

Coal Leader

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We Like Our Black Jobs

Michael J. Quillen, Chairman of the Board, Alpha Natural Resources recently told conference attendees at the Eastern Coal Council's 31st annual meeting that coal is irreplaceable role in the energy mix. Since the 1973 energy crisis in America the use of oil has only increased by 15 percent; however, the use of electricity has increased by 115 percent. Although the economy is sluggish the projected electricity demand growth is the primary cause of the projected 3.9 percent growth in coal consumption in the electric power sector in 2010.

Quillen stated that coal's share in the energy market may shrink but will remain relevant; coal is the predominant fuel for future electricity generation, even in a low growth scenario. Coal's relevance in a



Michael J. Quillen

carbon constrained world is still viable. The United States remains the number two coal producer in the world second only to China even in a world

with capped CO₂. Coal accounts for nearly 30 percent of all global fossil fuel consumption and 37 percent of fossil fuel emissions of carbon dioxide. It is used primarily in the electric power sector where it provides over half of the primary energy input.

The Organization for Economic Co-operation and Development (OECD) OECD brings together the governments of countries committed to democracy and the market economy from around the world to support sustainable economic growth, boost employment, and maintain financial stability. The Organization provides a setting

where governments compare policy experiences, seek answers to common problems, identify good practice and

interdependence and increasingly global energy market and environmental issues make the IEA's relations with non-

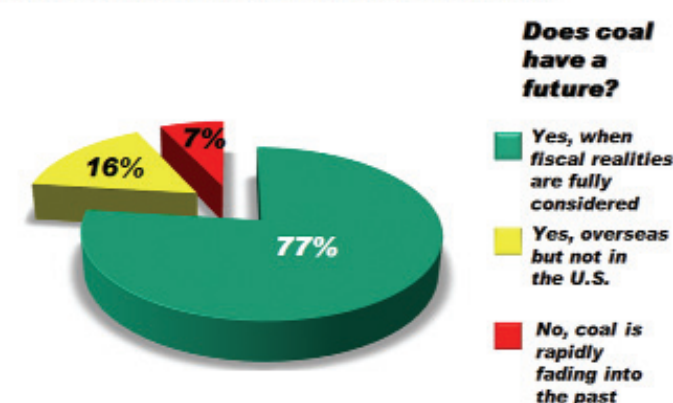
Member countries and international organizations especially important. Approximately half of the world's energy consumption now takes place outside the IEA area. Growth in world energy demand, particularly in the Asia-Pacific region, is expected to accelerate due to the continued growth of rapidly developing economies.

The Federal government is asking American industries to reduce CO₂ emissions to lev-

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Does coal have a future in the U.S.?

► Utilities agree on the future of coal when economics are fully considered



SOURCE: Black & Veatch, 4th Annual Strategic Directions in the Electric Utility Industry Survey, 02/18/10

coordinate domestic and international policies.

However, there are many countries that are not members of OECD, for instance China and India to name a couple, and the growing economic

DOE-Sponsored Field Test Demonstrates Viability of Simultaneous CO₂ Storage and Enhanced Oil Recovery in Carbonate Reservoirs

A field test conducted by a U.S. Department of Energy (DOE) team of regional partners has demonstrated that using carbon dioxide (CO₂) in an enhanced oil recovery method dubbed "huff-and-puff" can help assess the carbon sequestration potential of geologic formations while tapping America's valuable oil resources.

The Plains CO₂ Reduction (PCOR) Partnership, one of seven in DOE's Regional Carbon Sequestration Partnership program, collaborated with Eagle Operating Inc. to complete the test in the Northwest McGregor Oil Field in Williams County, N.D.

The huff-and-puff method of enhanced oil recovery proceeds in three phases: injection (the huff stage), "soaking" for a short period of time, and production (the puff stage). Compared to other huff-and-puff operations, the PCOR Partnership test was unique for several reasons:

• The depth (approximately 8,050 feet), was among the greatest.

• Pressure (3,000 pounds per square inch) and temperature (180 degrees Fahrenheit) were among the highest.

• The formation was a carbonate rather than clastic reservoir.

The test was conducted utilizing a producing oil well in the Mission Canyon Formation, part of the Madison Group of Mississippian-age carbonate rocks in the western United States. During the test, 440

tons of liquid CO₂ were injected into the well to a depth at which CO₂ is miscible and blends with residual in-place oil. Following 2 weeks of "soaking," the well was placed back into production.

Production more than doubled over the course of a 3-month period, increasing from a baseline rate of 1.5 stock tank barrels (STB) per day to 3-7 STB per day.

The percentage of oil in the produced fluid, commonly referred to as the "oil cut," also increased, more than doubling from less than 3 percent to 6 percent.

In addition to demonstrating the feasibility of combining CO₂ storage along with enhanced oil recovery in carbonate rocks deeper than

8,000 feet, the test determined that two Schlumberger technologies, a reservoir saturation tool (RST) and vertical seismic profiling (VSP), may be effective tools for detecting and monitoring small-volume CO₂ plumes in deep carbonate reservoirs to ensure safe and permanent sequestration. Project outcomes may be applicable to many other sites in the PCOR Partnership region and in similar settings globally.

The Regional Carbon Sequestration Partnerships initiative is a government-industry effort that is determining the best approaches for capturing and storing gases that can contribute to climate change.

The PCOR Partnership brings together more than 80

partners, consisting of public agencies, utilities, oil and gas companies, engineering firms, nonprofit organizations, and universities, in a region that includes all or part of nine U.S. states and four Canadian provinces. Led by the Energy and Environmental Center in Grand Forks, North Dakota, the PCOR Partnership has completed four small-scale validation tests and is currently conducting two large-scale development tests.

The Regional Carbon Sequestration Partnerships initiative is managed by the Office of Fossil Energy's National Energy Technology Laboratory.

EPA Adds Underground Coal Mines To List of GHG Reporters

By: Kathy Milenkovski
Steptoe & Johnson

On June 28, 2010, EPA Administrator Lisa Jackson signed a rule adding underground coal mines to the list of source categories required to report their greenhouse gas (GHG) emissions to EPA. The original GHG Reporting Rule, which was published in the Federal Register in October 2009, considered but did not include mines in the initial reporting program, which went



into effect January 1, 2010. Upon further consideration, EPA has decided to require GHG reporting from active underground coal mines as well as those under development. Abandoned mines, surface mines, and post-coal mining activities are not included.

On a quarterly basis, underground coal mine owners and

operators must report (1) methane liberated from each ventilation well or shaft and/or each centralized monitoring point; and (2) carbon dioxide emissions from coal mine gas methane destruction where the gas is not a fuel input for energy generation or use. On a weekly basis, they must report (1) methane liberated from each degasification system and/or each centralized monitoring point; and (2) methane destruction from each destruc-

tion device or point of offsite transfer. Finally, on an annual basis, mine owners and operators must report carbon dioxide and nitrous oxide emissions from stationary fuel combustion devices. In addition, if any additional emission sources at a facility fall within one of EPA's other GHG reporting source categories, those emissions must also continue to be reported.

Underground coal mines subject to the new rule must

begin monitoring GHG emissions on January 1, 2011, with the first reports due to EPA on March 31, 2012.

This rule will be effective 60 days after it is published in the Federal Register. If you have questions about how this rule affects you, please contact Kathy by email kathy.milenkovski@steptoe-johnson.com *cl*

Army Corps Yanks Appalachian Streamlined Surface Mining Program

The U.S. Army Corps of Engineers announced on June 17 that it will suspend the Nationwide Permit 21 program for coal mining operations in six Appalachian states, a move that will subject mining operations to lengthy permitting delays, threatening employment and energy supplies. The Corps announced its intent to withdraw the permit program

last year and held a series of public hearings to gauge public reaction to its proposed plan. "The National Mining Association is deeply concerned that the Corps of Engineers has moved forward with its previously announced intention to suspend Nationwide Permit 21 for coal mining in Appalachia over the opposition of thousands of



people who voiced their comments at public hearings earlier this year," said NMA President and CEO Hal Quinn in a June 17 statement. "They were concerned about their jobs, their economic future and the energy security of the nation. NMA shares those con-

cerns." Quinn emphasized that the nationwide permitting system, which applies to a wide range of economic activities, provides for a more efficient permitting process. "The current backlog of coal mining permits in Appalachia clearly demonstrates the consequences of eliminating this important regulatory tool," he said.

"This decision will slow job creation, add further uncertainty to the permitting process and undermine our ability to utilize the nation's most abundant domestic energy resource – coal," Quinn said. *cl*

EPA's Air Trend Data Shows Improvements

The Environmental Protection Agency has monitored the amount of certain particulates in the air on a national and local level with favorable results.

The EPA provides data on the amount of Carbon Monoxide, Ground Level Ozone, Lead, Nitrogen Dioxide, Particulate Matter,

and Sulfur Dioxide in various locations throughout the United States. Fortunately, the data demonstrates that over the past 20 years, the national average of the amount of the particulates in the air has decreased. The noted decrease in the national average from 1980 to 2008 is as follows: Carbon Monoxide has

decreased 79 percent, Ground Level Ozone has decreased 25 percent, Lead has decreased 92 percent, Nitrogen Dioxide has decreased 46percent and Sulfur Dioxide has decreased 71percent. From 2000 to 2008, Particulate Matter has decreased 19 percent. (Ground Level Ozone is not desired. Ozone (O3) is a gas

composed of three oxygen atoms. It is not usually emitted directly into the air, but at ground-level is created by a chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight.)

The EPA also makes the data available for specific

areas of the country. To access the data, visit www.epa.gov/airtrends. Then click on Carbon Monoxide, Ground Level Ozone, Lead, Nitrogen Dioxide, Particulate Matter, or Sulfur Dioxide, and select the state that is of interest. *cl*

WV Inventor Designs Roof Props with Discarded Tires

Ask Deloy Baker of Charleston, West Virginia how he came up with the idea of using discarded tires in mine roof props, and he will likely

grin and let you know that his "QC2 Modules" can be used for a lot more than holding up the roofs of underground mines. "The modules are relatively

inexpensive, they solve a problem of tire disposal, and they do a real good job of supporting very heavy loading."

Mr. De, as Baker insists you call him, has patented his process which stacks discarded tires in a rebar cage, which is then placed in an octagonal form that is filled with concrete. "The modules can be cast in just about any height, and we've used them as retaining walls and to stabilize stream banks," Mr. De says. He got the idea of putting the modules to use as roof props when he reasoned that the columns could be cheaper and as strong as conventional steel roof support systems. The Baker QC2s were shipped to NIOSH's Pittsburgh, PA test-

ing facility in December 2007 to determine just how they would perform in compression and shear testing. NIOSH tested Baker's 24 in., 36 in. and 42 in. high columns. The prefabricated modules were tested individually and stacked one on top of the other to simulate the manner in which they might be utilized in a working mine. The NIOSH lab concluded that "residual load capacities of the supports is significant." All of the tested columns maintained an average residual load capacity ranging from 700-800 kips. Single modules tested as high as 1895 kips, and when stacked, the modules tested as high as 1429 kips. Compressive strength of the single columns went as high as

3932 psi, while two stacked columns were tested as high as 2959 psi.

When the columns failed, the concrete "blew out" at the middle sections of the preformed columns, and the tire stack tended to retain a compressed load. NIOSH concluded that the QC2 module "has shown that it is capable of supporting very large loads."

Information about Mr. De's roof props or other applications of the QC2 preformed modules may be obtained from Deloy Baker, 4212 Crede Drive, Charleston, WV 25302 or www.bai-qc2.us. *cl*

www.coalleader.com

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Quillen - Cont from Page 1

els which cannot be reached. Steven L. Beshear said. CO2 is a telling historic perspective, not since William

“Kentucky industrial development has occurred because we

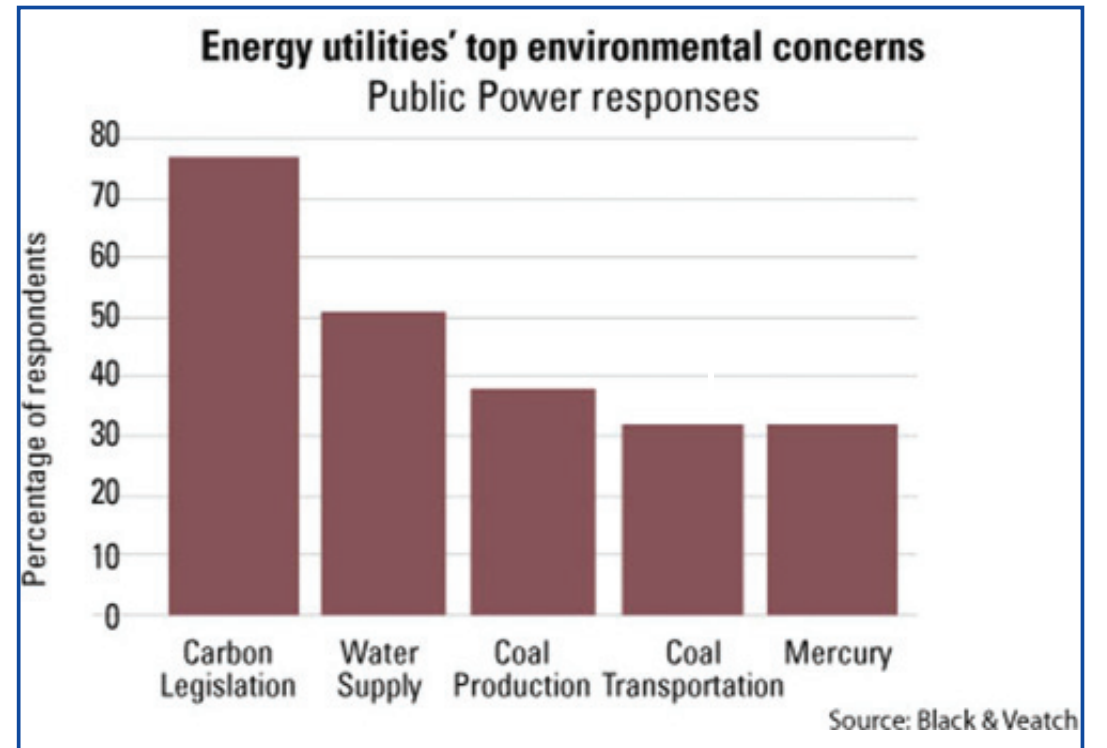
15 year purchasing contract in April from a utility, by which it will pay 20.7 cents /kWh including a mandated state subsidy of 6.1 cents /kWh for half the wind farm power. The cost will escalate 3.5 percent each year over the life of the contract. This is almost double the current rate and almost three times those states with significant coal fired generation. He talked about the economics of renewable: natural gas is .25 cents MWh; coal .44 cents.

Mike commented on a statement made by Robert Bryce, “Power Hungry: The Myths of ‘Green’ Energy and the Real Fuels of the Future” Bryce stated “On an average day, the energy output of Alliance Coal’s Cardinal mine is nearly equal, in raw terms, to the daily output of all the solar panels and wind turbines in the United States.” The Cardinal mine produces around 4 million tons a year.

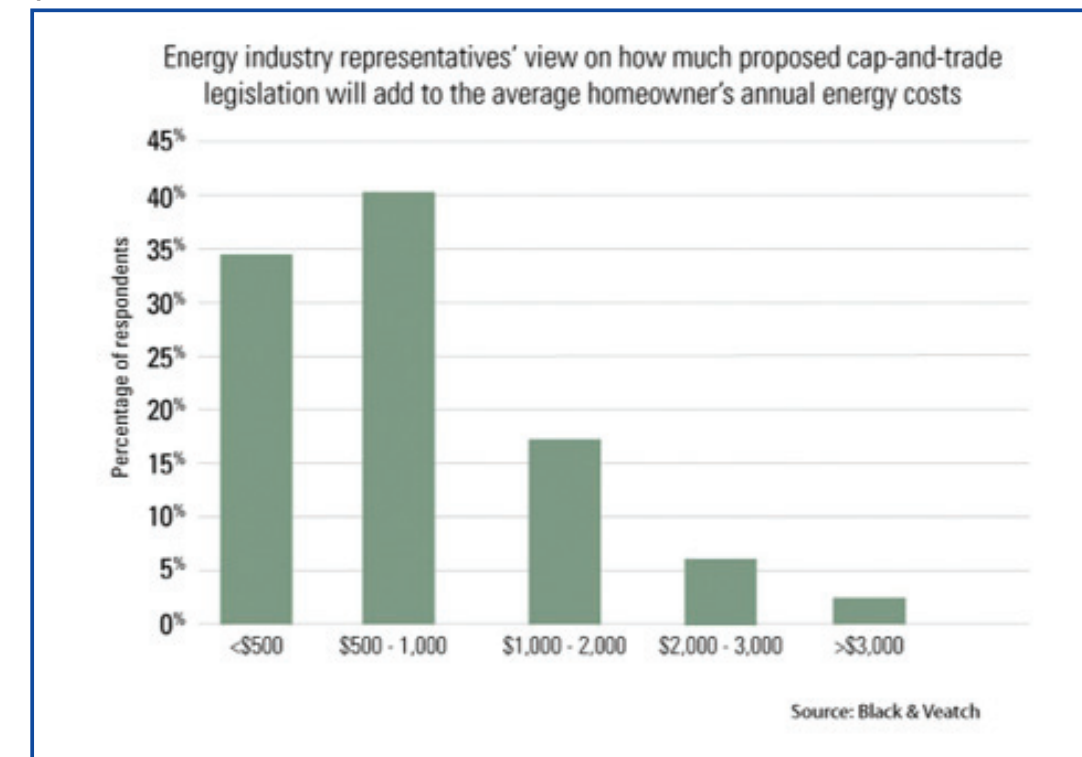
According to Black & Veatch’s 4th Annual Strategic Directions in the Electricity Utility Industry Survey the utilities agree on the future of coal when economics are fully considered, 77 percent said yes; 16 percent said yes, overseas not in the United States; and, seven percent said no, coal is rapidly fading into the past. There are many nations still afflicted by energy poverty. One and one half billion people, 22 percent of the world’s population have no access to electricity. Much of the world has ground to make up. The world’s largest populations lag far behind the United States in per-capita power consumption. The U.S. uses 3,366 watts per capita; China uses 673 watts per capita; Brazil uses 516 watts per capita, Indonesia uses 233 watts per capita; Pakistan uses 170 watts per capita; and India uses 167 watts per capita. The underdeveloped countries are adding capacity and eight out of ten new gigawatts of power plant construction underway in 2008 was coal fired. In 2010 China’s electricity is 80 percent coal-fired and India’s is 66 percent. Projects for 2030 show China’s electricity will be 77 percent and India’s will actually increase to 69 percent.

Quillen talked about the misconceptions concerning coal, for instance, we mine coal the

hard way, with shovels and pick axes; we no longer need coal, we have green energy don’t have anything against “green jobs” whatever that might be, but we like our black

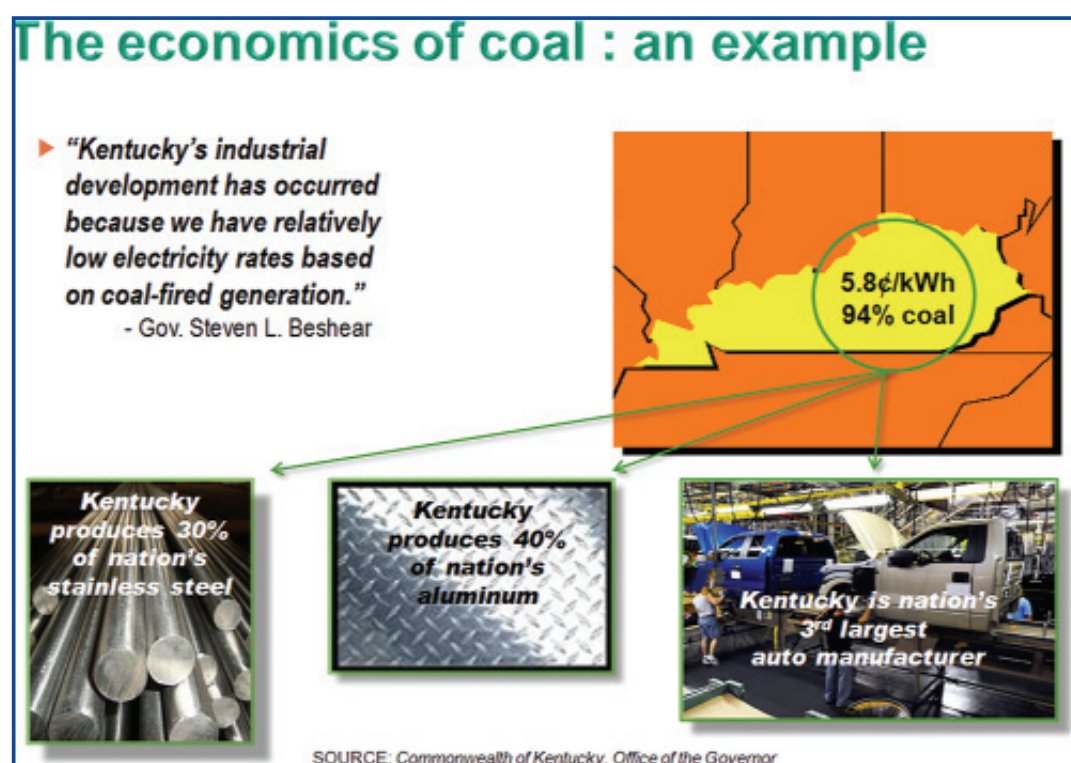


now; mining devastates communities, water and land; mining sustains poverty in Appalachia; and miners have jobs.” Alpha Natural Resources was founded in 2003 and has grown to become the



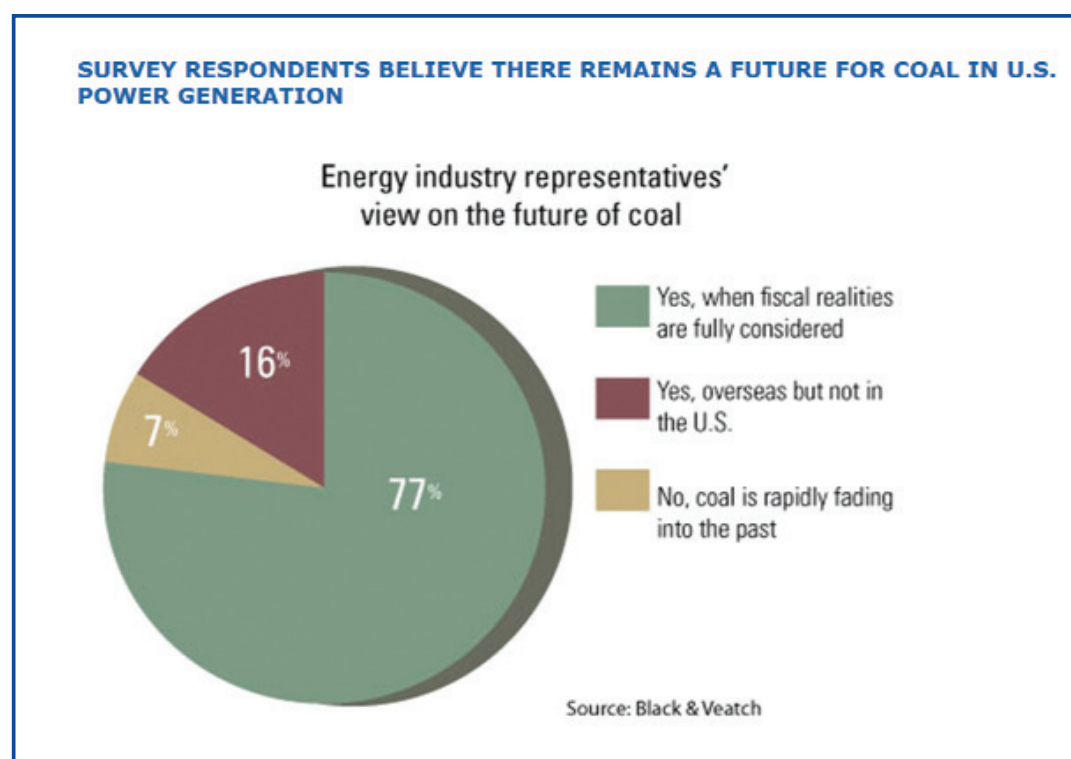
Howard Taft was president has the total U. S. carbon dioxide emissions been as low as specified by the America

have relatively low electricity rates based on coal-fired generation.” Kentucky produces 30 percent of the nation’s stain-



Power Act (Kerry-Lieberman). For instance a projected 420 million Americans living in 2050 will be held to the same overall emissions as 40 million

less steel, 40 percent of the nation’s aluminum and is the nation’s third largest automobile manufacturer. That’s thanks to an electricity rate 5.8



Americans emitted in 1875.

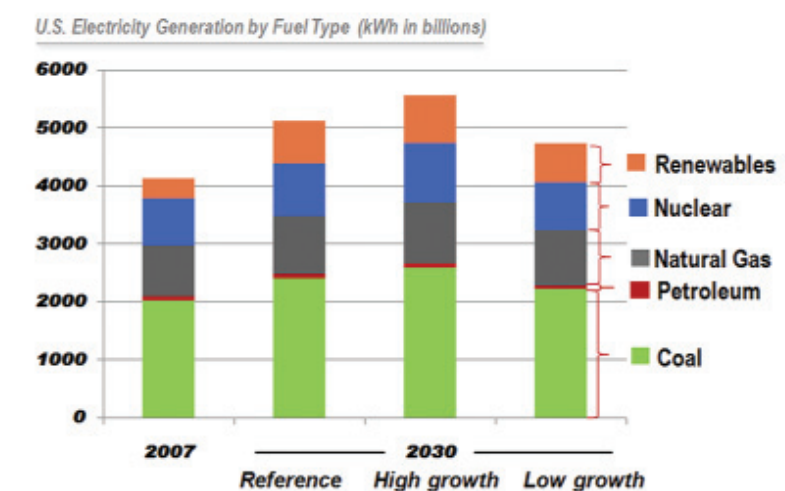
Quillen said states offering industries affordable electricity are more able to attract industrial development to their region. For instance Governor

cents/kWh and coal produces 94 percent of Kentucky’s energy.

Quillen went on to say Cape Wind, the nation’s first offshore wind farm wind was awarded a

Share may shrink...but coal remains relevant

► Coal is the predominant fuel for future electricity generation - even in a low-growth scenario



no choice but to work in the mines. As an industry we must change the public’s opinions about coal. He also sent a message to Congress that coal

America’s third largest coal supplier. Alpha owns 2.3 billion tons of reserves in four major coal basins; has combined revenues of \$4.2 billion (2008);

Regulatory and legal roadblocks are killing projects ...



miners do not need bailouts or stimulus funds. “We just want to mine coal safely and environmentally responsible, provide for our families and support the local communities. We

has more than 60 mines; market capitalization is \$4.7 billion; and, is the leading U.S. supplier of metallurgical coal to the world’s steel industry. *cl*

Eric Nielsen Joins Joy Global to Lead Strategic Planning & Acquisitions

Joy Global Inc. (NASDAQ: JOYG), a worldwide leader in high-productivity mining solutions, is pleased to announce that Eric Nielsen has joined the company as Executive Vice President, Business Development with primary responsibilities for strategic planning and acquisitions.

Mike Sutherlin, President and Chief Executive Officer of Joy Global stated, "I am pleased to welcome Eric to the Executive Leadership Team. An effective strategy and key acquisitions will play a major role in our future growth, and I

feel very fortunate that Eric brings extensive knowledge and leadership experience in the mining industry to these important functions at Joy Global."

Most recently, Mr. Nielsen was President of the Materials Processing and Mining Group of Terex Corporation. Prior to that, he was CEO of Volvo Construction Equipment's Excavator Division, based in South Korea. He holds a Bachelor of Science degree in Mechanical Engineering from Michigan Technological University and an MBA with



Eric Nielsen

emphasis in Finance and International Business from the

University of Chicago.

Mike Sutherlin added, "We can grow our business over the next several years by a combination of positioning ourselves in the highest growth segments of our markets, by continuing to introduce new products that safely increase productivity for our customers, and by acquiring product lines that are highly valued by our customers. Our ultimate success will be determined by our customer's view of us as their most critical and best supplier. I am confident that Eric will deliver strong results against this measure."

Joy Global Inc. is a world-wide leader in high-productivity mining solutions. Through its market-leading businesses, P&H Mining Equipment and Joy Mining Machinery, the Company manufactures and markets original equipment and aftermarket parts and services for both the underground and above-ground mining industries and certain industrial applications. Joy Global's products and related services are used extensively for the mining of coal, copper, iron ore, oil sands, gold and other mineral resources. *d*

AEP Names Pauley President Of Kentucky Power

American Electric Power (NYSE: AEP) has named Gregory G. Pauley president and chief operating officer of Kentucky Power, effective Aug. 1. Pauley currently is director - Public Policy for AEP.

Pauley will have responsibility for AEP's operations in Kentucky and will report to Charles Patton, president and chief operating officer of Appalachian Power. He will be replacing Tim Mosher, who is retiring.

"Greg's leadership skills and his extensive experience in the public policy arena combined with his experience managing distribution operations will benefit our Kentucky employees and customers. Greg is looking forward to returning to Kentucky, and I know his understanding and love of the Commonwealth will serve us well as we work to continue providing reliable, reasonably priced electricity in a still-struggling economy," Patton said.

Pauley, 58, has been director - Public Policy for AEP since 2006, working on policy issues impacting the electric utility industry on a national level. From 2001 to 2006, he was governmental and environmental affairs manager for AEP in Frankfort, Ky. Pauley was community services manager for AEP in Athens, Ohio, from 2000 to 2001, and from 1987 to 2000, he served as district manager in the Cambridge and Athens, Ohio areas. Pauley

joined AEP in 1974 and worked in Human Resources and Accounting in several AEP locations in Ohio from 1974 to 1987.

Pauley earned a bachelor's degree in business management from Harding University in Searcy, Ark. He is a graduate of management development programs at Ohio State University and Virginia Tech. He also is a graduate of the Ohio Electric Utility Institute Leadership Academy. Pauley

serves as chair of the Edison Electric Institute Government Affairs Committee and is a member of the Utility Advisory Committee of the Southern States Energy Board. He serves on the Intergovernmental Affairs Committee of the Council of State Governments and on the Energy, Environment and Agriculture Task Force of the American Legislative Exchange Council. *d*

Award-Winning DOE Technology Scores Success in Carbon Storage Project

The ability to detect and track the movement of carbon dioxide (CO₂) in underground geologic storage reservoirs, an important component of carbon capture and storage (CCS) technology, has been successfully demonstrated at a U.S. Department of Energy (DOE) New Mexico test site.

The SEQUE(TM) tracer technology, developed by scientists at the Office of Fossil Energy's (FE) National Energy Technology Laboratory, was successfully tested at the San Juan Basin coalbed test site. SEQUE uses perfluorocarbon tracers (PFTs) – non-toxic, chemically inert clear colorless liquids – to provide a verifiable

way to measure CO₂ movement as well as provide leak detection.

Research demonstrating and confirming long-term CO₂ storage security is an important precondition to large-scale deployment of CCS, considered by many scientists as a significant part of a portfolio approach to helping meet the global climate change challenge.

At the San Juan Basin, the SEQUE tracers detected gas first in the eastern-most of three production wells and then in the southwest production well. Numerical models used for the test site had predicted the CO₂ movement but indicat-

ed that the movement would initially occur at the southwest well.

***"Tracers Track
Subsurface
Movement of CO₂
at
New Mexico
Pilot Test Site"***

The tracer technology proved invaluable as a tool to improve modeling techniques vitally important in defining storage capacity, injection capability, flow rates, and num-

bers of wells associated with sequestration sites. The technology can measure concentrations as small as parts-per-quadrillion and differentiate injected CO₂ from natural CO₂.

DOE and its Southwest Regional Partnership (SWP) began injecting about 35,000 tons of CO₂ into the San Juan coalbed to maximize permanent storage of CO₂, while simultaneously recovering natural gas. Injecting CO₂ into the coalbed displaces the methane and makes it easier to produce. The San Juan Basin is considered one of the best sites worldwide for coalbed methane recovery, as well as a prime

site for CO₂ sequestration. The site contains three coalbed methane-producing wells and a central injection well.

In 2009, the patent-pending SEQUE technology earned R&D Magazine's prestigious R&D 100 Award, emblematic of one of the top 100 most significant products introduced to the marketplace during the past year. It received its first R&D 100 Award in 2007 as a major breakthrough in carbon storage and was touted as the only commercially available technology capable of searching vast areas for abandoned oil and gas wells in reservoirs having the potential to store CO₂. *d*

Coal Leader Coal Industry News

Harvey Retains Posts as President and CEO; Whitmire Becomes Vice Chairman Baxter Becomes Lead Independent Director

CONSOL Energy Inc. (NYSE: CNX) announced recently that J. Brett Harvey, the president and CEO of CONSOL Energy, has been appointed with the additional responsibilities as chairman of the board.

With the change, John Whitmire, the current chairman, now becomes vice chairman of the board.

"I am very honored to be given this added responsibility, and for following John Whitmire, who has been chairman since CONSOL Energy first became a public company in 1999," said Brett Harvey. "Under his leadership, CONSOL Energy realized a total shareholder return of approximately 616 percent, which illustrates the fine job he has done during his tenure on behalf of our shareholders.

"John and I have worked very closely together over the years, and as I take on the additional role of chairman, I expect that our close working relationship will continue."

In other action pertaining to the change, CONSOL Energy's Board of Directors also appointed Philip W. Baxter as the lead independent director. Mr. Baxter has more than 30 years of energy industry experience. William E. Davis, the chairman of the Nominating and Corporate Governance Committee of the Board, said, "With Phil's service as a member of our Board and the board of directors of CNX Gas Corporation, our subsidiary, for the past 12 years collectively, he is ideally suited for the position of lead independent director."

Mr. Harvey has been president and chief executive officer

and a director of CONSOL Energy since January 1998. With more than 30 years of experience in the energy industry, Mr. Harvey is especially qualified to understand the risks and leadership challenges facing a leading, diversified energy company like CONSOL Energy. Mr. Harvey also brings substantial corporate governance expertise to the CONSOL Energy Board of Directors, which he has acquired through his years of service on multiple public company boards.

DOE Signs Cooperative Agreement for Carbon Capture Project

The U.S. Department of Energy has signed a cooperative agreement with NRG Energy Inc. (NRG) for the Parish Post-Combustion CO2 Capture and Sequestration Project to design, construct, and operate a system that will capture and store approximately 400,000 tons of carbon dioxide (CO2) per year. The project, which will be managed by the Office of Fossil Energy's National Energy Technology Laboratory, was selected under DOE's Clean Coal Power Initiative, a collaboration between the federal government and private industry working toward low-emission, coal-based power generation technology.

The project team aims to demonstrate that post-combustion carbon capture can be economically applied to existing power plants—particularly those having the opportunity to sequester CO2 in nearby oil fields—and the viability of sequestration in such formations. The technology would apply to many additional coal-based electric power plants in the United States and throughout the world.

The system will employ Fluor's Econamine FG Plus technology to capture at least 90 percent of the CO2 from a 60-megawatt (MW) flue gas stream of the 617-MW Unit 7 at

the W.A. Parish Generating Station located in Thompsons, Texas. Fluor's Econamine FG Plus CO2 capture system features advanced process design and techniques, which lower the energy consumption of existing amine-based CO2 capture processes by more than 20 percent. The captured CO2 will be compressed and transported by pipeline to a mature oil field for injection into geologic formations for permanent storage through an enhanced oil recovery operation. The site will be monitored to track the migration of the CO2 underground and to establish the permanence of sequestration.

NRG's engineering partner Sargent & Lundy, in conjunction with Ramgen, is also developing efficiency improvements in various balance-of-plant processes, including steam production and CO2 compression, to reduce energy demands of the system. The University of Texas will contribute their expertise to the project by developing and testing an advanced solvent used to capture the carbon dioxide. The University of Texas, Bureau of Economic Geology will provide expertise with design of carbon management and plant monitoring.

The total project cost is \$334 million with the DOE share of the cost being \$167 million, or 50 percent of the total. Sequestration will begin in 2014, with project completion set for 2017.

IEA Says Expansion of Nuclear Energy is a Key Contributor to Combating Climate Change

According to the central finding of the Nuclear Energy Technology Roadmap, published recently by the International Energy Agency (IEA) and the OECD Nuclear Energy Agency (NEA) almost one quarter of global electricity could be generated from nuclear power by 2050. Such

an expansion will require nuclear generating capacity to more than triple over the next 40 years, a target the roadmap describes as ambitious but achievable.

Speaking from the East Asia Climate Forum in Seoul, IEA Executive Director Nobuo Tanaka said: "Nuclear energy is one of the key low-carbon energy technologies that can contribute, alongside energy efficiency, renewable energies and carbon capture and storage, to the decarbonization of electricity supply by 2050." NEA Director General Luis Echávarri stated: "Nuclear is already one of the main sources of low-carbon energy today. If we can address the challenges to its further expansion, nuclear has the potential to play a larger role in cutting CO2 emissions."

The roadmap finds that nuclear power is a mature, low-carbon technology that is ready to expand rapidly over the coming decades. The latest reactor designs, now under construction around the world, build on over 50 years of technology development. The roadmap notes that these designs will need to be fully established as reliable and competitive electricity generators over the next few years if they are to become the mainstays of nuclear expansion after 2020.

Financing the construction of new nuclear plants is expected to be a major challenge in many countries. In some cases, governments may need to support nuclear investment through measures such as loan guarantees until nuclear power programs are well-established. The industrial capacities and skilled human resources necessary to build, operate and maintain nuclear plants will also need to be increased over the next few years if nuclear is to expand rapidly.

Nuclear generating capacity worldwide is presently 370 gigawatts electrical (GWe), providing 14% of global electricity. In the IEA scenario for a 50% cut in energy-related CO2 emissions by 2050 (known as

the "BLUE Map" scenario), on which the roadmap analysis is based, nuclear capacity grows to 1 200 GWe by 2050, providing 24% of global electricity at that time. Total electricity production in the scenario more than doubles, from just under 20 000 TWh in 2007 to around 41 000 TWh in 2050.

Arch Coal's Skyline Mine Earns Multi-State RMCMI Safety Award for Fourth Consecutive Year

Arch Coal, Inc. (NYSE: ACI) recently announced that Skyline mine has earned top honors for underground mine safety among an eight-state region for a fourth consecutive year.

The Rocky Mountain Coal Mining Institute (RMCMI) awarded the employees of Skyline mine with the 2010 Safety Award for underground mines due to an outstanding and ongoing safety performance achieved during calendar year 2009.

"This ongoing safety performance is proof positive of the dedication of the men and women of Skyline," said John W. Eaves, Arch's president and chief operating officer. "Day in and day out they live by their safety values and for this they can be very proud."

Canyon Fuel Company is a wholly owned subsidiary of Arch Coal, Inc. Canyon Fuel's Skyline mine is located near Helper, Utah, and employs about 215 people. Skyline sold a total of 10 million tons of coal during the four-year period from 2006 to 2009.

St. Louis-based Arch Coal is the nation's second largest coal producer. The company's core business is providing U.S. power generators with cleaner-burning, low-sulfur coal for electric generation. Through its national network of mines, Arch supplies the fuel for approximately 8 percent of the electricity generated in the United States.

BIG DOG HOUSEBOAT



2005 Sharp Houseboat 92'x18'
Custom built showboat
4 bedrooms w/ 2 full baths
fiberglass party top and roof bar
Offers all of the lavish amenities on the water.
A must see, one of a kind luxury houseboat.
\$475,000. Larel Martine – South Holston Lake, Bristol, VA.
PHONE: 423-340-1069

A Manufacturing Strategy for Jobs

By: John Engler, President and CEO
 National Association of Manufacturers

America's prosperity and strength are built on a foundation of manufacturing. Manufacturers create, innovate and employ millions of Americans in some of the best jobs our country has to offer. The United States continues to stand strong as the No. 1 manufacturing economy in the world, producing 21 percent of global manufacturing wealth. Nearly 12 million Americans work in the manufacturing sector, earning 22 percent more in wages and benefits than the rest of the workforce.

But U.S. leadership in manufacturing is under fire, facing its toughest competition in the nation's history. States used to battle each other to recruit new factories and manufacturing jobs. Today, states go head-to-head against foreign governments that can use all the tools of government to support industry. Our states, and the U.S., are being outgunned. Yet we have no battle plan, no comprehensive approach for making manufacturing in the

United States more competitive, more productive and creating even more high-paying jobs. The unprecedented challenge to U.S. manufacturing pre-eminence requires clear thinking, a global vision and a plan. The United States needs a manufacturing strategy, a Manufacturing Strategy for Jobs and a Competitive America.

For years, Washington has tried to encourage industry with legislation, government initiatives and small fixes. Some produced benefits; others caused harm. And the reality is that the United States lost 2 million manufacturing jobs during the latest recession. A manufacturing strategy will take a comprehensive view of what is needed for manufacturing in America to succeed in the face of global competition. Such a strategy should set high goals:

- The United States will be the best country in the world to headquarter a company. We want companies to be based in the United States.
- The United States will be the best country in the world to



place to manufacture, both to meet the needs of the American market and serve as an export platform for the world.

A strategy assesses the strengths of the competition. Through tax and trade policy, Europe's leaders foster their industries' investment and innovation. China's entire economic program is based on the export of manufactured goods; the rising powers of India and Brazil aggressively protect and promote their domestic manufacturing companies. Across the globe in Asia, Europe, South America, Canada, and Australia, nations are negotiating trade agreements that expand their access to customers and markets to the dis-

innovate, performing the bulk of a company's global research and development.

- The United States will be a great

advantage of manufacturers in the United States. These countries strategize for success.

The U.S. response has fallen short of the challenge. Some in the United States have given up on manufacturing, believing, "We just don't make things anymore." Others react passively, assuming things will work out. Others, claiming to promote the "right" manufacturing jobs, propose new taxes, regulations and government programs that make it harder for existing businesses to add new employees. The Manufacturing Strategy for Jobs and a Competitive America, lays out a comprehensive plan for supporting jobs and the U.S. manufacturing economy. The strategy proposes policy changes that, taken as a whole, will allow manufacturers in the United States to compete effectively in the global marketplace. The strategy highlights the need for:

- Tax policies to bring America more closely into alignment with major manufacturing competitors

- Government investments in infrastructure and innovation

- Trade initiatives to reduce barriers and open markets to U.S. exports

The strategy calls for comprehensive action on critical priorities such as energy, education and regulation, while pointing out where misguided policies would undermine the strategy's proposals for positive change. The Manufacturers call on members of Congress, candidates for office and opinion leaders to join us in supporting and publicly endorsing this comprehensive strategy. Most importantly, once elected, advocates for manufacturing should seek to implement the strategy through their actions and votes.

America's vitality, innovation, prosperity and jobs spring from manufacturing. To preserve and build on that greatness, it is time for our nation to embrace this Manufacturing Strategy for Jobs and a Competitive America. For the complete report visit www.nam.org

AEP Announces Executive Leadership Changes

American Electric Power (NYSE: AEP) will make executive leadership changes to support the company's strategic goals and streamline operations, according to Michael G. Morris, chairman, president and chief executive officer.

Charles Patton, 50, has been named president and chief operating officer of Appalachian Power. Patton previously served as executive vice president - AEP Utilities West. Patton will succeed Dana Waldo, who is retiring from the company.

Patton also will oversee the operations of Kentucky Power. Tim Mosher, president and chief operating officer of Kentucky Power, also is retiring from the company. Mosher's replacement will report to Patton.

Venita McCellon-Allen, 50, has been named president and chief operating officer of Southwestern Electric Power Co. (SWEPCO). She previously served as executive vice president - AEP Utilities East. McCellon-Allen will succeed Paul Chodak, 46, who will move to Indiana Michigan Power as president and chief operating officer, replacing Helen Murray, who is retiring from the company.

Pablo Vegas, 37, has been named AEP's vice president and chief information officer. He previously served as president and chief operating officer of AEP Texas. Vegas will succeed Velda Otey, who is retiring from the company. McCellon-Allen also will coordinate the operations of AEP Texas. A replacement for

Vegas will be named in the near future, reporting to McCellon-Allen.

"Dana, Tim, Helen and Velda each have made significant contributions to AEP during their many years with the company, and we wish them continued success as they begin new chapters in their lives," Morris said. "Their decisions to retire and our overall initiative to reduce costs make this the right time to realign our reporting structure and eliminate a management layer between Bob Powers, president - AEP Utilities and our operating company presidents. This change will give our operating company presidents increased responsibility and a more direct role in the planning and budgeting process for capital projects within each operating area.

"Venita, Charles and Paul have demonstrated skills in leading our utility companies, and I know their experience will serve us well as we continue to manage the impact of the struggling economy and maintain our commitment to providing reliable, reasonably priced electricity service to our customers. Pablo's experience in heading our Texas operations will give him an expanded perspective as he returns to lead our Information Technology organization," Morris said.

Patton has been executive vice president - AEP Utilities West since October 2009, responsible for the distribution and customer service operations of AEP's utility operating companies in Arkansas, Louisiana, Oklahoma and

Texas. Previously, he was senior vice president - Regulatory and Public Policy. From 2004 to 2008, Patton was president and chief operating officer for AEP Texas. From 2002 to 2004, Patton was vice president of governmental affairs for AEP in Texas. He joined Central and South West Corp. (CSW) in 1995 as director of state government affairs. Prior to joining CSW, Patton spent nearly 11 years in the energy and telecommunications business. Patton received a bachelor's degree from Bowdoin College in Brunswick, Maine, and a master's degree from the LBJ School of Public Policy at the University of Texas in Austin.

McCellon-Allen has been executive vice president - AEP Utilities East since October 2009, responsible for the distribution and customer service operations of AEP's utility operating companies in Indiana, Kentucky, Michigan, Ohio, Tennessee, Virginia and West Virginia. She previously served as executive vice president - AEP Utilities West. From 2006 to 2008, she was president and chief operating officer of SWEPCO. She was senior vice president - Shared Services from 2004 to 2006, responsible for human resources, information technology and telecommunications, procurement and supply chain services, corporate services and enterprise security. Prior to that, she was senior vice president for human resources for Baylor Health Care System in Dallas. A 17-year veteran of CSW, McCellon-Allen held leadership

roles at CSW in operations, customer service, strategic planning and human resources. McCellon-Allen earned a bachelor's degree in journalism from Texas A&M University.

Chodak has been president and chief operating officer of SWEPCO since 2008. He began his career with AEP in 2001 as a senior project manager. From 2002 to 2007, he held leadership positions in Regional Engineering for Regulated Generation, Corporate Technology Development, Environmental Programs, and New Generation. Prior to joining AEP, he was a staff scientist at Los Alamos National Laboratory. Chodak received a bachelor's degree in chemical engineering from Worcester Polytechnic Institute prior to accepting a commission in the U.S. Navy, where he earned chief engineer and submarine officer qualifications. While in the Navy, he earned a master's degree in civil engineering from Virginia Polytechnic Institute. He earned a doctorate degree in nuclear engineering from the Massachusetts Institute of Technology.

Vegas has been president and chief operating officer of AEP Texas since 2008. Previously, he served as AEP's director of strategic planning within Corporate Planning and Budgeting. He joined AEP in 2005, holding leadership positions in Information Technology and Finance, leading both the Corporate IT Planning and Commercial Operations IT Planning organizations. Before

joining AEP, Vegas held senior leadership positions with IBM, PricewaterhouseCoopers and Andersen Consulting. He received a bachelor's degree in mechanical engineering from the University of Michigan.

American Electric Power is one of the largest electric utilities in the United States, delivering electricity to more than 5 million customers in 11 states. AEP ranks among the nation's largest generators of electricity, owning nearly 38,000 megawatts of generating capacity in the U.S. AEP also owns the nation's largest electricity transmission system, a nearly 39,000-mile network that includes more 765-kilovolt extra-high voltage transmission lines than all other U.S. transmission systems combined.

AEP's transmission system directly or indirectly serves about 10 percent of the electricity demand in the Eastern Interconnection, the interconnected transmission system that covers 38 eastern and central U.S. states and eastern Canada, and approximately 11 percent of the electricity demand in ERCOT, the transmission system that covers much of Texas. AEP's utility units operate as AEP Ohio, AEP Texas, Appalachian Power (in Virginia and West Virginia), AEP Appalachian Power (in Tennessee), Indiana Michigan Power, Kentucky Power, Public Service Company of Oklahoma, and Southwestern Electric Power Company (in Arkansas, Louisiana and east Texas). AEP's headquarters are in Columbus, Ohio. *cl*

CONSOL Energy Inc. Completes Acquisition of CNX Gas Corporation

CONSOL Energy Inc. (NYSE: CNX) recently announced that it has completed its acquisition of CNX Gas pursuant to a short-form merger in which CNX Gas became a wholly owned subsidiary of CONSOL. In connection with the merger,

all public stockholders of CNX Gas, other than those who validly exercise appraisal rights, will receive \$38.25 in cash for their shares. Letters of transmittal will be mailed shortly to registered holders along with the Notice of Merger. CNX

Gas's common stock will no longer be traded on the New York Stock Exchange beginning June 1, 2010. About CONSOL Energy CONSOL Energy, a high-Btu bituminous coal and natural gas company, is a member of

the Standard & Poor's 500 Equity Index and the Fortune 500. It was recently named one of the "Top 100 Most Trustworthy" companies for 2010 by Forbes. At year-end 2009, it had 11 bituminous coal mining complexes in six states

and reports proven and probable coal reserves of 4.5 billion tons. It is also the leading Appalachian gas producer, with proved reserves of 2.9 trillion cubic feet. *cl*

Large-Scale Industrial CCS Projects Selected for Continued Testing

Three Recovery Act funded projects have been selected by the U.S. Department of Energy (DOE) to continue testing large-scale carbon capture and storage (CCS) from industrial sources.

The projects, located in Texas, Illinois, and Louisiana, were initially selected for funding in October 2009 as part of a \$1.4 billion effort to capture carbon dioxide (CO₂) from industrial sources for storage or beneficial use. The first phase of research and development (R&D) included \$21.6 million in Recovery Act funding and \$22.5 million in private funding for a total initial investment of \$44.1 million.

The successful development of advanced technologies and innovative concepts that reduce CO₂ atmospheric emissions is a key objective of the Obama Administration's effort to help mitigate the effects of climate change. CO₂ is a major greenhouse gas and contribu-

tor to global climate change. CCS, which includes technologies for capturing, transporting, and permanently storing carbon dioxide emissions in geological formations, is viewed by many experts as an important part of a portfolio strategy for confronting the challenge.

The projects announced today are aimed at testing large-scale industrial carbon capture and storage, an important step in moving CCS technology toward eventual commercial deployment. In 2009, the industrial sector accounted for slightly more than one-quarter of total U.S. CO₂ emissions of 5,405 million metric tons from energy consumption, according to data from DOE's Energy Information Administration.

The three projects are expected to capture and store a total of 6.5 million tons of CO₂ per year, and increase domestic production of oil by more than 10 million barrels of

oil per year by the end of the demonstration period in September 2015.

Following successful completion of their Phase 1 activities, the three projects will now enter into Phase 2 for design, construction, and operation. The second phase of these projects includes \$612 million in Recovery Act funding and \$368 million in private sector cost-sharing for a total investment of \$980 million. The projects will be managed by the Office of Fossil Energy's National Energy Technology Laboratory (NETL). CCS research is a major focus of the FE/NETL research program. Potential additional applications for funding of large-scale industrial carbon capture and storage projects are pending further clarification and review. Descriptions of the selected projects follow:

- Air Products & Chemicals, Inc. (Allentown, PA) —Air Products will partner with

Denbury Onshore LLC to capture and sequester 1 million tons of CO₂ per year from existing steam-methane reformers in Port Arthur, Texas, starting in November 2012. Air Products will transport the captured gas to oil fields in eastern Texas by pipeline where it will be used for enhanced oil recovery. The project team includes Air Products & Chemicals, Denbury Onshore LLC, the University of Texas Bureau of Economic Geology, and Valero Energy Corporation. (DOE share: \$253 million)

- Archer Daniels Midland Company (Decatur, IL)—The project will capture and sequester 1 million tons of CO₂ per year from an existing ethanol plant in Illinois, starting in August 2012. The CO₂ will be sequestered in the Mt. Simon Sandstone, a well-characterized saline reservoir located about one mile from the plant. The project team

includes Archer Daniels Midland, Schlumberger Carbon Services, and the Illinois State Geological Survey. (DOE share: \$99 million)

- Leucadia Energy, LLC (New York, NY)—Leucadia and Denbury Onshore LLC will capture and sequester 4.5 million tons of CO₂ per year from a new methanol plant in Lake Charles, La. The CO₂ will be delivered via a 12-mile connector pipeline to an existing Denbury interstate CO₂ pipeline and sequestered via use for enhanced oil recovery in the West Hastings oilfield, starting in April 2014. The project team includes Leucadia Energy, Denbury, General Electric, Haldor Topsoe, Black & Veatch, Turner Industries, and The University of Texas Bureau of Economic Geology. (DOE share: \$260 million)

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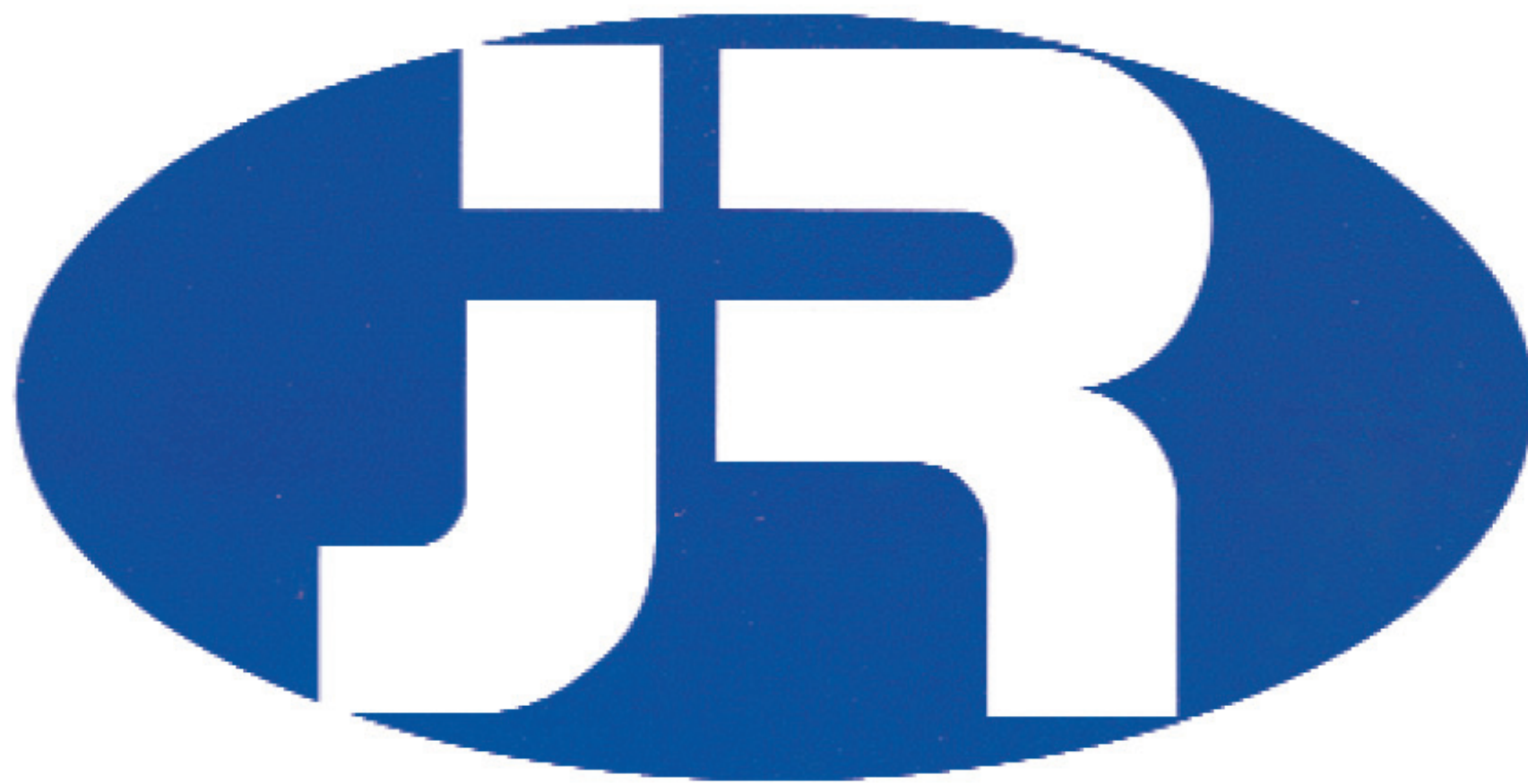
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Award-Winning DOE Technology Scores Success in Carbon Storage Project

The ability to detect and track the movement of carbon dioxide (CO₂) in underground geologic storage reservoirs, an important component of carbon capture and storage (CCS) technology, has been successfully demonstrated at a U.S. Department of Energy (DOE) New Mexico test site.

The SEQUIRE(TM) tracer technology, developed by scientists at the Office of Fossil Energy's (FE) National Energy Technology Laboratory, was successfully tested at the San Juan Basin coalbed test site. SEQUIRE uses perfluorocarbon tracers (PFTs) – non-toxic, chemically inert clear colorless liquids – to provide a verifiable way to measure CO₂ movement as well as provide leak detection.

Research demonstrating and confirming long-term CO₂ storage security is an important precondition to large-scale deployment of CCS, considered by many scientists as a significant part of a portfolio approach to helping meet the global climate change challenge.

At the San Juan Basin, the SEQUIRE tracers detected gas first in the eastern-most of three production wells and then in the southwest production well. Numerical models used for the test site had predicted the CO₂ movement but indicated that the movement would initially occur at the southwest well.

The tracer technology proved invaluable as a tool to improve modeling techniques

*“Tracers
Track
Subsurface
Movement
of CO₂ at
New Mexico
Pilot Test
Site”*

vitality important in defining storage capacity, injection capability, flow rates, and numbers of wells associated with sequestration sites. The technology can measure concentrations as small as parts-per-quadrillion and differentiate injected CO₂ from natural CO₂.

DOE and its Southwest Regional Partnership (SWP) began injecting about 35,000 tons of CO₂ into the San Juan coalbed to maximize permanent storage of CO₂, while simultaneously recovering natural gas. Injecting CO₂ into the coalbed displaces the methane and makes it easier to produce. The San Juan Basin is considered one of the best sites worldwide for coalbed methane recovery, as well as a prime

site for CO₂ sequestration. The site contains three coalbed methane-producing wells and a central injection well.

In 2009, the patent-pending SEQUIRE technology earned R&D Magazine's prestigious R&D 100 Award, emblematic of one of the top 100 most significant products introduced to the marketplace during the past year. It received its first R&D 100 Award in 2007 as a major breakthrough in carbon storage and was touted as the only commercially available technology capable of searching vast areas for abandoned oil and gas wells in reservoirs having the potential to store CO₂. *d*

Ground Control Technology for the Mining and Tunneling Industry



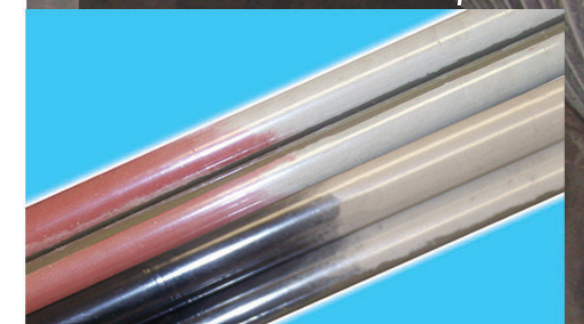
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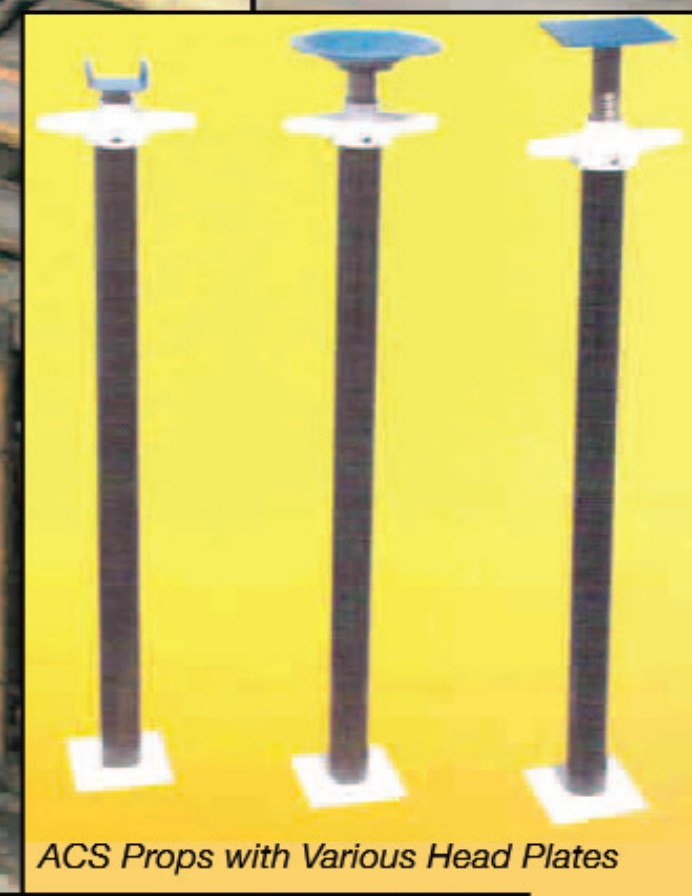
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Alabama Project Testing Potential for Combining CO2 Storage with Enhanced Methane Recovery

Field testing the potential for combining geologic carbon dioxide (CO2) storage with enhanced methane recovery is underway at a site in Alabama by a U.S. Department of Energy (DOE) team of regional partners.

Members of the Southeast Regional Carbon Sequestration Partnership (SECARB) are injecting CO2 into a coalbed methane well in Tuscaloosa County to assess the capability of mature coalbed methane reservoirs to receive and adsorb significant volumes of carbon dioxide (CO2). Southern Company, El Paso Exploration & Production, the Geological Survey of Alabama, and the University of Alabama are all participating in the field test, known as the Black Warrior CO2 Storage Project.

As part of carbon capture and storage (CCS) technology, geologic CO2 storage is considered by experts to be an important option – along with greater use of renewable and nuclear energy and enhanced efficiency – in a "portfolio" approach to reducing greenhouse gas emissions and helping mitigate climate change. The Black Warrior project will

help determine the feasibility of combining carbon storage and enhanced recovery of coalbed methane, a primary component of natural gas.

CO2 Storage in Black Warrior Basin

The SECARB members began injecting CO2 at the Alabama test site on June 15, 2010. Earlier, an existing coalbed methane well operated by El Paso Exploration & Production had been converted for CO2 injection, and four wells drilled to monitor reservoir pressure, gas composition, water quality, and the CO2 plume. The targeted coal seams are in the Pratt, Mary Lee, and Black Creek Coal groups within the upper Pottsville Formation and range from 940 to 1,800 feet in depth and from 1 to 6 feet in thickness. Two hundred and forty tons of CO2 will be injected over a 45- to 60-day period.

The site was selected because it is representative of the Black Warrior Basin, an area of about 23,000 square miles located in northwestern Alabama and northeastern Mississippi. Coal in the Black Warrior Basin has the potential to sequester 1.1 gigatons to 2.3 gigatons of CO2, approximately the

amount that Alabama's coal-fired power plants emit in two decades. Enhanced coalbed methane recovery combined with CO2 storage could squeeze another 1.5 trillion

*“Project by
DOE's
SECARB
Regional
Partnership
Assessing
Technologies
Important to
CCS”*

cubic feet of natural gas from these coal seams.

Surface and Subsurface CO2 Monitoring

During and following injection, the project will monitor the injected CO2 at the surface and in the subsurface to ensure that storage is safe and permanent. Three deep subsurface monitoring wells will

use pressure transducers and fluid sampling tubes to monitor the coal groups. While CO2 is injected into one coal seam, the others should display a minimal pressure response if the CO2 remains in the original coalbed. Pressures will also be monitored inside the well to ensure that there are no leaks. Shallow groundwater and soil gas monitoring will provide important information that can be used to evaluate the environmental safety of carbon sequestration and enhanced coalbed methane recovery operations in the Black Warrior Basin.

DOE's Regional Carbon Sequestration Partnership Program

DOE's Regional Carbon Sequestration Partnership program was created in 2003 to determine which of numerous carbon storage approaches are best suited for different regions of the country. The partnerships include more than 350 organizations, spanning 43 states, and four Canadian provinces.

The partnership program is being implemented in three phases. The characterization phase (2003–2005), which defined opportunities for car-

bon capture and storage, has been completed. The validation phase (2005–2010) generally involves small-scale field tests and includes the Black Warrior Basin CO2 Storage Project. The final phase, the development phase (2007–2018), will conduct large-volume carbon storage tests. The National Energy Technology Laboratory manages the partnership program for DOE's Office of Fossil Energy.

SECARB is led by the Southern States Energy Board and represents more than 100 partners and stakeholders in 13 southeastern states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia. SECARB is conducting four tests under the validation phase of the partnerships program and two large-volume carbon storage tests, including one in the Cranfield Oilfield in Mississippi in which more than one (1) million tons of CO2 have been injected to date in the saline portion of the reservoir—one of only five projects worldwide to have reached this milestone. *d*

16 WY Teachers Receive 2010 Arch Coal Golden Apple Awards

Sixteen Wyoming classroom teachers have earned Arch Coal Golden Apple Achiever Awards, the Arch Coal Foundation announced today. According to Greg Schaefer, Arch Coal, Inc., vice president of external affairs, western region, the Golden Apple awards are given to applicants in the Arch Coal Teacher Achievement Awards program who scored exceptionally high and were close to receiving the top award.

"In the 10-year history of our teacher recognition program, this year's judging was significant because there were many high scores and an unusually large number of teachers who came extremely close to

The 2010 Golden Apple recipients		
Rebecca J. Adsit	Sheridan Junior High School	Sheridan
Melanie J. Boyes	CY Junior High School	Casper
Amy Carpenter	Cody Middle School	Cody
Donna Compton	Star Valley High School	Afton
Cynthia S. Farrell	Kelly Walsh High School	Casper
Eleanor E. Grinnell	Triumph High School	Cheyenne
J. L. Josephson	Newcastle High School	Newcastle
Stephany M. Loberg	Cody High School	Cody
Chad Lybeck	Central High School	Cheyenne
Lyniece McKim	Star Valley High School	Afton
Lemuel "Chip" Miller	Cody High School	Cody
Cheryl Kay Monroe	Encampment School K-12	Encampment
Molly S. Potas	Meeteetse School	Meeteetse
Cordelia S. Roberts	Big Horn Elementary School	Big Horn
Amy K. Sorensen	Crest Hill Elementary	Casper
LeAnn E. Uhling	Saratoga Elementary	Saratoga

receiving the Achievement Award," reported Schaefer. "Wyoming is fortunate to have so many outstanding class-

room teachers." The Arch Coal Teacher Achievement Awards program is unique because the public is

asked to nominate teachers and then other teachers serve as the program's judges. "This process of public nomination and peer selection sets the Arch Coal program apart from any others," according to Schaefer. "The recipients of the Teacher Achievement Awards, as well as the Golden Apple Awards, are selected by an independent panel of peers composed of past recipients of the award."

Recently, the 10th annual awards ceremony was held at the State Capitol where the 2010 Arch Coal Teacher Achievement Award

recipients were honored. Since the awards program began in Wyoming, the Arch Coal Foundation has honored 100 exemplary classroom teachers and has provided \$270,000 in cash awards.

The Wyoming Department of Education, the Wyoming Education Association, the Wyoming library community, Taco John's and Loaf 'N Jug stores are longstanding supporters of the program. The Arch Coal Foundation also is a supporter of teacher-recognition programs in West Virginia, Utah and Colorado, as well as a number of other education-related causes.

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Peabody Energy Completes \$2 Billion Unsecured Credit Facility

--Peabody Energy (NYSE: BTU) announced today that it has completed a new five-year senior unsecured credit facility to replace its existing facility that was scheduled to mature in September 2011. The new facility includes a \$1.5 billion revolver and \$500 million term loan.

"This new credit facility reflects our financial strength and the confidence of the credit markets in Peabody," said Executive Vice President and Chief Financial Officer Michael C. Crews. "We are pleased to have a consortium of lenders from four continents that complements the company's international growth strategies."

Bank of America Securities LLC, Citigroup Global Markets, Inc. and HSBC Securities (USA) Inc. served as joint lead arrangers and joint book managers for the new credit facility. The facility was heavily oversubscribed and includes banks from the United States, Australia, Europe, China and other Asian nations.

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Peabody Energy Grants \$2 Million to Develop Clean Energy Technology Lab at The University of Wyoming

The University of Wyoming (UW) recently announced a \$2 million gift from Peabody Energy to create the Peabody Energy Clean Coal Technology Laboratory in the UW Energy Resource Center in Laramie. This gift will be doubled by the Wyoming State Legislature matching fund. Wyoming is investing significant resources in clean coal research and has committed nearly \$75 million, which has resulted in partnerships with industry leaders – such as Peabody – who prioritize developing and commercializing clean coal technologies, said UW President Tom Buchanan.

“Research in the area of clean coal technology is one of the particular emphases for our School of Energy Resources, and this gift provides laboratory space for the expanding work that UW faculty and students

are doing in this field,” said Buchanan. “This serves as an excellent example of how university research and industry application can work together with support from state government to make Wyoming a leader in clean coal technology.”

As part of the School of Energy Resources, the Peabody Energy Clean Coal Technology Laboratory will house research facilities to develop coal-fueled energy technologies, with an emphasis on the next generation of low-carbon and near-zero emissions. These include carbon dioxide capture and storage (CCS) and laboratory-scale coal gasification, which involve hydromethanation research, synthesis gas conversion, catalyst development and materials research.

“Peabody is a global leader

in clean coal solutions, advancing more than a dozen projects and partnerships to commercialize near-zero emissions

“The Peabody Energy Clean Coal Technology Laboratory will house research facilities to develop coal-fueled energy technologies”

technologies,” said Peabody Energy Chairman and Chief Executive Officer Gregory H.

Boyce. “We applaud the University of Wyoming and the state for leadership in this research.”

Carbon capture and storage compresses carbon dioxide into a fluid-like state and injects it underground to further recover oil or for deep storage into saline aquifers or other geology. Coal gasification can convert coal to natural gas, transportation fuels and chemicals. The gift brings together UW and industry experts to capitalize on Wyoming’s significant investment in developing clean energy market technologies, said UW Foundation President Ben Blalock.

“Peabody’s partnership with UW’s energy programs is another major corporate tie for Wyoming’s university,” said Blalock. “The Clean Coal Technology Laboratory will serve as an asset to our uni-

versity, our state and the energy industry.”

As an example of increasing global interest in managing carbon, the Obama administration is encouraging broad deployment of CCS technologies. This includes as many as 10 commercial-scale CCS demonstrations that could come on line as quickly as 2016.

Peabody is the top producer in Wyoming’s Powder River Basin and a global leader in clean coal solutions, advancing signature projects around the world to commercialize near-zero emission technologies, including GreenGen in China, the COAL21 Fund and Global Carbon Capture and Storage Initiative in Australia, and FutureGen in the United States. *d*

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JOY OPTIDRIVE Technology Available on Feeder-Breakers

Few innovations in mining machinery technology have been as widely adopted and enthusiastically accepted as has Joy Mining Machinery's OPTIDRIVE AC variable frequency drive. In less than two decades, OPTIDRIVE has grown from inception to being universally applied to Joy's underground mining equipment, most recently as an option on the company's STAMLER PRODUCTS of Feeder-Breakers.

"There have been variable frequency drives (VFDs) on feeder-breakers for a number of years," offered Mike Chizmar, Global Product Manager Feeder-Breakers, "but nothing to compare with the advanced integrated capabilities Joy's OPTIDRIVE brings.

"Additionally, with OPTIDRIVE our customers have a single interchangeable drive control system for JOY underground mining machines: Shuttle cars, continuous miners, flexible conveyor trains and, now, feeder-breakers," he said, noting that each piece of equipment still retains the software unique to its application.

What OPTIDRIVE does is integrate the electrical and mechanical systems and each unique piece of software. Where the motors and drive in the OPTIDRIVE system are designed for each other, Joy controls the technology to ensure a compatible system that maximizes utilization of both components, as opposed to using industrial off-the-shelf components modified for underground mining.

OPTIDRIVE equipped feeder-breakers are available for both underground and surface applications. Interest in VFD with underground feeder-breakers is on the increase and, currently, about 60% of the units going into surface applications are so equipped. All STAMLER Feeder-Breakers with electro-mechanical conveyors are capable of accepting VFDs.

Worldwide, more than 1,000 STAMLER Feeder-Breakers are currently in use making Joy the market leader for feeder-breakers in both the U.S. and globally.

The origin of OPTIDRIVE dates back to 1992 when Joy adapted AC variable frequency drives to two existing continuous miners, with redesign and retrofitting following in 1996 and 1997, the same year when Joy installed a similar VFD on a longwall shearing machine; the same basic unit in use today,

a single brand name.

"Since then," Chizmar noted, "its success has been exceptional and the reason for this unparalleled success is OPTIDRIVE's proven increased performance, reliability and availability. In addition to offering the universal benefits of interchangeable

OPTIDRIVE made it possible to increase the maximum tramming speed of the continuous miner to more than 85 feet per minute (25 metres per minute) and, in the instance of the JOY 14CM27 continuous miner, to 90 feet per minute (27 metres per minute). This means less time moving place-to-place

is the same regardless of application—to break/size material, to convey it and discharge it—its final design may not be as we take into consideration the hardness of the material to be processed and the potential detrimental effects, if any, on the conveyor related components. Other design concerns include customer preferences and associated maintenance."

According to Joy, the OPTIDRIVE system programming controls the conveyor by two means. Either the conveyor speed can be varied manually through the VFD or the breaker motor amperage readings can slow the conveyor automatically to facilitate breaking of the material being conveyed to the discharge end of the unit. Prior to OPTIDRIVE, with electro-mechanical conveyors the only way this could be accomplished would be to physically install retarding chains or to change sprockets or electric motor RPM, neither of which is really feasible unless the change is to be permanent.

OPTIDRIVE allows an operator to control 25% to 100% of the feeder-breakers rated conveyor throughput capacity, which is particularly important in handling hard materials. By slowing down the flow of material through the breaker, there is less impact and shock load on the breaker components, prolonging life and reducing maintenance. In one instance, in converting from an electro-mechanical conveyor machine to an OPTIDRIVE AC-VFD unit, an operator reported reducing the number of shear pin failures by more than 50%.

"With OPTIDRIVE," Chizmar continued, "these advantages are accomplished with less hydraulic circuits while requiring less than typical hydraulic maintenance. When you can increase efficiency, decrease wear, decrease maintenance and the time it takes to perform it, you allow the operator to spend more time in the coal. When you do that, you have made a major contribution to lowering costs per ton, improving production and productivity, and increasing profitability."

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upgraded along the way to improve and increase overall performance.

The major advantage of AC drives is that more power can be provided to drive a machine within the same space previously occupied by DC motors. Additionally, because AC motors are brushless, the time-consuming and maintenance expense of brush replacement associated with DC motors is eliminated, as is the possibility of contaminants entering the motor during replacement.

In 2001, the next generation VFD system was fitted to continuous miners and, two years later, to Joy's flexible conveyor train (FCT) continuous haulage system and shuttle cars. By 2004, Joy introduced OPTIDRIVE, the bringing together of the interchangeable hardware and the software unique to each machine under

parts and reduced inventories, reduced maintenance costs and lower costs per ton of coal mined, OPTIDRIVE also brings individual benefits to each piece of equipment, such as increased longwall shearer motor capacities and new software that provides increased current limit of the drive at slower motor speeds, improving both performance and reliability.

"With shuttle cars," he continued, "OPTIDRIVE resulted in a significant increase in power, speed and productivity, as well as in improved operator comfort that in itself promotes productivity. With continuous miners, this gave Joy the ability to design physically smaller machines for low seams without sacrificing the power and mass essential to mining the coal in the most productive and efficient way possible. Also,

and more time doing what a continuous miner is designed to do, mine coal."

The key to the effectiveness of the identical OPTIDRIVE hardware and machine-specific software is no better demonstrated than in its application to Joy's flexible conveyor train. OPTIDRIVE matches the speed of the traction and belt systems between the outby and inby ends of the machine, enabling the operator to tailor the belt speed to match the production rate of the continuous miner. This helps reduce belt wear that, together with the system's soft-start capability, results in longer belt life and lower costs per ton of coal mined.

"This is similar to what OPTIDRIVE brings to STAMLER Feeder-Breakers," Chizmar noted. "While the function of the feeder-breaker

Coal Leader Product News

Joy Shuttle Car

The role of haulage equipment is to efficiently remove the cut material from the working face in such a manner so as to enhance the performance of the continuous miner and maximize the productivity of the overall section. Joy fully understands this role and proactively works with the mining industry to provide comprehensive "system" solutions to suit individual application needs.



Since the introduction of our first shuttle car in 1938, JOY shuttle cars continue to be the mainstay of the industry for batch haulage vehicles. Their exceptional reliability, low operating cost and sustained high levels of productivity are unmatched. Through the extensive use of sophisticated computer-aided design systems, JOY shuttle cars continue to develop, evolve and improve.

Underground mines are tough places for haulage vehicles to operate – JOY shuttle cars are designed to meet the challenge. Every element of a JOY shuttle car is engineered to balance performance and efficiency. JOY shuttle cars have a heavy-duty, high-power drive train that enables them to haul loads in extremely arduous conditions. The permanent four-wheel drive system is powered by two 85kW VFD AC traction motors (50kW in lower seam models). Wheel units have been upgraded to be more robust and durable and the cast pivot axles are virtually indestructible. A four-wheel independent suspension system is also available to help maintain higher tram speeds and improve the operator's comfort in uneven and/or broken roadways.

The JOY shuttle car chassis and rolling gear are designed using Finite Element Analysis (FEA) techniques to find the optimal balance of volumetric

load, vehicle dimensions, load-carrying ability and fatigue life. Heavy-duty conveyor reducers and abrasion-resistance conveyor decking further improve reliability and durability. With over 80 units in the field today, JOY shuttle cars are available with an optional remote control system. Remote control permits deeper cuts as the shuttle car, now unmanned, can follow the miner under unsupported roof. This significantly improves the overall productivity of a room and pillar section.

Atlas Copco's Minetruck MT42 Next Generation Underground Trucks

A high speed 42-ton articulated truck, the MT42 has been designed for maximum productivity, increased safety and operator comfort.

The Minetruck MT42 is powered by a 520-hp EPA Tier 3/Stage IIIA Cummins QSX15. The fuel efficient, low-emission engine, coupled with proven drivetrain components, delivers reliable performance and high speed on ramps. The transmission has eight forward and two reverse gears and features a self-diagnostic system for rapid troubleshooting. A service bay on the side of the truck allows easy access to filters, valve blocks and service points for daily maintenance, and the cabin can be hydraulically tilted to expose the engine bay.

Operator comforts in the standard ISO ROPS/FOPS certified cabin include an air suspended forward-facing seat; a clear, multifunction display monitor; air conditioning; and a trainer's seat. The operator's sound exposure is below 80 dB (A) in the cabin. Rear facing cameras – one backup camera and one loading camera covering the box – increase the operator's view from the cabin.

The articulated steering increases maneuverability and allows agile cornering, while the dump system can discharge a full load in just 13 seconds. Front axle suspension further contributes to operator comfort, while also allowing greater speeds on mine

roadways. The truck's brakes are spring applied, hydraulic released (SAHR) – the safest in the industry. SAHR brakes eliminate the need for a separate parking brake, are low maintenance and provide extended service life.

"The Minetruck MT42 has safety and performance features that will be very attractive to our customers. The designers have done a great job of combining new technology with some of our proven design features," said Ed Tanner, Business Line manager, Atlas Copco Underground Rock Excavation.

Jennmar Offers Advanced Ground Control Engineering

Keystone Mining Services is the engineering affiliate company of Jennmar Corporation that oversees research and development. KMS conducts extensive ground control engineering for Jennmar.



KMS has made improvements to its computer modeling packages, including primary and supplemental bolting, pillar design, optimum longwall orientation and mining sequence, and seam interaction stresses.

The ultimate goal of Keystone Mining Services and Jennmar is to utilize existing and new products and advanced ground control engineering to improve mine safety and productivity.

Bucyrus VAST™ Shovel Simulator Delivers Cost Effective Operator Training!

Bucyrus International, Inc. announced the introduction of the new VAST™ System (Value Added Simulation Training) specifically for Bucyrus electric mining shovels. VAST™ is designed to reduce training costs, increase productivity, and improve training effectiveness. Studies have shown that new operators

who receive training with VAST™ prior to field training consistently maintain a higher level of productivity than those who do not receive simulator training. The VAST system has a low cost to purchase and operate; all that is needed is the VAST software, an updated Windows based PC, a monitor, and two joysticks.

VAST™ gives an introduction to the basics of safe, productive shovel operation and also serves as refresher training for more seasoned operators. Simulator users are placed at the controls of a Bucyrus shovel in a virtual mine and interact with a simulated haul truck. The VAST™ system contains a total of 8 different training modules including:

Cat® 994F Wheel Loader Now Offers Extended High Lift Option

The new Extended High Lift Option for the Cat® 994F Wheel Loader enables the popular mining machine to load Cat 793 and similarly sized trucks more efficiently. The Extended High Lift (EHL) linkage provides 42 inches (1075 mm) more dump clearance compared to the High Lift linkage.

The additional lift height makes it easier for the operator to load a 250-ton size class truck. For faster cycle times, the operator can back the 994F away from the truck without racking back the bucket. The additional lift also enables the operator to dump the last pass without pushing material. Centering the load, for reduced truck wear, better truck handling and less spillage, is easier, too.

The EHL linkage is designed to reduce operator fatigue, decrease loading time and improve daily production when loading 793 size trucks. In a 793 loading test with the new linkage, cycle time decreased 5.5 percent, which resulted in a 5 percent increase in production. The 994F equipped with EHL linkage is rated at 35 tons (32 metric tons) and is a 7-pass match with the 793.

The EHL Option consists of

new lift arms, lift and tilt cylinders, tilt links and counterweight material, which is added to the interior of the rear bumper. An extended high lift



kit for retrofitting 994F wheel loaders already in the field will be available. New 994F wheel loaders also feature structural changes to both the front and rear frames for extended durability.

Cattron Launches New Website Featuring Enhanced Navigation

Cattron Group International, a leading global manufacturer of remote control products and professional services for the industrial, mining, commercial mobile and railroad markets announces the launch of its new website:

www.catrongroup.com.

Features of Cattron's newly designed website include improved navigation through easy to use drop down menus and product page tabs, enhanced graphics, and the ability to download product information for all of Cattron's brands from one page.

With 64 years of radio frequency (RF) and industrial remote control experience, Cattron Group companies have a total installed base of over 125,000 remote control systems throughout the world. Its products are suitable for all industries including railroads, construction, shipyards, mining, aerospace, steel, military, agriculture, shipping, material handling, utility vehicles and many more.

The Cattron Group International subsidiary companies have operations in the USA, Canada, UK, South Africa, Brazil, Europe, and Asia. World Headquarters are located at 58 West Shenango St., Sharpsville, PA, 16150, USA..

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