clean Fuels Yuma L.L.C., would be located along Interstate 8 about 40 miles east of Tacna, in eastern Yuma County. The site is near the Mexican border, and company officials are in negotiations with Mexican authorities for both a supply of crude oil and construction of a terminal and pipeline to carry crude to the refinery from a Mexican port on the Gulf of California.

"ADEQ's approval of our application is confirmation that this refinery will comply with every local, state, and federal clean air law and regulation that governs new stationary sources," says Glenn McGinnis, CEO of Arizona Clean Fuels. "And it is validation that the technology does indeed exist to build a state-of-the-art refinery that can operate more efficiently and cleaner than any other existing refinery in the U.S. We will now focus on securing the remaining permits necessary in order to begin construction and, ultimately, begin serving the growing demand for fuel products in the Southwest."

In August 2003, one of Arizona's two gasoline supply pipelines ruptured, sending prices at the pumps to unprecedented levels and causing service stations to run dry. Suddenly, industry and government officials realized how precarious it was to be entirely dependent on two product pipelines for all of its gasoline, diesel, and jet fuel. Not surprising, either, an opinion poll conducted within months of the fuel supply crisis showed that 90% of the public supported the construction of an oil refinery in Arizona if all environmental regulations were met.

When the project is completed, Arizona Clean Fuels expects to refine about 150,000 barrels per day of fuel products for the Arizona and Southern

California markets: 85,000 barrels of gasoline, 35,000 barrels of diesel fuel, and 30,000 barrels of jet fuel. Construction startup is planned for next year.

The company has enlisted several regionally and nationally recognized project advisors and technical consultants to help in the planning and development of the refinery and its operation, including Baker & O'Brien, Bechtel, CIS, Copper State Consulting Group, Greystone Environmental, Purvin & Gertz, Transcon Environmental, UOP, URS, and WesPac Pipelines.

June 2005

Energy Exploration in ANWR Awaits House, Senate Budget Negotiations

By Steven J. Storts
Dublin, Ohio

FOR more than two decades, the thought of tapping vast oil reserves in the Arctic National Wildlife Region has been just wishful thinking, kept in check by environmental advocacy groups and a lack of bipartisan congressional support. Now, however, there may be hope for domestic energy expansion into ANWR. As part of a budget resolution for fiscal year 2006, the Senate recently voted 51 to 49 to open of 2,000 acres of the Arctic Coastal Plain for oil and natural gas development.

More than 19.5 million acres comprise ANWR, which was set aside by Congress in 1980 primarily for possible exploration for new energy sources. The Senate's approval to open a small portion of the region is a welcomed, critical step toward an energy policy that includes developing domestic oil and natural gas supplies, according to industry analysts.

"The Senate vote is also a recognition that there is a cost to inaction, and that such a cost falls heavy on American consumers," the American Petroleum Institute states. "A comprehensive national energy strategy is needed to secure our nation's economic future through affordable, reliable, and secure energy supplies. "With their use of ever-improving cutting-edge technology, our companies have established a proven record of responsible exploration in the Arctic."

API admits that ANWR alone cannot provide the U.S. with all the necessary energy sources, but combined with the development of other domestic oil and natural gas supplies, along

with greater energy efficiency and diversification, "it would make a tremendous difference." The Arctic is estimated to have 10.4 billion barrels of oil, which is slightly larger than the initial estimates of the Prudhoe Bay discovery. "And those estimates more than doubled once exploration was allowed," the institute notes. "ANWR could provide the equivalent of current oil imports from Saudi Arabia for more than 20 years."

Optimism aside, the possibility of ANWR exploration becoming a reality still rests within the hands of federal lawmakers. Sen. Lisa Murkowski (R-Alaska), one of the proponents for energy exploration, says the most immediate hurdle is whether Congress will agree to a final budget resolution this year because the respective budget measures of both the Senate and House of Representatives have to be reconciled through the conference process.

Murkowski notes that there will continue to be strong opposition to any ANWR exploration. "At any point in time in this process, there could again be an effort to strip the ANWR provision from what is being considered," she emphasizes. "I think it's going to be a significant battle. We have been up against a well-funded group of committed organizations."

Assuming that the final budget resolution contains ANWR legislation, the Senate Energy Committee would have until June 5 to draft legislation for leasing options in ANWR. Murkowski says both the House and Senate must then pass budget reconciliation bills to implement the legislation. A final budget reconciliation conference report containing ANWR provisions is

expected to be signed by President Bush.

U.S. Energy Secretary Samuel Bodman labels the Senate's vote to clear the way for environmentally responsible energy exploration in ANWR as a victory for American consumers and the nation's economy and energy security. "Since President Bush put forth his strategy to improve America's energy security four years ago, Congress has failed to pass comprehensive energy legislation," he notes. "The American people have waited long enough. It's time for Congress to act."

Commenting on the political implications, Sen. Ted Stevens (R-Alaska) praised the recent pro-ANWR votes from Democratic Senators Daniel Inouye and Daniel Akaka of Hawaii and Mary Landrieu of Louisiana. "This has been a team effort and a bipartisan effort," he says. "We've been after this now for 24 years. We believe this is the greatest reservoir for oil and natural gas on the North American continent, so it really must be explored and developed. The Senate has now moved toward keeping the promise it made to Alaskans in 1980."

Murkowski points out that she and her colleagues on both sides of the congressional aisle have debated the potential effect on the environment in opening ANWR to energy exploration. "I live there. My family lives there. I'm the last person in the world that wants to see my state spoiled," she explains. "I want to make sure that what we do when it comes to development is going to be done in balance with our environment. And you know what? We figured out how to do that on the North Slope. We have seen a tenfold increase in the Central Arctic

caribou herd since Prudhoe was opened 30 years ago.”

The National Association of Manufacturers dismisses environmental opponents to energy exploration and production in ANWR as those “oblivious to the tremendous technological progress achieved during the past 20 years.” Michael Baroody, NAM executive vice president, explains, “Arguments against developing ANWR as a significant source of oil and natural gas are simply outdated. With today’s surveying and drilling technology, the ecological footprint we’ll leave will be negligible.”

The one million-plus barrels a day that ANWR can eventually produce won’t solve all of America’s long-term energy problems, says Baroody. “But they’ll certainly help stabilize prices as we work to improve energy efficiency, bolster conservation efforts, and otherwise develop the next generation of energy technologies,” he contends.

During final debate over the ANWR provision, Murkowski said there is an even chance that opening ANWR will provide the U.S. with one million barrels of oil a day. “Some have decried that ANWR won’t produce much oil,”

she notes. “That is enough fuel to run every car and home in Washington state for 68 years. It’s enough to replace all of our imports from Saudi Arabia for 25 years. It’s enough to double all the oil taken out of East Texas in the past 75 years. And it’s enough oil to save America from writing a check for \$56 million a day to OPEC or other foreign producers every day at current prices.”

May 2005

Congress Gives Final Approval to Build Natural Gas Pipeline from Alaska

By Steven J. Storts
Dublin, Ohio

A \$10 BILLION military construction bill approved by Congress in October contains enabling provisions and related incentives for a natural gas pipeline from Alaska to the Midwest, including federal loan guarantees up to \$18 billion, a seven-year pipeline depreciation tax credit, and an enhanced oil recovery tax credit.

The pipeline provisions were part of two funding measures that will provide \$57.6 billion for U.S. Department of Homeland Security programs, U.S. Department of Defense construction, and efforts to help Florida and other states rebuild from hurricanes and other disasters.

The military construction conference report, approved by the Senate and expected to be signed by the president, includes provisions that direct the Federal Energy Regulatory Commission to expedite the pipeline permitting once certain requirements have been met.

Additionally, the report designates FERC as the lead agency for the National Environmental Policy Act process and requires a single environmental impact study, expedited judicial review and dispute resolution process, and an allowance for future pipeline expansions.

According to *Petroleum News*, the construction bill also provides a loan guarantee authorizing the U.S. Secretary of Energy to enter into agreements with holders of FERC certificates of convenience and necessity for payment on project loans. The amount of the loans would not exceed 80% of total capital costs or \$18 billion.

Moreover, the accelerated depreciation tax credit contained in the bill allows pipeline owners to claim construction costs on their taxes over seven years instead of 15 years. A proposed North Slope gas conditioning plant is eligible for a tax credit worth \$295 million over the same period.

"After working for more than 20 years to make this pipeline project a reality, we have finally taken steps to make the Alaska natural gas pipeline happen," says Sen. Ted Stevens (R-Alaska), who credits both Sen. Lisa Murkowski (R-Alaska) and Rep. Don Young (R-Alaska) for their efforts in securing passage of the pipeline provisions.

Alaska Gov. Frank Murkowski also praises the state's congressional delegation, noting that it "has delivered on federal legislation that removes a large roadblock to our efforts to make progress in the commercialization of our gas resources." He cites their success in helping to "orchestrate an unprecedented federal response to what is regarded as the largest private sector construction project ever undertaken. If we're successful, it will mean jobs for Alaska families and a reliable source of energy for the American people."

Petroleum News reports that the state is currently negotiating with the major oil producers and TransCanada, and is beginning negotiations with energy distributor Enbridge, in addition to working with the Alaska Natural Gas Development Authority and the Alaska Gasline Port Authority.

Dave MacDowell, BP Exploration of Alaska gas pipeline spokesman, tells *Petroleum News* that passage of the gas pipeline provisions is "a posi-

tive development" and also applauds the state's congressional delegation "for their hard work and leadership on this effort." He explains, "Passage of these provisions will get us one step closer to the next phase of permitting and engineering, and that's the billion-dollar phase."

Because a significant portion of the new pipeline would come through Canada, MacDowell says BP hopes that "delivery of the U.S. federal legislation will help encourage development of an efficient Canadian regulatory process." He further states in *Petroleum News* that work continues on project costs and notes that BP and other oil production companies "continue to make progress on technology-led cost reduction efforts" such as high-strength steel, automated welding, and larger, more efficient trenching machines.

December 2004

DOE, Utilities, Independent Operators Launch Blackout Prevention Program

By Steven J. Storts
Dublin, Ohio

AS the August anniversary of last year's massive power blackout in the East and Canada quietly slipped by, a federal energy facility was busy putting the final touches on a new integrated data network that may help the aging transmission system weather future disruptions in the power grid.

The Eastern Interconnection Phasor Project—a monitoring program that the U.S. Department of Energy began developing with utilities and independent system operators (ISO) in 2002—went online this summer, providing the first real-time, systemwide data to utilities and transmission operators within the Eastern power grid.

"If this network had been in place last year, it may have helped system operators take steps to avoid the August 14 blackout," says Matt Donnelly, EIPP project leader at the U.S. Department of Energy's Pacific Northwest National Laboratory.

The project, which began installing equipment last fall, builds on PNNL's decade of experience developing a similar measurement and analysis system for the Bonneville Power Administration and utilities in the West.

PNNL manages the project for DOE as part of the Consortium for Electric Reliability Technology Solutions. CERTS members also provide technical support to an independent EIPP Work Group—a collaboration of utilities, system operators, vendors, and power system reliability councils working together to put the integrated network in place.

"This project is about gathering and sharing information to provide com-

plete coverage of the power grid in the eastern U.S.," Donnelly explains. With each incremental addition to the EIPP network, the equipment and software that has been installed will provide operators with a large picture of the grid over the eastern half of the country, referred to as the Eastern Interconnection.

Even though the transmission system is interconnected to route electricity between utilities, information has not been efficiently shared between those organizations in the past, DOE officials point out. As noted by the U.S.-Canada Power System Outage Task Force on the August 2003 blackout, there has been "no consistent means across the Eastern Interconnection to provide an understanding of the status of the power grid outside of a control area."

Mike Ingram of the Tennessee Valley Authority explains, "If operators can see a disruption or failure occurring elsewhere in the region, they can take actions that will potentially prevent a cascading loss of power from one system to the next. They may be able to reroute transmissions or bring extra power generation online."

To get this data, new measurement technologies employing satellite-based time clocks are being installed at key locations on the grid to measure power flows in real time. The precise time clocks, along with sophisticated signal processing, allow the meters to provide more information than can be derived from traditional instruments. EIPP participants believe this data can be used to help improve grid reliability, too.

Data concentrators then collect and integrate the precision data and dis-

seminate it to participants, while software analysis tools make sense of the real-time monitoring. Already, control centers near St. Louis; Columbus, Ohio; Chattanooga, Tennessee; New Orleans; and Schenectady, New York, have been linked through EIPP and have started sharing information.

The EIPP project is expected to cover and connect most major eastern U.S. corridors by the end of 2005. Together, participating utilities have invested about \$1 million toward the effort, with DOE providing about \$750,000. Utilities participating in the first phase of EIPP include Ameren, American Electric Power, Entergy, the Midwest ISO, the New York ISO with the New York Power Authority, and the Tennessee Valley Authority.

"DOE and the utilities are aggressively responding to recommendations in the blackout report, and we're expecting that EIPP will play a key role in preventing a repeat of last summer's blackout," Donnelly notes.

October 2004

Federal Energy Grants Propel New Research in Wind Power Industry

By Steven J. Storts
Dublin, Ohio

JUST as automotive manufacturers continually strive for better fuel economy in passenger vehicles, so, too, are companies developing better turbine systems in the small-but-growing wind power industry in the U.S.

Two West-based companies, Global Energy Concepts L.L.C., of Kirkland, Washington, and PYRAMatrix Structures Inc., of Salt Lake City, recently received \$100,000 grants from the U.S. Department of Energy, earmarked for investigations of the use of carbon fibers for two major wind turbine components: blades and towers.

The grants were awarded through DOE's Small Business Innovation Research program, which, together with the agency's Small Business Technology Transfer program, have resulted in \$25 million in research funding going to 187 small businesses in 32 states.

Global Energy will use its grant to develop technology for the production of wind turbine blades from carbon fibers. Although the blades are generally produced from fiberglass, carbon fiber technology could allow innovative blade designs that could lower wind energy costs at low wind speeds. Likewise, because turbine towers are typically made of steel, PYRAMatrix plans to develop taller, lighter towers made of carbon fibers, fiberglass, or a combination of the two materials.

By using a unique lattice structure in the composite materials, PYRAMatrix says it can reduce tower costs 37% for a 1.5-megawatt wind turbine, while cutting the weight 96%. For a 5-MW wind turbine, a 511-foot steel tower would weigh more than one mil-

lion pounds and cost more than \$3 million; the company claims that its composite towers would weigh only 30,000 pounds and cost about \$1.4 million. For now, the company will use its grant to focus on a tower for a 1.5-MW wind turbine.

Karen Conover, Global Energy chief executive officer, notes, "We anticipate completing the Phase I research in the next year and look forward to identifying innovative approaches to reducing the cost of energy from low wind-speed sites." After completion of this phase, the company will be eligible to compete in fiscal year 2003 for additional Phase II funding for research and development.

The 15-member, multidiscipline engineering and technology consulting firm provides services to clients worldwide involved in the energy industry, including solar, cogeneration, hydroelectric, geothermal, biomass, and ocean technologies. A well-known leader in the wind energy field, Global Energy specializes in the analysis, design, testing, and management of systems for both utility-scale and small-scale technological applications. In June, the company was recognized by the American Wind Energy Association for building "one of the most respected wind energy consultancies in the world."

Tracy Livingston, PYRAMatrix chief technical officer, says wind energy is becoming more competitive with coal power generation in terms of cost. She points out that PYRAMatrix's lighter-weight structures and ease of modular transport and assembly provide cost savings in manufacturing and erecting 1.5-MW to 5-MW turbine towers.

The company's technology incorporates the inherent strength of both composites and pyramids. By weaving composite material into pyramid lattices, the towers are 76% lighter than aluminum, 96% lighter than steel, and 25 times stronger. For example, a 47-foot PYRAMatrix tube 18 inches in diameter and weighing just 23 pounds supports almost 8,000 pounds or 350 times its weight. To support the same weight, a steel tube of the same dimensions weighs 1,875 pounds and supports only 4.3 times its weight.

For enhanced appearance and functionality, the towers can be sheathed to provide the tubular appearance of steel. Cold climates may also dictate sheathing to protect technicians climbing inside the 20-story-tall structures.

Design flexibility allows manufacture in several shapes—round, oval, tapered, or box beam—and in virtually any combination of off-the-shelf carbon fibers (including extremely high-temperature tolerance fibers), fiberglass, and resin materials. Product sizes range from three inches to beyond 20 feet in diameter and in lengths more than 300 feet.

The company has further identified promising applications where lighter-weight strength is critical, including electric utility transmission towers and distribution poles, radar towers, cell phone communication towers, construction tilt-wall braces, and deepwater off-shore drilling.

December 2002

FERC Approves Utilities Agreement To Upgrade Path 15 Transmission Line

By Steven J. Storts
Dublin, Ohio

IN a move to bring additional transmission capacity to congested electricity markets in California, the Federal Energy Regulatory Commission has approved an agreement that outlines cost-recovery and incentive proposals for a \$306 million upgrade to the state's constrained Path 15 transmission line.

The agreement filed by the Western Area Power Administration (WAPA), Trans-Elect Inc., and Pacific Gas & Electric Company (PG&E) calls for the addition of a new, 84-mile, 500-kilovolt transmission line by late 2004. This would increase transmission capability from 3,900 to 5,400 megawatts for northbound power deliveries. The capability of southbound deliveries would also increase.

FERC's action is intended to allow the Path 15 parties to move forward with financing and preliminary matters, but it is not the commission's final review of rates, terms, and conditions of the project. Also, although the commission has jurisdictional authority over transmission service, it does not have review authority over the siting and construction of transmission lines and upgrades.

Path 15, located in Northern California, consists of two, north-south high voltage transmission lines. These are often constrained because of the need for significant transmission of Pacific Northwest hydroelectric power moving south to California and electricity generation from Southern California traveling north.

In March 2001, FERC announced a series of across-the-board actions de-

signed to bring more economic and reliable energy supplies to the California and Western energy markets. At that time, the commission noted that a key element for market stability is investment in transmission facilities and proposed incentives such as an increased rate of return on equity. Federal energy officials point out that the need for additional transmission facilities in California has not eased since last year's order, which sought, among other things, to promote the timely construction of additional transmission facilities.

Under terms of the agreement, WAPA will own the new 500-kV transmission line and associated land and contribute about \$1.33 million to the project. PG&E will perform upgrades to pre-existing substations and transmission facilities. Trans-Elect, an independent transmission company, is responsible for raising about \$250 million of equity and debt to fund construction of the new transmission line.

FERC's order also grants PG&E a premium on return on equity and approves the company's request to use a 10-year accelerated depreciation schedule. As an incentive, WAPA, PG&E, and Trans-Elect will each receive entitlements to the transmission system rights, with the participants receiving about 10%, 18%, and 72%, respectively.

Meanwhile, Californians remain in their conservation mode. In fact, the California Energy Commission reports that this year's electricity demand levels will depend heavily on the extent that consumers continue their 2001 conservation patterns. Last year's conservation efforts by electricity consumers were substantial. This, coupled

with the addition of more than 2,000 megawatts of electricity from new power plants and moderate summer temperatures helped California avoid rolling blackouts.

Nevertheless, the California Independent System Operator indicated earlier this year that if the state experiences any hotter-than-expected temperatures, it may need to rely on increased energy imports and emergency mitigation measures to maintain required operating reserves.

The ISO's warning proved fortuitous as the summer's first bout with high temperatures effected the declaration of a Stage 2 electrical emergency in California, a clear indication that the state is still not prepared to meet its energy demand.

Critics and political adversaries of Governor Gray Davis and his handling of the state's energy crisis point to the delay or cancellation of numerous power plant projects as an indication of the long-term situation possibly worsening. To compound matters, energy needs during peak times are projected to grow by 8% over the next two years.

To help improve the energy picture, California's power companies, utility organizations, high-tech industry and manufacturing, and consumer advocates are calling for increased energy supply (more power plants and transmission lines) and accelerated conservation research.

Other remedies under consideration include shrinking the number of state regulatory agencies involved in siting new power plants; renegotiating the long-term power contracts that California signed; setting new benchmarks for reasonable electricity prices and re-

instating free choice to select energy providers; and getting small consumers to group together for volume discounts on power.

More optimistic signs could appear in the not-too-distant future. Already, the California Energy Commission has initiated a plan to work with the California Public Utilities Commission and other interested parties to improve the way electricity is measured, priced, and used within the state. A key element of the various proposals under consideration is that customers should have access to meters showing the actual costs of providing electricity.

Also, the concept of “distributed generation” is gaining support in California. This energy practice allows power systems to be located directly

on the premises of larger organizations or near office parks and other clustered areas. In general, distributed generation allows businesses to create their own power directly at the point of use, independently of the electricity grid, and without the need to build additional transmission and distribution lines.

Finally, in March the Henrietta Peaker Power Plant was licensed to begin project construction and is nearing completion. The 91.4-megawatt facility, the first new California power plant of 2002, will be located north of Path 15 to help offset the constricted flow of electricity between the northern and southern parts of the state.

September 2002

DOE Offers New Strategies for Improving Nation's Electrical Grid

By Steven J. Storts
Dublin, Ohio

IN response to a White House directive to evaluate the nation's electrical transmission infrastructure, the U.S. Department of Energy recently completed a study that targets improved reliability and reduced costs to consumers. At the heart of the year-long research is an assessment of whether to pursue establishing a national electrical grid, including an examination of all major transmission constraints and viable ways to remove them.

DOE's *National Transmission Grid Study 2001*, which examines the technical and economical issues resulting from electrical transmission bottlenecks, represents the Bush administration's proactive move toward producing more reliable, affordable, and environmentally clean energy.

Energy Secretary Spencer Abraham states, "Our objective is simple: to provide our citizens with a reliable supply of electricity at the lowest possible cost. We will work to unleash innovation and strengthen our markets to allow entrepreneurs to develop a more advanced and robust transmission system that meets the growing energy demand in the years ahead."

Historically, the transmission system was built by vertically integrated utilities that produced and transmitted electricity locally. Small interconnections between neighboring utilities existed, but they were generally created to increase reliability and share excess generation. However, today's competition in the wholesale electricity market has altered the manner in which electricity grids are being utilized. Those same transmission systems

that were historically designed to move power within small utility service territories are now frequently stressed to their limits by the movement of large blocks of power on a regional basis.

Unfortunately, these new patterns of power flow, continued electricity demand growth, and the lack of investment in transmission facilities have resulted in major transmission congestion across the U.S., the study notes.

Indeed, energy officials are quick to point out that diminished investments in electricity grids in recent years is a significant problem that needs addressing. Investment barriers include lack of regional integrated planning, difficulty in siting, and uncertainty regarding investment risks.

Recently, the Federal Energy Regulatory Commission called for the development of five regional transmission organizations. Once completed, the RTOs will formalize the regional planning process and are expected to manage the growth of the transmission system more efficiently. The DOE study calls for agency cooperation with the FERC and other stakeholders in developing objective standards for evaluating the performance of RTOs.

However, transmission investments go far beyond acquiring rights-of-way and building new power lines, Abraham explains. State-of-the-art metering and telemetry, upgrading control centers' computing capabilities, and installing new technology will also be necessary if consumers are to fully realize the efficiency gains from competitive wholesale electricity markets.

Still, even without significant modernization, and the failure of an outdated transmission system to keep

pace with electricity demand and investment in new generation facilities, market competition is reducing costs to consumers. In its study, the DOE found that wholesale electricity sales saves consumers nearly \$13 billion annually.

Despite these overall savings, though, Abraham reports that regional transmission congestion costs U.S. consumers millions of dollars annually. Further research shows that relieving bottlenecks in four regions (California, Philadelphia-Delaware-New Jersey, New York, and New England) could save consumers about \$500 million yearly.

DOE's study backs up what independent energy analysts have been advocating for nearly a decade—the elimination of transmission constraints and bottlenecks are essential to ensuring a reliable and affordable electricity market. The *National Transmission Grid Study 2001* contains 51 recommendations, six of which are strategies earmarked as the beginning steps toward improving the electrical transmission system.

First, regulatory certainty must be increased by completing the transition to competitive regional wholesale markets. Next, a process has to be developed for identifying and assessing national-interest transmission bottlenecks every two years. Third, the need for new transmission facilities can be avoided or delayed by improving current transmission system operations, fully utilizing existing facilities, and developing innovative programs that fund transmission-related research and development.

However, the study further emphasizes that regional planning processes

must consider all alternatives when trying to eliminate bottlenecks.

The fourth strategic recommendation calls for regional markets to coordinate opportunities for targeted energy-efficiency, distributed generation, and voluntary reductions in electricity demand. Next, there must be assurances that mandatory compliance with reliability rules will include enforceable penalties for violations that are commensurate with the risks created.

Finally, the DOE will take an increased leadership role in transmission R&D and policy by creating a new Office of Electricity Transmission and Distribution.

July 2002

California Energy Problems Still Continue As More Companies Do 'Less with Less'

By Steven J. Storts
Dublin, Ohio

THE best laid plans often . . . well, you know the story. There wasn't supposed to be an energy crisis in California. The heavily lobbied legislation that deregulated the state's electricity industry in 1996 was designed to bring competition, lower prices, and greater access to lower-cost surplus power generated in other parts of the country.

Most competition, though, requires a bargaining chip—a better product or service that no one else has or is willing to lay out on the table. California has none. There hasn't been a major power facility constructed in the state for more than 10 years. And buying cheaper energy out-of-state on the spot market in which you haven't been a major player isn't much to bargain with, either.

Although many stakeholders are reluctant to admit it, higher utility costs, not lower, lie ahead for most California consumers. Moreover, the response has been lukewarm to the state's recently approved plan to buy and sell electricity to consumers or possibly build state-owned power plants outside California.

For the first time since California's energy crisis began last summer, mandatory rolling blackouts have become reality. In January, the California Independent System Operator, the Sacramento-based agency that manages the capacity and flow of the state's power lines, ordered utilities in Northern California to reduce usage by 500 megawatts in 60-minute to 90-minute blackouts.

Although a temporary fix for the utilities, the power cutbacks are not

without their price, too. Rolling blackouts in the San Francisco Bay area last June 14 cost an estimated \$100 million in Silicon Valley. Consequently, high-tech manufacturers and the utilities have been scurrying to find ways to reduce consumption and prevent recurrences; they haven't found any viable solutions.

The residual costs of blackouts are not the only concern for companies. The *Los Angeles Times* reports that in addition to the recent rise in natural gas prices, California businesses could be jolted by an extra \$400 million in electricity surcharges due to possible temporary rate hikes and emergency purchases of out-of-state energy supply.

All this is part of the effort to help bail out the state's two largest utilities, Southern California Edison and Pacific Gas & Electric, which are caught between rising wholesale energy prices and fixed retail prices, the *Times* points out. Costs have risen dramatically for the electricity that Edison and PG&E must purchase from generating companies; yet, they cannot pass on these increases to consumers because of a rate-freeze mandated through statewide electricity deregulation.

Opinion columnist William Safire writes in the *New York Times*, "California's politicians deregulated half-way, which is the worst way: wholesale prices were freed from controls, but retail prices were not. Consumers remained seemingly protected, but the utility companies—which foolishly thought wholesale prices would go down forever—were enabled to buy on the spot market. Legislators, believing that they were protecting consum-

ers, forbade long-term contracts, which are hedges against sudden price fluctuations."

Aside from the utility debacle, many California business owners are more concerned about their own bottom lines, faced with some financially unattractive alternatives: soaring energy prices, continued blackouts, or both. From small companies to larger industries, the blackouts are an undeniable sign of the inability of California's power grid to meet the energy demand of its growing economy and population.

Still, many industries, from steel-makers to agribusinesses are coping with the current power outages, mostly by signing on to the state's energy conservation strategy of sharing and prolonging power resources by purposely using less electricity.

In exchange for production plant shutdowns to save electricity for other businesses, companies such as Fontana-based California Steel Industries Inc. have received price breaks from utility companies, the *Wall Street Journal* notes. However, the price breaks are considered little payback for California Steel, which is an "interruptible" electricity customer that must cease operations or face hefty fines when electricity supplies get critically low. The steelmaker had to shut down seven times last December alone, causing havoc on production schedules and worker productivity.

Company president Lourenco Goncalves told the *Los Angeles Times* that he is incensed that interruptible customers like him face the same increase of one cent per kilowatt-hour as other users. "This is very upsetting, very unfair," he says. "We bore the brunt of

crisis to keep the system up and running. The burden should be more evenly distributed.”

Competition is tight among the many high-tech and manufacturing industries located in California, and the lack of pricing power can be a major problem for companies that are continually being pressured by large customers to do more for less.

However, for some large commercial users, higher electricity prices are preferable to the recent barrage of electrical interruptions that have plagued California’s industrial base. Silicon Valley companies, which are among the biggest energy consumers in the state, have greeted rate increases with cautious praise, the *Times* reports.

“A temporary price spike can be managed. Unreliable power cannot,” says Michelle Montague-Bruno, a spokeswoman for the Silicon Valley Manufacturing Group. “What we’re trying to do is return the reliability of

the energy infrastructure in Silicon Valley.”

Keeping the major utilities financially healthy is part of that scenario, and that means some price increases, she adds. “Preliminarily, we believe the move will help return short-term stability to the market. No one wants high electricity rates, but we suspect the California Public Utilities Commission has made the right decision.”

Indeed, blackouts, plant shutdowns, and exhaustive energy conservation practices cannot go on forever, industry groups contend. Temporarily ceasing production is straining California businesses, making them vulnerable to permanently shutting down. However, companies aren’t necessarily relying on the state’s utility companies to provide dependable electricity to sustain their business interests, the *Wall Street Journal* adds. Some are considering their own contracts with energy suppliers outside the state.

And why not? Safire notes that in San Jose, epicenter of the computer industry’s drain on electric power, voters rejected a new power facility because it offended their “aesthetic sensibilities.” He cites “red tape and purple rhetoric” as the reasons why no major power facilities have been built in more than a decade in California.

“Environmentalists recoil in horror at suggestions of nuclear power, now a safe and clean source of electricity, or the use of cleaned-up coal to lower the price of natural gas that generates it,” Safire writes. “Reducing pollution sensibly is laudable, but clean-air extremists become local heroes without telling constituents the danger of the loss of Intel jobs and cheap electricity’s household convenience.”

March 2001

Roundtable Executive Outlines Support For Energy, Climate Policy Legislation

By Steven J. Storts
Dublin, Ohio

PRESENTING its case for a more realistic approach toward climate change policy, The Business Roundtable has told congressional leaders that breakthrough technologies offer the most effective response to concerns about greenhouse-gas emissions and meeting future worldwide environmental and energy needs.

"We are excited about the promise innovative technologies hold in helping to solve concerns about climate change," said BRT President Samuel Maury in testimony before the U.S. Senate Committee on Energy and Natural Resources. "And, we are deeply committed to turning this promise into reality."

Testifying in support of energy legislation, S. 882, the Energy and Climate Policy Act of 1999, and S. 1776, the Climate Change Energy Policy Response Act, Maury emphasized that the Kyoto Protocol is "certainly not the answer and is more likely to impede development of the very technologies needed to curb harmful greenhouse-gas emissions."

The roundtable endorses what it considers to be the more realistic, targeted approach being advanced in the Senate bills, which aim to spur the development of energy-saving technologies to address concerns about global climate change. Both S. 882, sponsored by Frank Murkowski (R-Alaska), and S. 1776, sponsored by Larry Craig (R-Idaho), are undergoing subcommittee hearings.

"We need to focus on the long-term technological developments that will make a real difference on climate

change," Maury added. "Together, the Murkowski and Craig bills represent a comprehensive, positive approach that advances climate policy debate in a more viable path forward—one that is focused on the role of technology to meet the world's growing environmental and energy needs in the 21st century."

In view of the potential implications of the Kyoto Protocol, the roundtable in early 1998 launched a series of efforts to engage in a more independent view of the complex issue of climate change. Since then, Maury noted, BRT has undertaken a wide-ranging series of research activities, including in-depth studies in science, economics, and technology; sponsorship of conferences; and the release of white papers and reports.

"All these lead to the sound conclusion that technological advances are the real answer to concerns about climate change," he stated.

BRT advocates a climate change policy that fosters both near-term and long-term technology development and commercialization—a policy that first involves working with government and the private sector to identify and mitigate regulatory, trade, and tax barriers to rapid technological innovation, commercialization, and dissemination.

Maury's testimony not only emphasized the enormous potential of technology to improve energy and resource efficiency but cited several barriers to accelerating the emergence of new technologies and identified performance measures that can be applied to assure proper stewardship of taxpayer investments and subsidies. "There are also technological,

cost, and infrastructure challenges that must be overcome before these technologies can be successfully brought to market," he said.

In the regulatory area, BRT contends that more rapid approval times for energy-efficient and/or carbon-reducing technologies are necessary, and that more tax incentives should be applied toward the commercialization of innovative energy technologies. For example, one incentive opportunity might include making the environmental research and development tax credit permanent, while increasing the percentage allowance and carving out an exception to the *Internal Revenue Code* rule that requires U.S. companies to receive "value" for technology transferred to foreign subsidiaries.

"The most clear-cut, trade-related impediment is foreign tariffs on pollution management equipment and technology," Maury told congressional members.

According to the roundtable, both S. 882 and S. 1776 build on the Energy Policy Act of 1992, which was designed to promote broad-based participation in seeking improvements in energy efficiency and management of greenhouse-gas emissions. "Expanding the involvement to include small business and agriculture will assure that the base is broadened and that the system is simplified," Maury said.

However, he also pointed out that S. 882 should be amended to include the development of emissions accounting principles for the accurate, consistent, and reliable reporting of actual, measurable, and verifiable actions that reduce, avoid, or seques-

ter greenhouse-gas emissions. Consistent with these principles, he added, the accounting system should establish procedures upon which businesses can rely for validating and certifying reported actions.

“It is important that the private sector be engaged in trying to define the best path to commercializing technology,” Maury emphasized. “The requirement for cost sharing will add a level of accountability to the application of taxpayer support. While this approach is to be applied to new initiatives, it seems that a similar process would benefit the current programs that amount to about \$1.4 billion per year.”

The BRT president acknowledged his support for several provisions in S. 1776, one of which calls for an assessment of the many barriers to deploying new innovations that can help consumers and companies. “These must include regulatory, trade, tax, and policy disincentives,” he noted.

One such area that the roundtable has identified is the approach the U.S. Environmental Protection Agency is using in its new source review compliance effort. “We feel that EPA’s approach is counterproductive and undermines the interest in the regulated community in bringing new technology and processes into play,” Maury said.

He praised another provision in S. 1776 that establishes a pilot program to encourage the deployment of America’s best technology to international markets.” This is an important aspect of any comprehensive policy because the growth of greenhouse-gas emissions in the developing world is of major proportion,” Maury emphasized. “It is not clear which mechanisms will be most effective at achieving the greatest success, but this pilot program should provide some answers.”

October 2000