Opening Remarks and Summary of Testimony
Paul Thompson, Chairman of the Board
FutureGen Alliance

Before the
U.S. House Committee on Science and Technology
Subcommittee on Energy and Environment
April 15, 2008

Thank you Mr. Chairman, and fellow Committee members, for scheduling a hearing on this important topic and affording me the opportunity to testify.

My name is Paul Thompson, and I am Chairman of the Board of the FutureGen Industrial Alliance. The Alliance is a global, nonprofit consortium of thirteen energy companies formed at the request of the U.S. Department of Energy (DOE) to co-fund, design, and construct the world's first, full-scale near-zero emission coal gasification generating station with hydrogen production and 90% CO_2 capture and sequestration. In addition to my Alliance responsibilities, I am Senior Vice President, Energy Services of E.ON U.S. I am responsible for generation, transmission, and wholesale energy marketing at our operating utilities: Louisville Gas and Electric and Kentucky Utilities. E.ON U.S. is wholly-owned by E.ON AG, based in Dusseldorf, Germany, and it is the world's largest investor-owned electric and gas utility company.

I have provided a copy of my written testimony to committee staff. I respectfully request that it be entered into the record.

In the balance of my opening remarks, I would like to address three topics:

1. My view, as a utility executive, on the importance of FutureGen,
2. The nature of the Alliance and the Alliance's interactions with DOE prior to their decision to restructure, and
3. The Alliance's view on DOE's restructured approach.

With respect to my first point, climate change is one of the most pressing, and most challenging, environmental concerns we face, from both a domestic and international perspective. Our government, and other governments around the world, either intend to, or are in the process of, developing policies to address the concern. Irrespective of which specific climate policy is ultimately adopted, the success of that policy and our economic future, will hinge on the availability of affordable low-carbon technology. Given that coal is used to generate over 50% of U.S. electricity and a large fraction of the world's electricity, the availability of affordable, near-zero emission coal technology, incorporating carbon capture and sequestration, is essential to our future. Clearly, both

ends of Pennsylvania Avenue recognize the pivotal role the federal government has to play in fostering the development and advancement of this technology.

Our company was attracted to FutureGen because FutureGen offers the opportunity to advance integrated gasification combined cycle technology with capture and sequestration faster and further than any other project in the world. The Department of Energy and President Bush are to be commended for originally launching it.

Importantly, the FutureGen at Mattoon project will meet or exceed all low emission goals, including 90% CO_2 capture, which DOE has reported to Congress numerous times as essential to our energy future.

Further, FutureGen at Mattoon fully integrates integrated gasification combined cycle, capture, and sequestration technology, and its component technologies are of commercial scale, thus validating commercial-scale performance.

One of the most important aspects of FutureGen at Mattoon is the very real progress it has already made, with five years of demonstrated successes:

- Contract negotiations with the DOE, which are vitally important and necessary to any government/private co-funded clean coal project, have been successfully completed. Any new project will have to go through that lengthy process all over again starting from scratch.

- Using a first-of-a-kind siting process, which can and should serve as a model for future commercial projects, a site that is ready to go has been selected on a fair and competitive basis. That site is Mattoon, Illinois. The selection of this site relied heavily on scientific expertise within the DOE laboratory system and premier scientific institutions. Selecting the site included addressing the complex issues associated with legal, liability, regulatory, and site geology. It will take years for new projects to go through this process.

- Based on extraordinary work by the States of Illinois and Texas, the Alliance, DOE, and many other institutions, a nearly 2000-page final environmental impact statement has been issued by DOE, which concludes the Mattoon site is environmentally acceptable.

- A team of nearly fifty engineers and scientists have completed an initial conceptual design and cost estimate for the project. I am prepared to address the cost of the project in response to your questions.

These are among the reasons that FutureGen at Mattoon is so important, and has made more progress in advancing the technology than any other project in the world.

As for my second topic, the nature of the Alliance and the Alliance's interactions with DOE, the Alliance is a nonprofit organization formed specifically at the request of DOE.

With this structure, the Alliance and the DOE achieve the goal of openly sharing the lessons of this project with the nation and the world. Following more than three-months of DOE review, including review of a conceptual design report and independent cost estimate prepared by the Alliance, the Department of Energy entered into a legally binding Cooperative Agreement with the Alliance in March 2007.

The Cooperative Agreement runs through 2017, with 80% of the effort concentrated in the next five years. Upon DOE's approval of the agreement, Alliance members irrevocably committed $10 million dollars to the current project phase and collectively budgeted nearly $390 million dollars of private money for future project phases.

The Alliance's responsibilities in this phase of the agreement, known as Budget Period 1, include siting, preliminary design, and preparation of a site-specific cost estimate. I am proud of the Alliance's efforts to fulfill its obligations under the agreement. I also want to commend the fine technical staff at DOE headquarters and the National Energy Technology Laboratory for their vision and cooperation. Clearly, though, some in DOE's senior leadership, counter to our expectations, backed away from the signed agreement and proposed a new direction in January 2008.

It is very difficult to fully understand the Department's rationale for its proposed change in direction, but it has created the opportunity for a productive discussion about the nation's climate change and energy technology needs.

Moving to my third topic, DOE's proposed restructuring, we are disappointed in DOE's proposal for multiple reasons. First, if implemented, it will result in the termination of the FutureGen at Mattoon project. This is an unacceptable loss and a step backwards in advancing carbon capture and sequestration technologies. Further, the restructured approach has a number of business, technical, and financial issues which must be addressed. Importantly, it is underfunded. An underfunded approach to such a massively complex problem using several small projects attached to commercial ventures did not make sense for landing men on the moon and it does not make sense for solving the climate change challenge.

DOE has cited, as part of the justification for their restructuring, MIT's *Future of Coal Report.* While recently presenting to the National Academy of Sciences, the lead author of that MIT report noted that the nation needs at least three projects and it will cost a minimum of $4 billion, and FutureGen at Mattoon should proceed as one of the projects. DOE is suggesting they can deliver three projects, each at one-third of FutureGen's cost, and, in total, at one-quarter of the MIT estimated cost. This is not a credible claim. All these projects are expensive, and we have to tackle the climate change technology challenge recognizing this, while also appreciating the enormous national technology benefits. DOE testified last week that a substantial deployment of capture and sequestration could cost the country hundreds of billions of dollars over the coming decade(s). If this is so, then investing a few billion on the front-end to advance the technology is a sound national investment. FutureGen at Mattoon should proceed and so should other complementary, adequately funded projects.

In a hearing last week, DOE also acknowledged that their new plan will result in delays. DOE stated at least two years; we believe the delay is likely 5 years or more. Further, DOE stated that they may relax the goals of the program to less than 90 percent CO_2 capture. From the Alliance perspective, recognizing the climate change legislation Congress is considering, this delay and relaxed technical goals do not make sense.

This should not be an either/or proposition, but a both/and solution. In DOE's testimony of last week, it was suggested that two projects would be better than one, and three would be better than two. Yet as it stands now, we have no project, and using that same logic, one is certainly better than none, and FutureGen at Mattoon is already part of the way toward becoming that one, and it would be a huge mistake to move backward on the progress we have already made.

In closing, we remain open and willing to work with the Congress and the Department of Energy to put FutureGen at Mattoon back on the fast track.

That concludes my opening remarks and I welcome the committee's questions.

Testimony
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Committee Request:

"….provide a description of the interactions between the Alliance and the Department of Energy prior to the Department's decision to restructure the [FutureGen] program. Please provide your assessment of the potential impacts of DOE's decision on the Alliance, on the future of the program as originally envisioned, and on the overall federal effort to develop and deploy carbon capture and sequestration technologies. Also discuss the restructured program and the potential role for the Alliance in the restructured program."

Testimony:

The FutureGen program is a global public-private partnership formed to design, build, and operate the world's first near-zero emission coal-fueled power plant with 90 percent capture and storage of carbon dioxide (CO_2). It will determine the technical and economic feasibility of generating electricity from coal with near-zero emission technology. FutureGen has five years of progress behind it. More than fifty-million dollars have been obligated to the effort with the majority spent. It is positioned to advance integrated gasification combined cycle (IGCC) and carbon capture and storage (CCS) technology faster and further than any other program in the world. The location of the plant will be Mattoon, Illinois. The nonprofit structure of the FutureGen Alliance, and involvement of thirteen companies that operate on six continents, is consistent with its mission to facilitate rapid deployment of near-zero emission technology not only in the United States, but throughout the world.

Climate change is one of the most pressing, and most challenging, environmental concerns we face, from both a domestic and international perspective. Our government, and other governments around the world, either intend to, or are in the process of, developing policies to address the concern. Irrespective of which specific climate policy is ultimately adopted by the U.S., the success of that policy and our economic future will hinge on the availability of affordable low-carbon technology. Nuclear, renewables, biomass, and efficiency will all be part of the low-carbon technology solution. However, coal is used to generate over 50 percent of the electricity in the U.S., and is projected to remain the backbone of the U.S. electricity system for most of this century. Given that

the growing economies of China and India will be fueled with coal plants, the availability of affordable, near-zero emission coal technology, incorporating carbon capture and sequestration, is essential to our future energy security.

The federal government has a pivotal role to play in fostering the development, demonstration, and deployment of near-zero emission coal technology. It is important that, as a nation, we invest at the scale required to develop, prove, and deploy CCS technologies to the marketplace. While estimates vary, the required investment is certainly in excess of $10 billion over the coming decade. This investment in our nation's future must be supported by the development and demonstration of near-zero emission coal technologies and CCS in a variety of applications.

The U.S. Department of Energy (DOE) is to be commended for its vocal support of near-zero emission coal technology, including CCS. Its support of this technology was recognized in backing the FutureGen program as originally envisioned, but a recent proposal to restructure FutureGen fails to recognize the scale of the challenge that this nation, and indeed the world, is facing. DOE's proposal to restructure the FutureGen program will delay technology development and integrated demonstration of commercial scale CCS by five years or more. It backs away from a nonprofit partnership that was created, at the request of DOE, to act in the public benefit and broadly share its technical results throughout the world. It rebuffs the participation of international companies (and countries) that are critical to the ultimate deployment of clean coal technology around the world. It undermines the reliability of the U.S. Department of Energy – and the United States – as a dependable partner.

Therefore, regardless of what other projects or what type of restructuring DOE proposes, it is essential that the Department reaffirms the Unites States' position as a global leader in near-zero emission coal technology and CCS development by maintaining its historical position that FutureGen at Mattoon is the flagship program for advancing CCS technologies.

<u>FutureGen at Mattoon</u>

FutureGen, located in Mattoon, Illinois, is in the national interest and is advancing IGCC technology with CCS faster and further than any other project in the world. Some key features of this program include:

- <u>FutureGen at Mattoon offers DOE an opportunity to beat its proposed timeline</u>. DOE's January 15, 2008 Request for Information (RFI) suggests an on-line date of 2015 for projects using its restructured plan. The FutureGen Alliance has already delivered five years of progress, including contract negotiations, an enthusiastic and committed local community, a site that is technically and legally ready to go, a design and cost estimate, a final environmental impact statement, vendor relationships, and a team of fifty engineers and scientists. No fully integrated, near-zero emission power plant project in the world can compete with

FutureGen in terms of its ability to move forward with urgency on the required technology development and demonstration.

- FutureGen at Mattoon will meet or exceed all DOE emissions and CO_2 capture goals. All emissions and CO_2 capture criteria included in the 2004 FutureGen Report to Congress and DOE's current Request for Information (RFI) will be met by FutureGen at Mattoon, ***including 90 percent CO_2 capture.*** It is imperative that DOE maintain the requirement of 90 percent CO_2 capture from the entire facility for the FutureGen program.

- FutureGen at Mattoon is fully integrated and at commercial scale. FutureGen at Mattoon incorporates a commercial-scale gasifier and commercial-scale "Frame 7" turbine. As configured, and with the commitment to share lessons learned widely, it gives industry a chance to learn about the cost, performance, and operating strategies for an integrated system with CCS.

- FutureGen at Mattoon is a hallmark for public benefit and information sharing. As a nonprofit enterprise, the FutureGen Alliance will broadly share information from the project, facilitating the deployment of commercial, near-zero emission power plants throughout the world. It is appropriate for DOE to provide cost sharing for additional commercial CCS projects to facilitate deployment of CCS technology, but it must recognize that commercial projects by their very nature will feature protection of technological know-how and intellectual property within individual companies rather than sharing it for broad benefit.

- FutureGen at Mattoon is a model that provides international involvement at an unprecedented level, which is essential to the rapid deployment of CCS technologies. Thirteen companies with operations on six continents are participating as members of the Alliance. Climate technologies must be globally accepted and globally deployed, or they will not be effective. International participation has been exceptionally well-managed and has been a cornerstone of the information sharing in the program. No other project or program can replicate FutureGen at Mattoon's level of international involvement. We need to remember that we are all striving to address "global climate change" not simply "U.S. climate change". What better framework than a global public-private partnership to develop and establish the acceptable to approaches measure, monitor and verify that CO_2 has been successfully captured and permanently stored.

- FutureGen at Mattoon provides a platform for testing advanced technologies, which accelerates technology development and saves the taxpayers money. A power plant constructed and operated by any for-profit entity must by its nature operate as much as possible. There is no incentive to periodically shut down to cooperate with the DOE and technology providers to install and test new technologies so as to keep driving down the costs of zero-emission technology. Maximizing the investment is a duty to both ratepayers and shareholders.

Once built, and power generation, carbon capture, and sequestration operations are underway, FutureGen at Mattoon can serve as a test bed for advanced technologies emerging from DOE's Fossil Energy R&D program and industry R&D efforts. Such testing will ***not*** interfere with the primary mission of the facility to prove integrated CCS technology at a 90 percent capture level and sequester a minimum of one million tons per year of CO_2, and to develop and prove cost-effective approaches to advancing CCS technology. Alternative testing approaches will be far more expensive. Areas where DOE expects advancements to occur include oxygen production, gasifier improvements, gas clean-up, H_2 and CO_2 separation, H_2 turbine advancements and fuel cells. By proposing to end its support of FutureGen at Mattoon, DOE will be increasing the cost and difficulty of testing the very advanced technologies that its program managers seek to develop and deploy.

- <u>FutureGen at Mattoon's costs are manageable</u>. All major global energy infrastructure projects, including other DOE projects, are being impacted by rapidly rising commodity and equipment and staffing costs. FutureGen at Mattoon is no exception. The FutureGen Alliance includes members who operate and build capital projects around the globe. They all confirmed the increase in costs on the project between 2004 and the present is typical of other capital projects. We cannot delay working on this technology.

  The Alliance has every motivation to control costs. The FutureGen Alliance is not simply a contractor billing DOE to perform a service. The Alliance is sharing in the costs pro-rata and is motivated to see technology developed at the lowest possible cost. FutureGen at Mattoon's unique financing structure mitigates taxpayer exposure. The Alliance has pledged approximately $400 million dollars to the program, will return all of the estimated $300 million in plant revenues back to the program, and will direct all of the post-program electricity revenues to public benefit R&D. Industry financial contributors will never receive a single dollar of financial return. This represents an unprecedented level of commitment. Further, the Alliance members are providing their expertise in developing and managing large power plant projects with the discipline that comes from their expertise in developing large power projects. The Alliance is willing to make this commitment because this investment is squarely in the interest of both the nation and the world.

<u>DOE Interactions</u>

The FutureGen program was initially launched in February 2003 by President Bush. At this time, industry was challenged to organize a consortium of companies to participate in the project. A consortium was judged to be a better approach than DOE's historical approach of co-funding single company projects, as there was a clear objective to have broad industry engagement. DOE representatives clearly conveyed that the business arrangement would be patterned after previous clean coal technology (CCT) cooperative

agreements. Also, because of the project scale and the desire to make the effort a global one to accelerate the technology use, it was indicated that the more restrictive CCT requirements would be removed. Specifically, the DOE represented the following anticipated terms:

- 20 percent non-federal cost-sharing;
- no repayment requirement from the industry partner;
- ability to vest ownership of the plant with the industry partner;
- traditional CCT program data protections for the industry partner;
- potential for program income (electricity, CO_2, and byproduct sales) to be shared among project participants proportional to their cost sharing during the four-year project operating program;
- all of the post-project revenues to the industry partner, including any proceeds from a sale of the facility after the project; and
- an advance appropriation of $300 million toward the project through a programmatic transfer of funds from several cancelled CCT projects. (Typically, DOE appropriates all of the funds on a CCT project in advance. However, in FutureGen's case, DOE determined full advanced appropriation was not possible).

It was with this framework in mind that industry formed the Alliance, made representations to Congress and around the world, and grew its membership. Further, in the interest of ensuring that neither the DOE nor industry were inappropriately considered to be engaging in "corporate welfare", the Alliance was formed as a nonprofit 501(c)(3) entity. The decision to incorporate as a 501(c)(3) entity is unprecedented for a DOE clean coal project cooperative agreement, and has the following implications for the Alliance members and DOE:

- unlike DOE, the industry contributors can never share in a single dollar of program income or proceeds from the plant sale if that ever occurs;
- any program income or proceeds from the plant sale realized by the Alliance must be reinvested in public benefit R&D; and
- unlike DOE, the industry contributors do not gain any stake in intellectual property rights.

At the time of the project launch the DOE leadership team included:

- Secretary Spencer Abraham,
- Deputy Secretary Kyle McSlarrow,
- Under Secretary Robert Card, and
- Assistant Secretary for Fossil Energy Michael Smith.

The public-private partnership was cemented through an initial Limited Scope Cooperative Agreement signed in 2005. This limited scope agreement supported preparation of a conceptual design report and initiating the site selection process.

By the time of the signing of the initial Limited Scope Cooperative Agreement, Secretary Abraham, Kyle McSlarrow, Robert Card, and Michael Smith had left the Department and were replaced by:

- Secretary Samuel Bodman,
- Deputy Secretary Clay Sell,
- Under Secretary David Garman, and
- Acting Assistant Secretary for Fossil Energy Mark Maddox.

For the Cooperative Agreement, the National Energy Technology Laboratory (NETL) under the Office of Fossil Energy serves as the official contracting entity for DOE on FutureGen. The Alliance is accountable to NETL on all technical and contractual issues. The official contracting officer is the individual with the authority to modify the Alliance's work scope, adjust budgets, or make binding determinations on which activities under the Cooperative Agreement can and cannot proceed. The working relationship with the staff at NETL has been very positive. From our vantage point, it appears that DOE concerns about the project have been raised by its political leadership. It is has also been the case that the DOE political leadership has often provided advice, which was valuable and consistent with contractual obligations, and has been followed.

During the conduct of the Limited Scope Cooperative Agreement, Mark Maddox left the Department and was replaced by:

- Assistant Secretary for Fossil Energy Jeffrey Jarrett.

Following completion of the activities covered by the Limited Scope Cooperative Agreement, in December 2006, the Alliance submitted a conceptual design report and cost estimate to DOE. This material served as basis for negotiating a $1.8 billion Full Scope Cooperative Agreement. Among the provisions in this agreement were:

- Alliance will continue to provide 26 percent industry cost-share (up from the original 20 percent).
- The Alliance and DOE agreed to negotiate an adjustable cap on the DOE contribution, where the level of the cap would be adjusted up or down based on inflation/escalation indices (a common practice in industry). This adjustment would be negotiated after the current project phase.
- The Alliance and DOE agreed to share revenues pro-rata instead of the typical cooperative agreement whereby the private partner keeps all of the revenues. The effect of this was to have 74 percent of the estimated $300 million in revenues be allocated to reduce DOE's cost share.
- The Alliance and DOE agreed to share proceeds from the sale of the facility on a pro-rata basis instead of all being allocated to the industry partner as is typical for industry/DOE co-funded projects. This has the net effect of creating the potential for a material repayment of DOE's cost share. To the best of our knowledge, this is unprecedented in the history of CCT or Clean Coal Power Initiative (CCPI) projects.

- Contributing Alliance members under the 501(c)(3) structure would not receive any repayment of their contributions from project revenues or a facility sale. Such funds must be directed back to research and development.

The Full Scope Cooperative Agreement acknowledged the higher project costs similar to those of every other major energy infrastructure project. In its original estimates DOE had expressed costs as constant Fiscal Year 2004 dollars versus out year dollars. Both the Alliance and members of DOE's leadership team were advised of and were well aware of their increased contributions resulting from global escalation. The project did not change in scope from its inception. DOE agreed to proceed and a Full Scope Cooperative Agreement was signed in March 2007, with a gross cost of $1.8 billion, and a net cost of $1.5 billion.

The Full Scope Cooperative Agreement runs through 2017, with most of the expenditures concentrated in the next five years. Upon DOE's approval of the agreement, Alliance members irrevocably committed $10 million dollars to the current project phase and collectively budgeted nearly $390 million dollars of private money for future project phases. The Alliance's responsibilities in the first phase (termed Budget Period 1) of the Cooperative Agreement include selection of the final site, additional design, preparation of a site-specific cost estimate, and procurement of long-lead items.

Throughout 2007, the Alliance and the four finalist sites continued to spend millions of dollars to advance the activities. The DOE continued their efforts to bring in government partners including China, India, Japan, South Korea and Australia. Project costs were a part of the negotiation with these countries. A few have already committed funding to the project. The Alliance hired staff, leased office space and retained key global contractors.

At some point after the Full Scope Cooperative Agreement was signed in March 2007, something in the Department had clearly changed or confusion had evidently developed, as Deputy Secretary Sell raised very surprising concerns about out-of-control costs, scope growth, that DOE was liable for 100 percent of the cost growth, and that the Alliance was "mismanaging the project." The Alliance did not agree with these observations and the Alliance promptly suggested a meeting to discuss the new concerns. A presentation from that meeting is included in this testimony as an attachment. In August of 2007, DOE representatives attended an Alliance Board of Directors meeting where they acknowledged to the Alliance Board that the cost growth was now understood to be due to market escalation, recognized that the project was managed by the Alliance effectively, that the Alliance has been responsive to the DOE, and that cost increases were not due to scope growth.

To this day, it is unclear why after a multi-month review process and negotiation for the Full Scope Cooperative Agreement, concerns could have arisen within DOE as early as one month after the signing of a $1.8 billion agreement.

It should be pointed out that both the Alliance and DOE were concerned about marketplace escalation. It was the Alliance's view that the appropriate way to address the issue was to follow the plan in the Cooperative Agreement and complete the current project phase, which included a site-specific engineering cost estimate. At that time all parties could discuss how DOE's financial exposure could be mitigated further. In the Alliance's view it was premature to renegotiate the original agreement when neither party had better engineering cost information or better information about escalation than when the original negotiations and agreement occurred.

Further, to maintain a large capital project on-track, it is important to establish and follow a well designed plan with predefined project phases. Had DOE and the Alliance followed the plan as agreed to in March 2007, we would be sitting here today with a final site, Mattoon, a site-specific construction design, and a site-specific cost estimate. There would have been sufficient time during this administration to adjust the Cooperative Agreement based on this new information. Instead, the effort is nearly stalled and valuable time is being lost.

During the late-Spring/Summer of 2007, David Garman and Jeffrey Jarrett left the Department and were replaced by:

- Under Secretary Clarence "Bud" Albright, and
- Acting Assistant Secretary for Fossil Energy Thomas Shope.

In late-September 2007, newly appointed Under Secretary Albright communicated, as general concepts, a set of Cooperative Agreement modifications. This introduced a new series of requests. Most were related to shifting more risk and cost from DOE to the Alliance. Early conversations were cordial and productive. From a business and capital project management perspective it did not make sense to the Alliance to modify the agreement in mid-stream without further project data such as site and cost estimate details; however, there was a recognition and willingness of the Alliance to modify the agreement at the appropriate time. Further, there was Alliance willingness, in principle, to accept DOE's request that after the DOE had expended a mutually agreeable sum, any future cost increases above that sum would be shared 50/50 versus the previously agreed to 26/74. During meetings with DOE, the general concepts were developed in an initial term sheet of modifications for further discussion.

Thomas Shope left the Department during this time period. The Assistant Secretary position remains vacant with no one acting to this day.

In mid-October 2007, a stumbling block was reached when DOE raised for the first time an absolute demand to limit the Alliance's ability to use commercial financing for a portion of the project. Commercial financing is routinely used on DOE clean coal projects and is expressly contemplated in the applicable regulations. Financing is an important tool to manage project cash flow and manage unforeseen risks. Normal private sector energy projects are typically financed 50-80 percent of total project cost. In the case of FutureGen, a lesser amount of 10-20 percent is manageable. Financing had been discussed with DOE as early as 2003 and the Alliance had an obligation to provide a

financing plan to DOE prior to the start of the next project phase. Thus, for financing to be eliminated or highly restricted by DOE came as another surprise.

Still, the Alliance, based principally on a series of strong positive signals to come from DOE and the administration, operated under the view that the DOE concerns could ultimately be resolved no later than the start of the next project phase and that selection of a final site and preparation of a site-specific cost estimate would help in the resolution of those concerns. The Alliance made it very clear that its members would agree to contribute their pro-rata financial commitments of ~$400 million in cash, subject to the availability of matching DOE cost-share. Thus, there should be no concern over the Alliance walking away after construction began. Moreover, the Alliance would have already spent tens of millions of private sector money before construction so there would be the added incentive to see the project to completion.

In parallel to these discussions with DOE, and DOE's position that financing should be highly restricted, the following very positive events occurred over the Fall of 2007 leading up the final site announcement:

- Secretary of State Condoleezza Rice made positive mention of FutureGen in a speech before the United Nations
- President Bush made positive mention of FutureGen in a meeting of Major Economies on Energy Security and Climate Change.
- DOE issued an approximately 2000-page Final Environmental Impact Statement (EIS) and published a Notice of Availability in the Federal Register on November 16th. The EIS described the relationship between DOE and the Alliance, the project costs and cost-share, and DOE's preferred alternative to provide financial assistance to the FutureGen Project.
- DOE issued a press release indicating that completion of the EIS would enable a site announcement by year-end.
- DOE was communicating to Congress that a site would be chosen by year-end.
- The EIS Notice in the Federal Register started an important clock on a 30-day "wait period" before the end of which DOE could not issue a final Record of Decision (ROD). The Alliance and DOE had discussed, multiple times, in the preceeding six months, that DOE would issue the ROD when the 30-day wait period expired (December 16 was the expiration date) and the Alliance would announce the site no later than December. DOE provided an advance copy of the final draft ROD for Alliance review. This interaction included a discussion that DOE was on-track in its preparation of the ROD so that it could be issued on December 17, albeit an aggressive schedule. DOE staff were working hard, and it was an excellent team effort.

On the basis of these positive actions by DOE and the administration, the Alliance made the final site decision on December 6, 2007. The Alliance was obligated to make this site selection under the terms of the still active Full Scope Cooperative Agreement. Given the involvement of thirteen companies, communication planners, project staff, and others, within a week approximately fifty individuals knew the site was Mattoon. While still

confidential, the Alliance recognized the wheels were now in motion and the site would be known either through an organized message or through an unintended leak. Obviously an organized, versus unintended, release was the preferred approach.

On December 10th, DOE's Deputy Assistant Secretary for Oil and Natural Gas Programs, who was also Acting Principal Deputy Assistant Secretary for Fossil Energy, called the Alliance CEO to indicate a letter would be coming to the Alliance. A letter followed, from Mr. Slutz, indicating a delay in DOE's issuance of the ROD and indicating it was "inadvisable" for the Alliance to schedule an announcement of the selected site while offering compelling reason for a delay. At that time, (with all due respect to Mr. Slutz and his position), the Alliance cannot not recall having heard from him before, nor was he known to be a central player in the Department's project decision making process. Consequently, the Alliance weighed very strongly whether or not to take DOE's advice against other compelling factors for proceeding.

Given that the wheels on the site announcement were already in motion, the site decision was already made and becoming more difficult to keep confidential with so many individuals knowing the final site, and project delays costing as much as $10 million per month, the Alliance felt the reasons for proceeding outweighed the reasons for delay. The Alliance had already reviewed an advance copy of the ROD, which reaffirmed the EIS findings and concluded all four candidate sites were acceptable. It was assumed the ROD would indeed be released on time or soon thereafter without issue, as it was effectively complete. There was also a strong feeling that it was inappropriate for the Alliance to string along the states of Texas and Illinois with another delay. The states had been spending substantial amounts of their sparse state resources and had originally been promised a site announcement in September, then October, and then November driven by slippage is the EIS release. The efforts of both states were commendable and they earned our admiration for always having been prompt when it came to meeting their deadlines to the Alliance.

While DOE had suggested a possible restructuring to several of the Alliance member companies, this information was only heard by the Alliance management second and third hand with sketchy details. It was not uncommon to hear rumors or misinformation second and third hand that never materialized as correct. No official representative of the Alliance was specifically told of the restructuring plans by DOE prior to the day of the DOE announcement.

<u>DOE's Proposed Restructuring</u>

As currently configured, DOE's proposed restructuring would effectively result in the termination of FutureGen at Mattoon. The Alliance Board carefully evaluated the proposed restructuring and has concluded that neither a thirteen-member consortium nor a smaller Alliance consortium could successfully conduct FutureGen at Mattoon under the newly proposed model. The reasons for this are technical, financial, and business structure related. The Alliance also has serious concerns about the adequacy of funding under the proposed restructuring, and whether *any* project conducted by *any* party could

meet the stated DOE goals in a timely manner. The Alliance view remains that it is in the national interest to *complement* FutureGen at Mattoon with additional, adequately funded projects in a variety of engineered applications and a variety of geologic formations, but that complementary projects must not come at the expense or delay of the number one priority, FutureGen at Mattoon.

Currently, DOE's proposed restructuring leaves many unanswered issues that are of concern. Some of the specific concerns about the DOE proposed restructuring include:

- DOE's schedule under the restructuring proposal is unrealistic. DOE has an important obligation to the taxpayer to follow comprehensive contracting processes, conduct technology reviews, and prepare an environmental impact statement on any new project. The schedule (i.e., a proposed on-line date of 2015) in the Request For Information (RFI) is not realistic for a project that meets 100 percent of the stated goals. Many potential industrial partners are unfamiliar with DOE's required practices, and it is important that the DOE inform them of a reasonable schedule so that they can properly conduct the project and deal with their third-party investors. Overly optimistic schedules are a disservice to Congress, industry, and the public.

  Based on our experience, I would envision the following as a fast-track schedule for DOE to identify an alternative, fully integrated project that meets all of the existing performance goals for the FutureGen program:

  - 2009+: project selection and cooperative agreement negotiation
  - 2012: completion of preliminary design, environmental impact assessment and record of decision
  - 2013: completion of detailed design and procurement of major technology components
  - 2017: completion of construction
  - 2018: initial operation
  - 2022: completion of test period

- DOE's restructured approach has problematic business parameters. DOE's proposal implies that 90 percent capture simply involves the addition of new technology to an existing IGCC. It does not. The complex integration of CCS into a commercial IGCC plant will entail significant modifications to many other systems, including commercial systems inside the base plant. It would also largely require a restart of design work done to date on the base commercial plant. Thus, the government, its procurement rules, and its oversight practices could easily extend into the commercial, for-profit power plant. Further, applying FutureGen funds to a project with anything appreciably less than capturing 90 percent of the ***total*** CO_2 emissions from the ***entire*** plant would fall short of what is needed to rapidly develop near-zero emission coal plants.

- DOE's restructured approach does not address the increased marginal cost of electricity due to adding CCS to a plant. The modified plant that DOE proposes that industry build *will cost substantially more to operate* than a traditional plant. DOE's RFI is largely silent on operating costs. Adding CCS to an IGCC plant is expected to increase the cost of electricity by as much as 50 percent and the marginal production cost by as much as 20 percent. Because power plants dispatch electricity to the grid based on their marginal operating cost, the approach DOE proposes could result in a plant that is too expensive for industry to operate.

- DOE appropriately retained the 90 percent capture goal in its RFI and must do so in any awarded projects. However, DOE has recently made public statements that this goal may be relaxed. The FutureGen program has identified 90 percent CO_2 capture as an important requirement to advance CCS technology. This level of CO_2 capture has significant impact on the design of many critical components of the facility, such as the combustion turbine, gas clean-up system, and syngas clean-up system. It would be a serious mistake if this target level is relaxed. Ninety percent is a technical goal designed to ensure a sustainable future for coal in a carbon-constrained world. Today's commercial projects cannot technically or economically achieve this goal and DOE's program should focus on bold technological advances, not incremental change.

- Plant revenue must go to the industrial partner. In a commercial project, it is expected that all of revenue would need to go to the industry partner. Unlike FutureGen at Mattoon, in which DOE shared in the project revenues substantially offsetting federal investment, for projects conducted under DOE's new approach, a successful commercial project would insist that plant revenues go to the industrial partner so that private sector participants can generate a commercial return.

In its 2004 report "FutureGen Integrated Hydrogen and Electric Power Production and Carbon Sequestration Research Initiative," DOE acknowledged the necessity for the type and level of risk sharing associated with FutureGen at Mattoon if technology is to advance at the required pace. In its report, DOE said:

> "FutureGen's integration of concepts and components is key to providing technical and operational viability to the generally conservative, risk-adverse coal and utility industries. Integration issues such as the dynamics between upstream and downstream subsystems (e.g., between interdependent subsystems such as the coal conversion and power and hydrogen production systems and carbon separation and sequestration systems) can only be addressed by a large-scale integrated facility operation. Unless the production of hydrogen and electricity from coal integrated with sequestrating carbon dioxide can be shown to be feasible and cost competitive, the coal industry will not make the investments necessary to fully realize the potential energy security and economic benefits of this plentiful domestic energy resource."

Technology advancements and market changes in the last five years have not changed this need for a full scale validation envisioned in DOE's report and FutureGen at Mattoon.

There is no program in the world that can move near-zero emission power and CCS faster or further than FutureGen at Mattoon. The FutureGen Alliance is nonprofit, includes unprecedented international involvement and information sharing, and has a site that is technically and legally ready to go. Alternatives will cost the country five years or more of delay and/or deliver less in terms of results.

As Congress and the administration debate the appropriate structure for the FutureGen program, the Alliance urges that all of these factors be taken into account. FutureGen at Mattoon should be maintained as a global flagship program that is the nation's top priority for advancing near-zero emission coal technology, and complementary projects should be added to the program as the budget allows.

FutureGen™ ALLIANCE

Clean Energy for a Secure Future

FutureGen

Project Status

Greg Walker, Alliance Chairman (SVP Foundation Coal)
Chris Hobson, Alliance Vice-Chairman (SVP Southern Company)
Paul Thompson, Alliance Director (SVP E.ON – U.S.)
Steve Winberg Alliance Director (General Mgr CONSOL Energy)
Mike Mudd, Alliance CEO

18 April 2007

Meeting Objectives

- Answer Any DOE Questions
- Alliance Perspective on the Importance of FutureGen
  - *Right Project at the Right Time*
- Alliance Formation, Make-up and Operations
  - *Right Structure and Leadership*
- Basis upon which Industry Committed
  - *Right Deal*
- Address Project Cost Inflation/Escalation
  - *Right Schedule and Cost Control*
  - *Cost Estimate*
  - *Realities of Inflation*
- Chart Path Forward

FutureGen
Right Project at the Right Time

- Alliance formed in direct response to President's Initiative
  - Industry is contributing nearly $400M with no expectation of financial return
- Alliance members agree FutureGen is central to a technology-based approach to climate change
  - DOE's CCTP and the IPCC suggest advanced technology can reduce the cost of addressing climate change by trillions of dollars
  - FutureGen is central to realizing these benefits
  - Members willing to support pursuit of greater R&D Budget for all DOE
- FutureGen is unique
  - No other fully integrated power plant combining gasification, carbon capture, and sequestration in a deep saline geologic formation
  - FutureGen provides a clear mechanism to assess the cost, performance, and public acceptance of integrated near-zero emissions power plant, which is an essential precursor to commercial deployment

FutureGen
Right Project at the Right Time

- Factors influencing current and prospective future members – why FutureGen is important to members
  - High-level Administration support
  - Aggressive, but realistic, timetable
  - Leading global project to validate models for measuring, monitoring and verifying sequestration results
  - Leading global project in terms of engineering
  - Outside expert/academic input and DOE oversight adds to global credibility
  - Foreign participation, which is crucial to global technology acceptance
  - Operated with commercial business discipline
  - Will provide clarity to commercialization uncertainties: permitting, insuring, bonding, operation, monitoring, complex surface and subsurface rights, etc…
  - Addresses critical R&D needs to move toward DOE's 10% goal – oxygen separation, multiple coal gasifier, H2 production, gas clean-up advancements, hydrogen turbine advancements
  - Creates a self-sustaining R&D facility

FutureGen
Right Project at the Right Time

- Unprecedented global visibility
  - FutureGen is in the press nearly every single day
  - Foreign governments and companies see FutureGen as one of the most, if not the most, important sequestration projects on the planet
  - FutureGen is a catalyst for new projects in other countries, which is exactly what is needed to build global acceptance of the technology and position the U.S. as a leader on climate change solutions

- FutureGen is on an aggressive timeline that is aligned with U.S. and global needs
  - Pressure to address climate change and the long-lead times for equipment procurement and construction demand an aggressive schedule

FutureGen

Right Structure and Leadership

- Industry
  - Established Alliance as 501(3)c non-profit entity
  - Twelve leading companies with operations on six continents
  - Investing nearly $400M* in the project plus recycling 100 percent of electricity revenue back into the project to offset both DOE and Alliance costs
  - Individual companies forgo right to IP, revenues, or assets
  - IP will go to the vendor community and public, as appropriate to facilitate commercialization
  - Alliance brings industrial business discipline, and power plant expertise to the project

>40 percent of U.S. coal production

>20 percent of U.S. coal-fueled electricity production

*$379M in actual dollars through 2017

FutureGen

Right Structure and Leadership

- Alliance views DOE's role as essential
- It's clear FE is committed and has dedicated their "A-team" to the project
- DOE-FE
  - Providing appropriate oversight
  - Ensuring alignment with national technology goals
  - Providing, through in-house and sponsored research, the technical foundations for FutureGen
  - Managing international government participation in FutureGen
  - Conducting NEPA process

FutureGen
Right Deal

- Alliance came to the table with the following understanding:
  - DOE wanted a consortium of companies not a single company
  - 74% government cost-share (Reference: DOE, OMB, CEQ Alliance meeting 2004)
  - Administration to maintain support of FutureGen and other coal programs (Reference: Bolten's letter and FY05 request levels)
  - $950M cost was in FY04 dollars and subject to adjustment for inflation (Reference: Secretary Abraham's Q&As on FY04 budget request)
  - Alliance and DOE to share in adjustments for inflation
  - Industry contributors to the Alliance would get zero financial return and no IP rights (unlike CCPI demonstration projects)

- Alliance built a global enterprise based on this understanding

Right Schedule and Cost Control

- The Alliance has met every major milestone since signing the initial cooperative agreement with DOE
- Alliance is using the same project management techniques that have successfully delivered countless industrial projects, on-schedule and in-budget
- Incentive for Alliance to control costs—we share in growth
- There has been zero cost growth due to scope growth relative to DOE Report to Congress
  - same plant size
  - same CO_2 capture target
  - same SOx, NOx, and Hg targets
  - same commitment to global involvement
  - same plant on-line year

Right Schedule and Cost Control

- FY08 Administration request of $108M was on-target
  - Funds cover continued engineering design and long-lead time procurements
- Scheduling long-lead time procurements
  - Construction begins in the Spring of 2009 with all major equipment deliveries completed no later 2011.
  - Current lead times on selected major equipment components are 24 to 36 months between the time of the order and the time of delivery.
  - Thus, expenditures for long-lead time equipment orders are substantial in FY08 and FY09
- FY09 to FY11 are peak Federal funding years at $233M/yr.
  - Available foreign contributions would reduce this amount

Right Schedule and Cost Control

- The current estimated net cost of the project in nominal, as-spent dollars is $1.484B between FY04 and FY17.
  - $1.484B is the net project cost including both operating costs and revenues
  - Assumed 5.2% inflation per year through 2017
- The Alliance will fund $379M of the total estimated cost.
- The Federal government, consistent with the terms of the deal, would be responsible for $1.105B.
  - ~$ 80M of this is expected from foreign governments
  - $ 99M has been appropriated between FY04 and FY07
  - ~$926M in future appropriations is required
  - ~$233M is the estimated peak annual Federal funding requirement

FutureGen
Cost Estimate Summary

	DOE 2004 Estimate	Alliance 2006 Independent Estimate
Project Cost (1Q 2004$)	$950M	$954M
Scope Growth (1Q 2004$)	--	**Zero**
Inflation Multiplier (converts 2006 cost to actual outlays, in future-year dollars, 2005 - 2017)	--	1.56
Net Project Cost (future-year dollars thru 2017)		$1,484M*
DOE/FG Cost Share %	**74/26**	**74/26**
DOE/FG Cost Share $M	**$700/$250**	**$1,105*/$379***

- Alliance Estimate Confirms DOE Estimate
- Project remains focused on original scope and mission as established by DOE
- Based on public Government and Industry Indexes
- Equivalent to DOE's original estimate. Inflation does not exceed inflation for other industry projects. No scope growth.

*DOE's NEPA costs are 100% DOE funded.

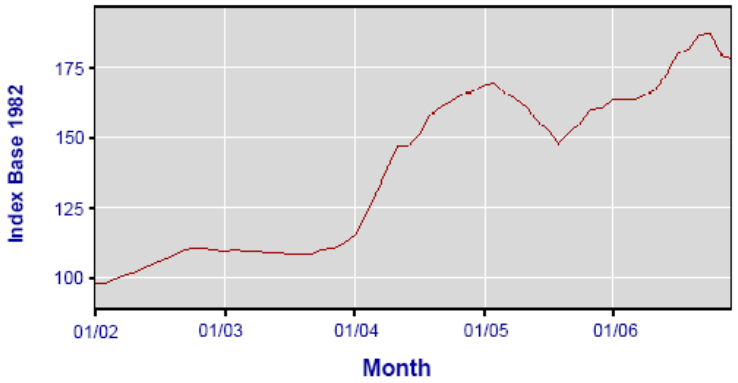
Inflation

- Inflation reflects the normal up-and-down fluctuations in materials, labor, and services over time.
- Controlled by market forces (supply/demand), not the Alliance, DOE, nor the Congress
- Similar inflation in similar projects seen by all Alliance members globally
- The Bureau of Labor and Standards, as well as other organizations track inflation and report it publicly

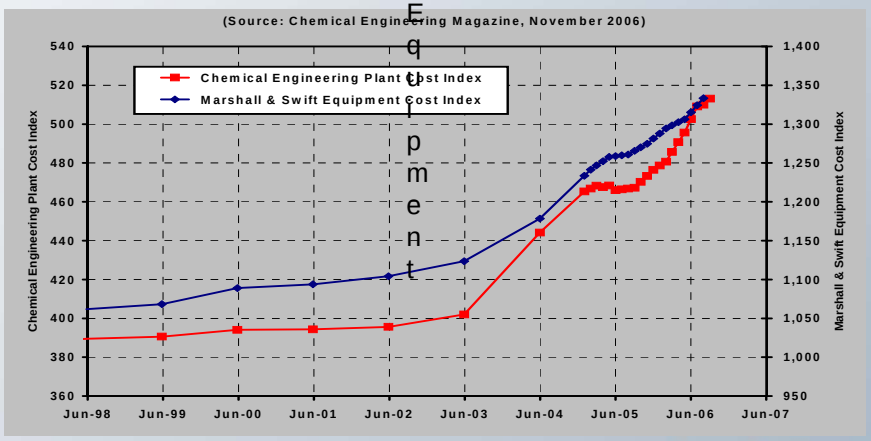
FutureGen
Inflation

- Since DOE completed its original cost estimate in 1Q FY04, the Bureau of Labor and standards reports:
  - well drilling up ~150%**
  - heavy construction up ~30%
  - general A/E services more closely tracked general inflation

Carbon Steel Price Indices



Equipment Cost and Process Plant Costs



**When originally presented to DOE, there was a typo in the number. It was listed at 250 and has been corrected to 150 in this copy.

FutureGen

Right Industry Commitment

- Industry has responded to and remains committed to the President's initiative under the terms of the deal
- Industry is delivering with distinction
- Industry and DOE share the burden of making the project successful in spite of challenges beyond our control
- We trust that DOE shares this vision and plans to provide the political, technical, and financial support required

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