1. PURPOSE AND NEED FOR AGENCY ACTION

1.1 INTRODUCTION

This chapter introduces the Proposed Action and describes the purpose and need for the agency action and the scope of the Environmental Impact Statement (EIS). This chapter also summarizes the National Environmental Policy Act (NEPA) of 1969 process, project objectives, and the public scoping process undertaken for this EIS.

This EIS has been prepared by the U.S. Department of Energy (DOE) in compliance with NEPA of 1969 (42 United States Code [USC] 4321 et seq.) regulations for implementing NEPA as established by the Council of Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500 to 1508), and DOE NEPA procedures (10 CFR Part 1021). This EIS evaluates the potential environmental impacts associated with the Proposed Action at each of the four alternative sites. DOE will use this EIS to decide which, if any, of the alternative sites are acceptable to DOE for hosting the FutureGen Project.

1.2 PROPOSED ACTION

DOE proposes to provide financial assistance for the FutureGen Alliance, Inc. (Alliance) to plan, design, construct, and operate the FutureGen Project. Members of the Alliance are presented in Section 1.4. DOE has identified four reasonable alternative sites and will determine which sites, if any, are acceptable to DOE to host the FutureGen Project. The four sites currently being considered as reasonable site alternatives for the FutureGen Project are:

- Mattoon, Illinois;
- Tuscola, Illinois;
- Jewett, Texas; and
- Odessa, Texas.

In a March 2004 Report to Congress, DOE estimated the cost of the project at $950 million in constant 2004 dollars shared at a 74/26 ratio by DOE and the Alliance. Accounting for escalation, based on representative industry indices, the project is currently estimated to cost $1,757,232,310 in as-spent dollars. Including $300,800,000 in expected revenues from the sale of electricity, which would be used to offset operational costs and research and development expenses, the total net project cost is estimated to be $1,456,432,310 in as-spent dollars. DOE will share approximately 74 percent of the net cost (estimated at $1,077,760,230), which includes at least $80 million in projected contributions from foreign governments. The Alliance will share approximately 26 percent of the net cost (estimated at $378,672,080). The cost estimate will be updated as work progresses.

The FutureGen Project would be a research facility as well as the cleanest coal-fueled power system in the world for co-producing electricity and hydrogen (H_2). The facility would incorporate cutting-edge research, as well as development of promising new energy-related technologies at a commercial scale, to achieve DOE's goal of validating the technical and economic feasibility of a coal-fueled power plant that achieves low carbon emissions. A key goal of the project would be to sequester at least 90 percent of the plant's carbon dioxide (CO_2) emissions with the future potential to capture and sequester nearly 100 percent. Low carbon emissions would be achieved by integrating CO_2 capture and sequestration operations with the proposed power plant. Performance and economic test results from the FutureGen Project would be shared among participants, industry, the environmental community, and the public. The Proposed Action is discussed in detail in Chapter 2.

1.3 PURPOSE AND NEED FOR AGENCY ACTION

Agency action is needed to support the President's FutureGen Initiative (February 27, 2003), which is based on recommendations in the National Energy Policy (NEP), issued in May 2001 (NEP, 2001). The NEP cites, in broad terms, the need to promote diverse and secure sources of energy and the expected need for coal to play a significant role in providing that energy. The NEP specifically states, "In the long term, the goal of the [clean coal technology] program is to develop low cost, zero-emission power plants with efficiencies close to double that of today's fleet." Action is also needed to support the President's announcement emphasizing the need for the FutureGen Initiative to support other federal initiatives, including the National Climate Change Technology Initiative (June 11, 2001) and the Hydrogen Fuel Initiative (January 28, 2003). These initiatives aim to reduce the Nation's output of greenhouse gas (GHG) emissions to improve the global environment and provide advanced technologies to meet the world's energy needs.

As the Nation's most abundant fossil fuel resource, coal must play an important role in the Nation's efforts to increase its energy independence. However, there is a need to address the associated environmental and climate change challenges related to the continued use of coal. The Intergovernmental Panel on Climate Change (IPCC) has concluded that global atmospheric concentrations of CO_2 have increased markedly since the pre-industrial period, and that the primary source of the increase results from fossil fuel use (IPCC, 2007). The IPCC was established by the United Nations Environmental Programme and the World Meteorological Organization to assess the scientific, technical, and socioeconomic information relevant for the understanding of human induced climate change.

FutureGen Initiative: *"Today I am pleased to announce that the United States will sponsor a $1 billion, 10-year demonstration project to create the world's first coal-based, zero-emissions electricity and hydrogen power plant. This project will be undertaken with international partners and power and advanced technology providers to dramatically reduce air pollution and capture and store emissions of greenhouse gases. We will work together on this important effort to meet the world's growing energy needs, while protecting the health of our people and our environment."*

President George W. Bush
February 27, 2003

CO_2 accounts for 83 percent of the total U.S. GHG emissions. The CO_2 emissions from the U.S. electric power sector have grown 32 percent since 1990 (compared to 2005), while in comparison, total CO_2 emissions (from all reported sources) have grown by 16.9 percent. Electric power generation now contributes 40 percent of all CO_2 emission in the U.S. In 2005, 82 percent of all electricity production CO_2 emissions resulted from the burning of coal (EIA, 2006).

Fuels used in transportation account for one-third of the Nation's GHG emissions, and an alternative source of transportation fuel, such as coal-derived H_2 fuel, could help reduce GHG emissions. Therefore, methods are needed to more economically and efficiently produce H_2 fuel (e.g., through coal gasification) and to use it for power generation (e.g., through advanced fuel cells).

The FutureGen Project is needed to support these initiatives and recommendations and to foster technology at future low carbon emissions power plants over the next decade to provide the breakthroughs that would dramatically reduce GHG emissions over the longer term. Widespread replication of low carbon emissions technology by the private sector would help meet the needs of our Nation's economy, while reducing risks associated with emissions of GHGs.

1.4 FUTUREGEN PROJECT

The FutureGen Project would provide a platform to test advanced technologies for producing both electricity and H_2 from coal (DOE, 2003). DOE, as well as other parties, may conduct technology research and development activities using this platform. Electricity and H_2 production would be based on the design concept known as the Integrated Gasification Combined Cycle (IGCC) system, which has the potential for increasing energy conversion efficiency while reducing air pollutant emission rates. Geologic sequestration of CO_2 would be a unique component of the project and would help achieve low carbon emissions during normal steady-state operation. CO_2 would be captured and sequestered (i.e., stored) in deep underground saline formations.

IGCC is a coal-fired, integrated gasification combined cycle electric power generation system with capability for both pre- and post-combustion emission controls.

Geologic Sequestration is the placement of CO_2 or other GHGs into a geologic formation in such a way that it remains permanently stored.

A **gasifier** produces a combustible gas from coal. The gas fuels a combustion turbine (similar to an aircraft engine) to produce electricity. Heat coming out of the combustion turbine is used to generate steam that powers a steam turbine for additional production of electricity.

The lead organization for the proposed federal action is the National Energy Technology Laboratory (NETL), a multi-purpose laboratory operated by DOE's Office of Fossil Energy. NETL has a mission to solve the environmental, supply, and reliability constraints of producing and using fossil energy resources to promote a stronger economy and a more secure future for America. The DOE goal for this project is to prove the technical feasibility and potential economic viability of co-production of electricity and H_2 fuel from coal, while capturing and sequestering CO_2 and greatly reducing other air emissions.

The Alliance, formed to partner with DOE on the FutureGen Project, is a non-profit consortium of some of the largest coal producers and electricity generators in the world. Member companies are American Electric Power, Anglo American Services Limited, BHP Billiton Energy Coal Inc., China Huaneng Group, CONSOL Energy, E.ON U.S. LLC, Foundation Coal Corporation, Peabody Energy Corporation, PPL Energy Services Group LLC, Rio Tinto Energy America Services, Southern Company Services, and Xstrata Coal. Collectively, these member companies have global operations serving customers across six continents (FG Alliance, 2006). The Alliance, using the siting process described in Chapter 2, Proposed Action and Alternatives, identified the four sites that DOE has determined are the reasonable site alternatives to be considered in this EIS.

1.4.1 FUTUREGEN PROJECT TECHNOLOGY

While IGCC technology is currently used in coal-fueled power plants in both the U.S. and abroad, none of these plants includes a geologic sequestration or H_2 production component. Objectives for the FutureGen Project are presented in Table 1-1 in Section 1.4.2, as derived from DOE's March 2004 Report to Congress (DOE, 2004).

In a typical IGCC power plant, the gasification process combines coal, oxygen (O_2), and steam to produce a H_2-rich combustible gas, called ''synthesis gas.'' The FutureGen Project would be different because, after the gas exits the gasifier, the composition of the synthesis gas would then be ''shifted'' by the addition of water vapor to produce additional H_2. The product stream would then consist mostly of H_2, steam, and CO_2. After separation of these three gaseous components, the H_2 would be used to generate electricity in a gas combustion turbine. Steam from the process would then be condensed, treated, and recycled into the gasification system or added to the plant's cooling water circuit. CO_2 from the process would be sequestered in deep underground geologic formations that would be monitored to verify the permanence of CO_2 storage.

1.4.2 FUTUREGEN PROJECT OBJECTIVES

The FutureGen Project would be designed to create a capability for full-scale testing of new technologies in support of their commercial deployment. The FutureGen Project may integrate some combination of new technologies for gasification, O_2 production, H_2 production, synthesis gas cleanup, H_2 turbines, CO_2 sequestration, advanced materials, instrumentation, sensors and controls, byproduct use, and water management. Decisions regarding the incorporation of specific technologies in plant design would be made by the Alliance in coordination with DOE. Technologies identified would be consistent with the overall project objectives (see Table 1-1).

Table 1-1. FutureGen Project Objectives

Overall Objectives
• Establish technical and economic feasibility of producing electricity and H_2 from coal with reduced GHG emissions; • Verify sustained, integrated operation of a coal conversion system with geologic sequestration of CO_2; • Verify the effectiveness, safety, and permanence of geologic sequestration of CO_2; • Establish standardized technologies and protocols for geologic CO_2 sequestration monitoring, mitigation, and verification (MM&V); • Confirm the potential of the FutureGen Project concept to achieve economic competitiveness with other approaches through advances in technology by 2020; and • Gain acceptance by the coal and electricity industries, environmental community, international community, and public-at-large for the concept of coal-fueled systems with near-zero emissions through the successful operation of the FutureGen Project.
Facility Performance Objectives
• Capture at least 90 percent of CO_2 and sequester CO_2 at an operational rate of at least 1.1 million tons (1 million metric tons [MMT]) per year in a deep saline formation; • Produce electricity and H_2 consistent with market needs at ratios equivalent to 275 megawatt net output; • Locate plant consistent with adequate coal feedstock availability, proximity to market for products (especially electricity) as part of proving potential economic viability, and proximity to geologic formations for sequestration (e.g., deep saline formations, unmineable coal seams, depleted oil and natural gas reservoirs, and basalt formations); • Achieve environmental requirements; • Provide a design database for subsequent commercial demonstrations or deployments; and • Design a capability for full-flow testing of advanced technologies and advanced technology modules, and design incorporation of loosely integrated units that increase flexibility and enhance operability and reliability.
CO_2 Sequestration, Monitoring, Mitigation, and Verification Objectives
• Accurately quantify storage potential of the geologic formation(s); • Detect and monitor surface and subsurface leakage, if it occurs (with capability to measure CO_2 slightly above atmospheric concentration of 370 parts per million), and demonstrate effectiveness of mitigation; • Provide the scientific basis for carbon accounting and assurance of permanent storage; • Account for co-sequestration of CO_2 and other gases; and • Develop information necessary to estimate costs of future CO_2 management systems.

Source: DOE, 2004.

1.5 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA requires all federal agencies to include, in every recommendation or report on proposals for major federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on (1) the environmental impact of the Proposed Action; (2) any adverse environmental effects that cannot be avoided should the proposal be implemented; (3) alternatives to the Proposed Action; (4) the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and (5) any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented. The Act also requires consultations with federal agencies that have jurisdiction or special expertise with respect to any environmental impact involved. The detailed statement along with the comments and views of consulted governmental agencies, must be made available to the public.

DOE determined that providing financial assistance for the construction and operation of the FutureGen Project would constitute a major federal action that could significantly affect the quality of the natural and human environment. Therefore, DOE has prepared this EIS in compliance with requirements for implementing NEPA as established by the CEQ regulations (40 CFR Parts 1500 to 1508), DOE regulations (10 CFR Part 1021), and DOE procedures for implementing NEPA.

DOE published an Advance Notice of Intent (ANOI) to prepare an EIS in the *Federal Register* on February 16, 2006 (71 FR 8283). Later, DOE published a Notice of Intent (NOI) in the *Federal Register* on July 28, 2006 (71 FR 42840) to initiate public scoping, as described in Section 1.6.1, to begin the NEPA process and the public scoping process to identify the reasonable site alternatives. Both DOE and the Site Proponents consulted with various interested governmental agencies to further define the scope of the EIS. Coordination letters resulting from these consultations are provided in Appendix A.

Following publication in the *Federal Register* of a Notice of Availability (NOA) of the Draft EIS by the U.S. Environmental Protection Agency (EPA), there ***was*** a 45-day public review and comment period. During this period, public hearings ***were*** held at locations near each of the alternative sites. DOE consider***ed*** and respond***ed*** to comments received on the Draft EIS both individually and collectively and ***this*** Final EIS addresses the comments received. Not less than 30 days after EPA publishes an NOA of the Final EIS, DOE will publish a Record of Decision (ROD) in the *Federal Register* that explains the agency's decision on whether to fund the FutureGen Project and, if so, which of the alternative sites would be acceptable to host the FutureGen Project.

1.6 SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

1.6.1 NEPA SCOPING PROCESS

This EIS assesses the potential environmental impacts of the Proposed Action at each of four candidate sites within the scope of the FutureGen Project and the No-Action Alternative. The scope of this EIS was determined by DOE after consultation with state and federal agencies and involvement of the public.

Figure 1-1 illustrates the steps during the EIS process. DOE published an ANOI to prepare the EIS in the *Federal Register* on February 16, 2006 (71 FR 8283). Later, DOE published a NOI in the *Federal Register* on July 28, 2006, to identify the reasonable site alternatives and initiate the public scoping process (71 FR 42840).

During the public scoping period, DOE solicited public input to ensure that (1) significant issues would be identified early and properly studied; (2) issues of minimal significance would not consume

excessive time and effort; and (3) the EIS would be thorough and balanced. The public scoping period ended on September 13, 2006, after a 47-day comment period.

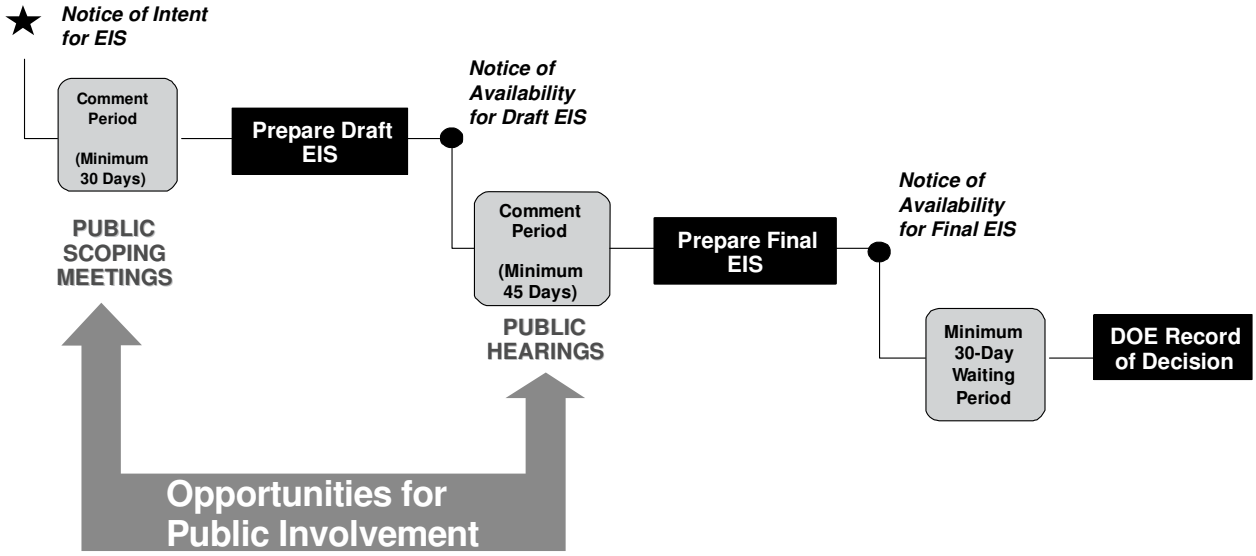

Figure 1-1. Steps in the NEPA Process

DOE published a Notice of Public Scoping Meetings in the *Federal Register* on August 4, 2006 (71 FR 44275). There were four public scoping meetings for the FutureGen Project EIS with one held near each of the alternative sites. The dates and locations of these meetings are shown in Table 1-2. DOE published notices in local newspapers announcing the meeting locations and times during the weeks of August 13, 20, and 27, 2006.

Table 1-2. Public Scoping Meeting Locations and Dates

Public Meeting Location	Date
Mattoon, Illinois Riddle Elementary School, Mattoon, Illinois	August 31, 2006
Tuscola, Illinois Tuscola Community Building, Tuscola, Illinois	August 29, 2006
Jewett (Fairfield), Texas City of Fairfield's Green Barn, Fairfield, Texas	August 22, 2006
Odessa (Midland), Texas Center for Energy and Economic Diversification (CEED) Building, Midland, Texas	August 24, 2006

Each scoping meeting began with an informal open house from 4:00 pm to 7:00 pm during which time attendees were given information packages about the project and were able to view project-related posters. DOE and Alliance representatives were available to answer questions. Alliance representatives were also available at displays illustrating various features of the proposed project. The informal open house was followed by a formal DOE presentation and the formal comment period. Appendix B provides additional information on the NEPA public scoping process.

1.6.2 PUBLIC SCOPING COMMENTS RECEIVED

DOE accommodated several methods for submitting comments on the scope of the EIS. A court reporter was present at each meeting to ensure that all spoken comments during the formal meeting were recorded and transcribed. In addition, anyone who wished to give comments in writing was invited to do so at the public meetings by completing a comment card and submitting it to DOE at the meeting. DOE also offered an e-mail address, a postal address, a facsimile number, and a toll-free telephone number for members of the public to submit their comments. In all, respondents submitted 318 comments via e-mail, mail, facsimile, telephone, or formal oral comment at the public meetings.

The majority of the comments were related to the use of natural resources (e.g., coal, land, and water), the discharge of pollutants to the natural environment (e.g., air and water), and the socioeconomic impacts of the project (e.g., jobs, taxes, and property values). Table 1-3 lists the composite set of issues identified during public scoping for consideration in the EIS. Issues are discussed and analyzed in this EIS in accordance with their relative importance. The most detailed analyses focus on air quality, water resources, noise, and safety, health, and accidents.

Table 1-3. Issues Identified During Public Scoping

Purpose and Need
• Demonstration of need for the proposed project. • Consideration of alternatives such as wind or solar power, energy conservation.
Environmental Resources
• Air Quality: Potential impacts from air emissions (including mercury, volatile organic compounds [VOCs], and particulate matter [PM]) during construction and operation of the power plant and impacts to sensitive receptors. Impacts of dust from construction, transportation, and storage of materials. Potential impacts on National Ambient Air Quality Standards (NAAQS). • Geology and Soils: Potential for activation of surface or subsurface faults. Potential for seismic activity from carbon sequestration. • Water Resources: Potential impact to drinking water supplies and freshwater aquifers. Potential impacts to surface water and groundwater flow and to water resources from wastewater discharge or runoff. • Wetlands and Floodplains: Potential impacts to wetlands and floodplains. • Ecological Resources: Potential on-site and off-site impacts to vegetation, terrestrial and aquatic wildlife, threatened and endangered species, and ecologically sensitive habitats. • Cultural Resources: Potential for impacts to Native American cultural resources. • Land Use: Potential impacts to prime farmland and conversion of land use from farming to industrial use. Use of site after plant closure. Property rights to store CO_2 under adjoining property. • Aesthetics: Impacts on viewsheds to residences, including views of transmission lines. • Transportation and Traffic: Potential impacts to local traffic patterns, safety at railroad crossings, and traffic controls. Transportation and roadway infrastructure impacts from rail and truck transport of coal to the plant. Need for upgrades or improvements to local roadway infrastructure. • Noise and Vibration: Noise levels generated from the unloading of coal from railcars and switching the train cars. Impacts to sensitive receptors from increased noise levels. • Materials and Waste Management: Impact of accumulating piles of ash/slag and sulfur generated by the gasification process. Reuse or disposal of byproducts of the coal gasification process. The method and location by which solid and hazardous waste would be disposed, including mercury containing materials and ash/slag. • Human Health, Safety, and Accidents: The potential danger of an explosion at the plant to local community and the community safety measures that would be taken. The potential danger of a terrorist attack. Potential impact of electromagnetic fields on people who live near the proposed transmission lines, substations, and transformers. • Risk Assessment: Development of a monitoring program of the carbon sequestration to detect leaks from the carbon sequestration system and a maintenance program to repair leaks. Potential for a catastrophic release and the actions that would be taken in the event of a release. Potential for carbon sequestration to reverse subsidence. Potential for releases through oil, gas, or water wells to the aquifer system and potential impacts

Table 1-3. Issues Identified During Public Scoping

to these existing wells. Stress limits of the CO_2 injection system and prediction of when CO_2 migration will stop in relation to property boundaries on the surface. Potential for sequestered CO_2 to impact drinking water sources and the risk of movement between aquifers or into the atmosphere.
• Community Services and Socioeconomics: Socioeconomic impacts on local job market, taxes, and impacts to property values, and commercial and residential growth. Use of the power plant after DOE involvement has ended. Impacts to emergency services (e.g., police and fire support).
Cumulative Impacts
• Cumulative Impacts: Potential cumulative impacts that could result from the incremental impacts of the proposed project when added to the other past, present, and reasonably foreseeable future projects.

DOE has addressed all substantive comments in this EIS. However, some comments received are outside the scope of this EIS. For example, several respondents indicated that the EIS should include alternatives such as the utilization of renewable energy resources (e.g., wind and solar power). Because the particular goal of the FutureGen Project is to demonstrate an advanced power generation facility based on fossil fuels, specifically coal, technologies that would not be based on coal use are not within the scope of this EIS. However, DOE oversees numerous programs that are investigating and supporting a wide variety of energy generation technologies, including many based on renewable sources, as well as programs that promote energy conservation. Questions were also raised regarding the environmental and safety impact of coal mining. However, coal is a commercial fuel produced by a regulated industry. There would be no change in nationwide coal production and, therefore, there should be no change in environmental impacts to mining. Hence, DOE considers the environmental impacts of coal mining policies and operations to be outside the scope of this EIS.

1.6.3 AGENCY DECISION-MAKING PROCESS

NEPA requires that agencies evaluate reasonable alternatives to the Proposed Action in an EIS. The purpose and need for the agency action determines the range of reasonable alternatives. In this case, DOE proposes to provide financial assistance to the Alliance for the design, construction, and operation of the first coal-fueled plant to produce electricity and H_2 with geologic sequestration of CO_2. DOE believes the electric utility and coal industries should lead the project because of their experience in implementing power plant projects and because those industries have a significant interest in the success and subsequent commercial deployment of low carbon emissions technology.

In particular, this EIS identifies and analyzes the potential environmental impacts of the FutureGen Project at the four alternative site locations. Should more than one site be approved by DOE in a ROD, the host site would be selected by the Alliance. Once the host site is selected, the Alliance would conduct additional site characterization studies; prepare a site-specific design; and obtain relevant environmental, utility, and operational permits for the project. Appendix C provides a summary of potential federal and state permits and requirements.

Decisions on incorporation of specific technologies would be made by the Alliance consistent with the overall project goal of proving the technical and economic feasibility of carbon capture and geologic sequestration emissions. When identifying technology alternatives, the Alliance started with a list of major components and subsystems of the power plant facility and then created a matrix of potential configurations of equipment. The matrix of potential configurations has been gradually reduced to a general configuration and list of conservative operating parameters (e.g., an upper bound for possible air emissions of various pollutants, other waste streams, and land impacts) that serve as the basis for the analyses in this EIS.

Descriptions of the alternatives and evaluations of potential impacts included in this EIS are intended to assist the federal decision-makers in choosing whether to fund the project and which sites, if any, should be considered further. If DOE elects to provide further financial assistance for the FutureGen Project, the agency may also specify measures to mitigate potential impacts as identified in the NEPA process. In the absence of DOE funding (the No-Action Alternative), the Alliance may still elect to construct and operate the proposed IGCC power plant if it can obtain the additional funding and required permits. However, in the absence of DOE participation, it is unlikely the FutureGen Project would be implemented.

No sooner than 30 days after publication of EPA's NOA of the Final EIS in the *Federal Register*, DOE will announce in a ROD selection of either the No-Action Alternative or the Proposed Action with those sites acceptable to DOE. If DOE decides to implement the Proposed Action, the Alliance will subsequently select a host site from among those sites, if any, that are identified in the ROD as acceptable to DOE.

After selection of the host site, the Alliance would conduct additional site characterization work on the chosen site. This information would support site-specific design work for the FutureGen Project. Both the additional site information and the site-specific design work would be reviewed by DOE and would support the completion of a Supplement Analysis (see 10 CFR 1021.314) by DOE to determine if there are substantial changes in the Proposed Action or significant new circumstances or information relevant to environmental concerns, as discussed in 40 CFR 1502.9(c). Based on the Supplement Analysis, DOE will determine whether a Supplemental EIS should be prepared.

1.6.3.1 Interagency Cooperation

EPA staff participated in the development of the site selection criteria used in the solicitation and evaluation of the site proposals, reviewed and provided input to DOE's plan for conducting a risk assessment of underground storage of CO_2, and reviewed and commented on the preliminary version of ***the*** Draft EIS.

1.6.3.2 Relationship Between DOE and the Alliance

On March 23, 2007, DOE and the Alliance signed a Full Scope Cooperative Agreement (the Agreement) to undertake the FutureGen Project. The Agreement defines the terms and conditions for financial assistance, including DOE's oversight role. Under the Agreement, the Alliance would be primarily responsible for implementing the FutureGen Project. DOE would guide the Alliance at a programmatic level to ensure that the FutureGen Project meets DOE's objectives. In addition to programmatic-level guidance, DOE retains certain review and approval rights for major project decisions and oversees the Alliance's compliance with the terms of the Agreement. The FutureGen Project is comprised of six budget periods with continuation of the project into each subsequent budget period contingent upon the approval of a continuation application. The first budget period (Budget Period 0) was completed under a Limited Scope Cooperative Agreement that provided an opportunity to examine the feasibility of the project. The current Budget Period 1 of the Full Scope Cooperative Agreement will cover the remainder of the NEPA process, site selection, detailed characterization of the selected site, and preliminary design work. Figure 1-2 illustrates the Full Scope Cooperative Agreement Timeline.

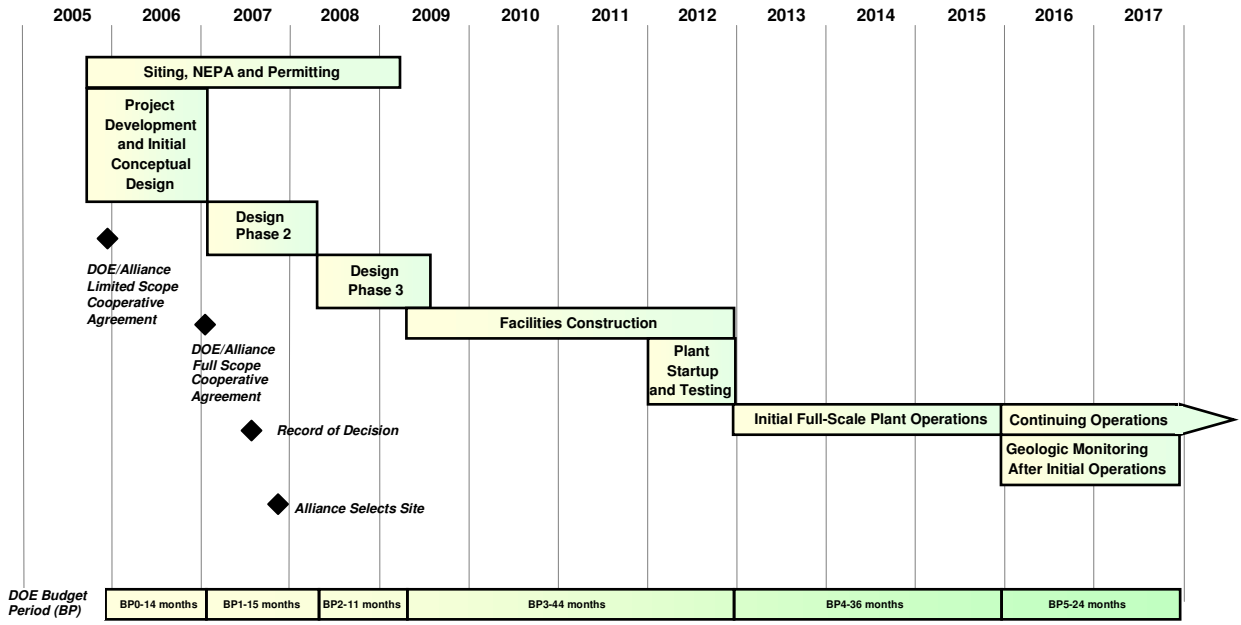

Figure 1-2. FutureGen Project Full Scope Cooperative Agreement Timeline

The FutureGen Project would move between budget periods only after DOE review and approval of continuation applications submitted by the Alliance. Continuation funding would be contingent on (1) availability of funds; (2) satisfactory progress towards meeting the objectives of the previously approved application; (3) compliance with the terms and conditions of the Agreement; and (4) such other terms as the parties agree.

The Alliance would hold legal title to the FutureGen facility subject to DOE's rights under DOE regulations and the Agreement. During the performance of the Full Scope Cooperative Agreement, DOE and the Alliance would develop a mutually acceptable plan for project disposition, which may include continued operation of the facility by the Alliance or some other party in a research or commercial mode.

DOE is responsible for NEPA compliance. For the alternative sites, the Alliance and the Site Proponents (Mattoon and Tuscola, Illinois and Jewett and Odessa, Texas) have provided design information and planning details and facts, which have been independently reviewed by DOE. Information supplied by the Alliance and by the Site Proponents has been reviewed and verified by DOE and used in preparation of this EIS.

1.7 PUBLIC HEARINGS

DOE announced the availability of the Draft EIS in a NOA published in the Federal Register on June 1, 2007. During the comment period (June 1, 2007 to July 167, 2007), the DOE held four public hearings for the FutureGen Project Draft EIS; the dates and locations of these hearings are shown in Table 1-4. The hearing locations were selected based on their close proximity to the alternative site locations in Texas and Illinois. Three of the four hearings were in the same locations as the scoping meetings. The public hearings were announced in the June 1, 2007, Federal Register notice. In addition, DOE published notices in local newspapers during the weeks of June 11, 18, and 25, 2007.

Table 1-4. Public Hearing Locations and Dates

Location	Date
Odessa (Midland), Texas Center for Energy and Economic Diversification (CEED) Building, Midland, Texas	June 19, 2007
Jewett (Buffalo), Texas Buffalo Civic Center, Buffalo, Texas	June 21, 2007
Mattoon, Illinois Riddle Elementary School, Mattoon, Illinois	June 26, 2007
Tuscola, Illinois Tuscola Community Building, Tuscola, Illinois	June 28, 2007

Comments on the Draft EIS were received during the comment period via telephone, fax, e-mail, and mail. In addition, comment forms were completed and given to DOE during the public hearings. Oral comments were also given and transcribed at each of the public hearings.

Each public hearing began with an informal open house from 4:00 to 7:00 pm (Central Daylight Saving Time) during which time attendees were given information packages about the project and were able to view project related posters. DOE FutureGen Project personnel were available to answer questions. Representatives of the FutureGen Alliance, Inc. and local representatives were also available at displays illustrating various features of the proposed project and proposed sites.

The informal open house was followed by a formal DOE presentation and the formal public hearing. Collectively, 554 individuals attended the public hearings (see Table 1-5); a few individuals attended more than one meeting.

Table 1-5. Number of People in Attendance at Public Hearings

Meeting Location	Number of People in Attendance[1]
Odessa (Midland), Texas	76
Jewett (Buffalo), Texas	124
Mattoon, Illinois	151
Tuscola, Illinois	203
Total	554

[1] Based on individuals who signed the attendance sign-in sheets.

All attendees were invited to provide comments, either written or spoken, on the proposed project. Those attendees wishing to speak were given an opportunity to sign up to do so. Comment sheets were made available for all attendees wishing to provide written comments.

DOE led the presentations and presided over the four formal meetings. A court reporter was present at each meeting to ensure that all oral comments were recorded and legally transcribed. A total of 60 individuals presented oral comments. In addition, individuals could request to receive the Draft EIS and/or the Final EIS (either a hard copy or a hard copy summary plus a CD containing the entire EIS).

Anyone who wished to provide comments in writing was invited to do so by completing a comment card and giving it to a DOE FutureGen Project Team member at the public hearing or mailing in a postcard format comment card at a later date. DOE also provided an e-mail address for members of the public who preferred to submit their comments electronically, a postal address for those who preferred to mail their comments, a telephone fax number for those who preferred to fax their comments, and a toll-free telephone number for those who preferred to provide spoken comments.

In preparing the Final EIS, DOE considered all comments to the extent practicable. An identification number was assigned to each originator of comments (i.e., per commentor), including those verbally expressed at the public hearings. A total of 175 individuals, organizations, and agencies provided comments on the Draft EIS. A majority of the comments received stated support for the project. After reviewing the comment documents received, a list of issues was developed (see Table 1-6).

Table 1-6. General Comments from Public Hearings

Aesthetics	*Concerns were expressed regarding the design of the plant. Comments were received requesting that the FutureGen Plant be aesthetically pleasing.*
CO_2 Sequestration	*Concerns were expressed regarding the sequestration of CO_2. Specifically:* • *potential for long term effects of injected CO_2 in the subsurface-mingling of CO_2 with deep subsurface gasses;* • *the manner in which CO_2 stays underground;* • *potential for well leaks and pipeline leaks;* • *hazardous properties of CO_2 (in the pipelines and wells);* • *impacts of CO_2 on coal mining; and* • *short-term fate, ultimate fate, plume growth and movement and potential for earthquakes to either affect the storage or to be generated by the storage of CO_2.*
Economy, Employment, and Income	*Individuals questioned whether there would be compensation for CO_2 storage under their property. They also expressed concern about property devaluation, crop reduction, and impacts to taxpayers. Individuals asked about potential employment opportunities at the FutureGen plant.*
Farming	*Concerns were expressed regarding impacts to farming and whether farmers will be compensated for their losses (e.g., field tiles or fertilizer).*
Groundwater	*Concerns were expressed regarding the sources of and impacts to groundwater.*
Noise	*Individuals expressed concern about noise from traffic and operations.*
Public Outreach	*Individuals requested access to DOE-sponsored animations or model demonstrations of geologic sequestration. Individuals would like further educational outreach on the topic of geologic sequestration.*
Risk Assessment	*Individuals living close to the proposed site locations expressed concern about the risks of leakage, the routes of leakage, and health effects. Individuals also questioned why Mattoon has higher risks under the accident and terrorism scenarios.*
Surface Water	*Individuals expressed concerns about controlling runoff from the power plant site and how rainfall runoff and downstream flooding will be mitigated.*
Technology	*People expressed concern that the technology associated with FutureGen will be outdated by the time the plant is constructed.*
Waste disposal	*Individuals expressed concern regarding the handling and disposal of waste such as ash, slag, mercury, arsenic and hazardous wastes.*

1.8 SUMMARY OF MAJOR CHANGES IN THE EIS

Comments received on the Draft EIS are detailed in Volume III, Chapter 13 (Comments and Responses on the Draft EIS). DOE has responded to these comments and addressed them in the Final EIS, as appropriate. A summary of the major comments and revisions in the EIS is provided as follows:

Preferred Alternative – DOE identified its Preferred Alternative, to provide financial assistance to the FutureGen Project, in the Summary, Section S.4.5 and Volume I, Chapter 2, Section 2.4.8.

Public Hearings Summary – A detailed discussion of the public hearings held in June 2007 is provided in Volume III, Chapter 13, and is summarized in the Summary, Section S.5.2 and in Chapter I, Section 1.7.

New Options for Mattoon Water Pipeline and Odessa Water and CO_2 Pipelines and for Mattoon Water Pipeline - To complete the site proposal process, the Alliance offered an opportunity for the Site Proponents to submit Best and Final Offers (BAFOs) on their proposals. Pursuant to directions from the Alliance, the four Site Proponents submitted BAFOs to the Alliance on August 1, 2007.

The Odessa and Mattoon Site Proponents provided additional water and CO_2 pipeline options for the Alliance to consider in its final siting decision. Neither the Tuscola nor Jewett Site Proponents put forward additional options or modifications for consideration that might have potential environmental impacts. Other information provided by the Site Proponents in their BAFOs relates solely to potential business arrangements between the Alliance and the Site Proponents.

The new Mattoon and Odessa options were not described in the Draft EIS. Nevertheless, as variations of the alternatives in the Draft EIS, DOE considered the potential environmental consequences of the new options in the Final EIS. New text is provided in the Summary in Section S.4.3 and in Volume I, Chapter 2, Sections 2.4.4 and 2.4.5.

Odessa CO_2 Pipeline Option – After issuance of the Draft EIS, continuing Alliance and DOE investigations revealed that it would not be feasible to transport CO_2 from the proposed power plant site at Odessa to the proposed injection well site using the PetroSource Val Verde CO_2 pipeline located east of the injection site, as stated in the Draft EIS. Therefore, Odessa has offered two additional CO_2 pipeline options.

Text describing the new Odessa CO_2 pipeline options has been added to the Final EIS in the Summary (Sections S.4.2.4, Table S-4), Volume I, Chapter 2 (Proposed Action and Alternatives, Sections 2.4.4, 2.4.5) and in Volume II, Chapter 7 (Section 7.1.3, Table 7.1-1).

Continuous Monitoring Methods - Public concerns were raised regarding monitoring of the injection of CO_2. A new subsection titled Continuous Monitoring Methods was added to Section 2.5.2.2, Monitoring, Mitigation, and Verification in the Final EIS that describes various monitoring systems that could be implemented. Such systems could include a Supervisory Control and Data Acquisition (SCADA) system to continuously monitor and transmit flow rate, pressure, and temperature information from the injection wells to a central data collection point; Eddy Covariance tower(s) to measure atmospheric CO_2 concentrations; detectors installed at the wellheads; and the use of micro-tiltmeters and monitoring wells.

Noise Monitoring – Commentors stated they had concerns about noise levels related to the operation and construction of the FutureGen Project and increased traffic during construction and

operation. DOE collected additional noise monitoring information in June 2007 at each of the four alternative site locations. DOE used the Federal Highway Administration's (FHWA's) Traffic Noise Model, Version 2.5, which considers roadway geometry, vehicle speed, and traffic direction, to predict the increase in noise generated by project-related construction and operation activities. The noise analysis was conducted to evaluate the impacts at mobile source receptors whenever the 3-dBA threshold was exceeded. The results of the noise monitoring conducted in June 2007 are provided in the Summary, Table S-12; Volume I, Chapter 3, Section 3.1.14 and Table 3-3; and in Volume II, Sections 4.14, 5.14, 6.14, and 7.14 of the Final EIS.

Potential for Release during Co-Sequestration - Additional model simulations of pipeline ruptures or punctures to represent releases during the co-sequestration experiment were conducted and the results are discussed in the revised Risk Assessment report and the Final EIS in Volume I, Chapter 3, Section 3.1.17.

Cumulative Impacts – Air Quality- Comments were received about the inclusion of emission sources in the vicinity of the Jewett Site that would contribute to cumulative impacts to air quality, particularly power plants that are no longer being considered. The following projects were deleted from cumulative air impacts: Big Brown, Lake Creek, and Trading House Units 3 and 4. Text was revised in the Final EIS in the Summary, Section S.10.2, Table S-14; and in Volume I, Chapter 3, Section 3.3.3.2, Table 3-7.

Cumulative Impacts - Water Supply – Public concerns were raised about this project causing cumulative impacts to water supply resources at the alternative site locations. Revised text that more fully explains the water supply sources and the potential demand on water supply sources was added to the Final EIS in the Summary, Section S.10.3, and Volume I, Chapter 3, Section 3.3.4.

Radionuclides and Radon – DOE received a comment concerning radioactive isotopes in coal. New text was added to Volume II, Chapters 4, 5, 6, and 7 in the air quality sections 4.1, 5.1, 6.1, and 7.1 of the Final EIS that describes the radionuclide in coal, the potential for radionuclide emissions from coal-fired boilers; the fate of radionuclides in a coal combustion power plant; and the proposed use of extremely high particulate control at FutureGen compared to conventional coal plants.

Alternative Power Sources – Several commentors questioned why other sources of power such as wind or solar energy were not being considered in place of coal power. The comment-response document in Volume III, Chapter 13, responds to this general comment as follows (no change was made to the EIS):

DOE oversees numerous programs that are investigating and supporting a wide variety of renewable energy generation technologies, including wind, solar, and hydro. However, the particular goal of the FutureGen Program is to demonstrate an advanced power generation facility based on fossil fuels, specifically coal. Hence, technologies that would not be based on coal use are not within the scope of the FutureGen Project.

Comments and Responses on the Draft EIS – Volume III, Chapter 13 contains copies of all comments that were received by DOE on the Draft EIS. Individual responses to comments are provided in Volume III, Chapter 13.

Risk Assessment Report – Additional model simulations of pipeline ruptures or punctures to represent releases during the co-sequestration experiment were conducted, as discussed in the revised Risk Assessment. These results show that the distance where the public could be exposed to H_2S at levels that could result in adverse effects are significantly greater than for the base case, and thus more people could be exposed, if a release occurred during an experiment. A summary of the risk results for

the co-sequestration experiment is found in the Risk Assessment Report, Section 4.5.5. Details on the modeling for the experiment are found in Appendix C, Section C.5, and C.6 of the report.

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