

# EXHIBIT B

**ASSISTANCE AGREEMENT**

1. Award No. DE-FE0005054		2. Modification No. 014	3. Effective Date 02/01/2013	4. CFDA No. 81.130	
5. Awarded To FutureGen Industrial Alliance, Inc Attn: Ken Humphres 1101 PENNSYLVANIA AVENUE NW 6TH FLOOR STE 6613 WASHINGTON DC 200042514			6. Sponsoring Office Office of Fossil Energy		7. Period of Performance 10/01/2010 through 12/31/2018
8. Type of Agreement <input type="checkbox"/> Grant <input checked="" type="checkbox"/> Cooperative Agreement <input type="checkbox"/> Other		9. Authority See page 2 for full authority		10. Purchase Request or Funding Document No. 13FE001651	
11. Remittance Address FutureGen Industrial Alliance, Inc Attn: Ken Humphres 1101 PENNSYLVANIA AVENUE NW 6TH FLOOR STE 6613 WASHINGTON DC 200042514			12. Total Amount Govt. Share: \$589,744,000.00  Cost Share : \$602,762,038.00  Total : \$1,192,506,038.00		13. Funds Obligated This action: \$0.00  Total : \$589,744,000.00
14. Principal Investigator Ken Humphreys Phone: 509-521-7784		15. Program Manager Nelson F. Rekos Phone: 304-285-4066		16. Administrator U.S. DOE/NETL Pittsburgh Campus 626 Cochrans Mill Road PO Box 10940 Attn: Brittlely Robbins Pittsburgh PA 15236-0940	
17. Submit Payment Requests To OR for NETL (Pittsburgh) U.S. Department of Energy Oak Ridge Financial Service Center P.O. Box 4967 Oak Ridge TN 37831			18. Paying Office OR for NETL (Pittsburgh) U.S. Department of Energy Oak Ridge Financial Service Center P.O. Box 4967 Oak Ridge TN 37831		19. Submit Reports To
20. Accounting and Appropriation Data					
21. Research Title and/or Description of Project RECOVERY ACT: FUTUREGEN 2.0 - OXY-COMBUSTION LARGE SCALE TEST					
For the Recipient			For the United States of America		
22. Signature of Person Authorized to Sign			25. Signature of Grants/Agreements Officer  Signature on File		
23. Name and Title		24. Date Signed	26. Name of Officer Keith R. Miles		27. Date Signed 02/01/2013

**CONTINUATION SHEET**

REFERENCE NO. OF DOCUMENT BEING CONTINUED  
DE-FE0005054/014

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NAME OF OFFEROR OR CONTRACTOR  
FutureGen Industrial Alliance, Inc

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	<p>DUNS Number: 603703799</p> <p>-----</p> <p>Continued from Block 9, Authority: PL 95-91 DOE Organization Act, PL 111-5 American Recovery and Reinvestment Act of 2009 and PL 109-58 Energy Policy Act 2005</p> <p>-----</p> <p>See attached Terms and Conditions plus Attachments 1 through 6.</p> <p>-----</p> <p>POINTS OF CONTACT:</p> <p>DOE Award Administrator/Contract Specialist Brittley Robbins (412) 386-5430 Brittley.Robbins@netl.doe.gov</p> <p>DOE Program Manager/Project Officer Nelson Rekos (304) 285-4066 Nelson.Rekos@netl.doe.gov</p> <p>FGIA Business Officer Frans Klinkenbergh Phone: 202-742-6762 E-Mail: FKlinkenbergh@futgen.org</p> <p>FGIA Project Manager Ken Humphreys Phone: 509-521-7784 E-Mail: humphreysk@futgen.org</p> <p>-----</p> <p>ASAP: NO: STD IMMEDIATE Extent Competed: NOT COMPETED Davis-Bacon Act: YES PI: Ken Humphreys Fund: 05899 Appr Year: 2009 Allottee: 31 Report Entity: 220323 Object Class: 25500 Program: 1611010 Project: 2003000 WFO: 0000000 Local Use: 0000000</p>				

**Background:** On September 29, 2010, DOE awarded approximately \$1 billion in funding appropriated by the American Recovery and Reinvestment Act (ARRA) to the two projects that constitute the FutureGen 2.0 program: (1) Ameren Energy Resource's (Ameren) repowering of one of its electrical generating units at its Meredosia Energy Center using oxy-combustion combined with CO<sub>2</sub> capture (the power plant project) under Cooperative Agreement DE-FE0005054); and (2) the FutureGen Industrial Alliance's (Alliance) CO<sub>2</sub> transportation and injection project, consisting of a pipeline and a facility to inject CO<sub>2</sub> into a deep geologic formation (the sequestration project) under Cooperative Agreement DE-FE0001882).

In the summer of 2011, Ameren informed DOE of a projected \$363 million increase in the cost of the power plant project and that it would not continue the project beyond Phase I. The Alliance announced that it would negotiate with Ameren to purchase the facilities Ameren had intended to use for the power plant project and would request that DOE approve a novation of this Cooperative Agreement to the Alliance. In addition to seeking a novation, the Alliance requested (through the submission of Phase II Decision Point Applications (DPAs)) that the Department reduce the non-federal cost share to 1 percent for both projects until all of the ARRA funding was expended, and that DOE authorize the Alliance to take both projects into Phase II.<sup>1</sup>

The Office of Fossil Energy conducted in-depth reviews of the DPAs and the novation request that identified significant risks to the Alliance's ability to achieve financial close as a result of risks regarding schedule, capabilities, cost, and ability to obtain financing. These risks are set forth in greater detail in a memorandum from the Assistant Secretary of Fossil Energy dated January 30, 2013. On December 26, 2012, the Secretary directed the Office of Fossil Energy to begin negotiating with the Alliance on the conditions and requirements for novating this Cooperative Agreement and authorizing the Alliance to take both projects into Phase II. The conditions and requirements were to include, among other things,: (1) expanded federal rights in the data, designs and other intellectual property developed during Phase II (these expanded rights would be extinguished if the Alliance achieved financial close and took the program into Phase III); and (2) interim milestones and other safeguards that would allow DOE to suspend or terminate funding if the Alliance failed to make sufficient progress or schedule delays made it unlikely that the Alliance could prudently expend the ARRA funding before it expires on September 30, 2015. This amendment incorporates these conditions and requirements, as well as the changes resulting from DOE's conditional approval of the novation request and the decision to reduce the non-federal cost share.

**Description of Amendment 014:** DOE has conditionally approved the novation request and authorizes the Alliance to take this project and its sequestration project into Phase II subject to its satisfaction of a number of conditions by April 9, 2013. Accordingly, this reissued Cooperative Agreement:

1. Replaces Ameren Energy Resources Company, LLC, with the FutureGen Industrial Alliance, Inc. as the Recipient in Blocks 5 and 11 of the Assistance Agreement.
2. Reduces the non-federal cost share to 1 percent until all federal funds obligated to the Cooperative Agreement from ARRA appropriations are expended.
3. Incorporates changes to the Statement of Project Objectives (SOPO) as well as changes to the project, schedule and budget proposed by the Alliance.
4. Imposes a number of conditions that the Alliance must satisfy in order for the Cooperative Agreement to extend beyond April 9, 2013.
5. Identifies the Recipient as "high-risk" pursuant to 10 CFR 600.114 and DOE's Guide to Financial Assistance Section 2.5.4.
6. Establishes interim milestones and other safeguards that allow DOE to suspend or terminate funding during Phase II if the Alliance failed to make sufficient progress or schedule delays made it unlikely that the Alliance could prudently expend the ARRA funding before it expires on September 30, 2015.
7. Aligns the terminology used for Phase descriptions to be consistent between both FG 2.0 projects and the SOPO.

The conditions DOE imposes in this reissued Cooperative Agreement include:

1. Limits the activities the Alliance can perform during the definitization process of Phase IIa.
2. The Alliance and its partners (Air Liquide, Babcock and Wilcox, URS) must provide DOE with expanded rights in intellectual property, data, and technical information developed during Phase II. The rights will be expanded relative to the terms included in cooperative agreements DE-FE0005054 and DE-FE0001882 as

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<sup>1</sup> Ameren has agreed to continue providing assistance for permitting and maintenance of the power plant during Phase II.

issued in 2010. The expanded rights will not extend to background intellectual property or intellectual property created prior to Phase II, and would terminate if the Alliance achieves financial close and takes the FutureGen 2.0 program into Phase III.

As of the effective date of this Amendment, the Cooperative Agreement is as follows:

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## TERMS AND CONDITIONS

The Terms and Conditions contained herein are also referred to individually and collectively as “Articles”.

### 1. RESOLUTION OF CONFLICTING CONDITIONS

Any apparent inconsistency between Federal statutes and regulations and the terms and conditions contained in this award must be referred to the DOE Award Administrator for guidance.

### 2. AWARD AGREEMENT TERMS AND CONDITIONS

This award/agreement consists of the Assistance Agreement cover page, plus the following:

- a. Terms and Conditions.
- b. Attachments:

Attachment No.	Title
1	Intellectual Property Provisions
2	Statement of Project Objectives
3	Federal Assistance Reporting Checklist
4	Budget Pages
5	Department of Labor Wage Determination (reserved)
6	Cooperation and Technology Agreement (reserved)

- c. Applicable program regulations: None.
- d. DOE Assistance Regulations, 10 CFR 600 at <http://www.eCFR.gov>.
- e. If the award is for research and to a university or non-profit, the Research Terms & Conditions and the DOE Agency Specific Requirements at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>.
- f. Application/proposal as approved by DOE.
- g. National Policy Assurances to Be Incorporated as Award Terms in effect on date of award at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Award Terms.

### 3. AWARD PROJECT PERIOD AND PHASES/SUBPHASES

The Project Period for this award is 10/1/2010 through 2/28/2020 consisting of the following Phases.

	Start Date	End Date
Phase I – Project Definition, Pre-FEED	10/1/2010	02/04/2013
Phase II – National Environmental Policy Act (NEPA), Permitting, and Design	02/05/2013	06/15/2014
Subphase IIa	04/10/2013	04/09/2013
Subphase IIb	09/17/2013	09/16/2013
Subphase IIc	12/17/2013	12/16/2013
Subphase IId	04/01/2014	03/31/2014
Subphase IIe		06/16/2014
Phase III – Construction and Commissioning	06/16/2014	09/29/2017
Phase IV – Operations	09/30/2017	02/28/2020

### 4. PAYMENT PROCEDURES - REIMBURSEMENT THROUGH THE AUTOMATED CLEARING HOUSE (ACH) VENDER INQUIRY PAYMENT ELECTRONIC REPORTING SYSTEM (VIPERS)

- a. Method of Payment. Payment will be made by reimbursement through ACH.
- b. Requesting Reimbursement. Requests for reimbursements must be made electronically through Department of Energy's Oak Ridge Financial Service Center (ORFSC) VIPERS. To access and use VIPERS, you must enroll at <https://finweb.oro.doe.gov/vipers.htm>. Detailed instructions on how to enroll are provided on the web site.

For non-construction awards, you must submit a Standard Form (SF) 270, "Request for Advance or Reimbursement" at <https://finweb.oro.doe.gov/vipers.htm> and attach a file containing appropriate supporting documentation. The file attachment must show the total federal share claimed on the SF 270, the non-federal share claimed for the billing

period if cost sharing is required, and cumulative expenditures to date (both Federal and non-Federal) for each of the following categories: salaries/wages and fringe benefits; equipment; travel; Recipient/training support costs, if any; other direct costs, including subawards/contracts; and indirect costs. For construction awards, you must submit a SF 271, "Outlay Report and Request for Reimbursement for Construction Programs," through VIPERS.

c. Timing of submittals. Submittal of the SF 270 or SF 271 should coincide with your normal billing pattern, but not more frequently than every two weeks. Requests for reimbursement shall be made in accordance with the instructions contained on the SF 270 or SF 271.

d. Adjusting payment requests for available cash. You must disburse any funds that are available from repayments to and interest earned on a revolving fund, program income, rebates, refunds, contract settlements, audit recoveries, credits, discounts, and interest earned on any of those funds before requesting additional cash payments from DOE.

e. Payments. The DOE approving official will approve the invoice as soon as practicable but not later than 30 days after your request is received, unless the billing is improper. Upon receipt of an invoice payment authorization from the DOE approving official, the ORFSC will disburse payment to you. You may check the status of your payments at the VIPERS web site. All payments are made by electronic funds transfer to the bank account identified on the ACH Vendor/Miscellaneous Payment Enrollment Form (SF 3881) that you filed.

**5. COST SHARING**

All costs will be shared between DOE and the Recipient on an “as-expended”, dollar-for-dollar basis. In order to be recognized as allowable cost sharing, a cost must be otherwise allowable in accordance with the applicable Federal cost principles and DOE Regulations (10CFR600.123; 600.224; or 600.313) governing cost sharing. Cost sharing may be in various forms or combinations, which includes but is not limited to cash outlays and in-kind contributions. All allowable Project costs, whether cash or in-kind, shall be shared by DOE when such costs are incurred by applying the share ratios set forth in the Cooperative Agreement. The value of in-kind contributions not requiring cash outlays (e.g., existing assets) shall be pro-rated over the life of the Project, beginning when the in-kind contribution is initially required for performance of the Cooperative Agreement.

a. Total Estimated Project Cost is the sum of the Government share and Recipient share of the estimated Project costs. The Recipient’s cost share must come from non-Federal sources unless otherwise allowed by law. By accepting federal funds under this award, you agree that you are liable for your percentage share of total allowable Project costs, on a per Phase, “as expended”, dollar-for-dollar basis, even if the Project is terminated early or is not funded to its completion. This cost is shared as follows:

Phase No.	Government Share		Recipient Share		Total
	\$	%	\$	%	
I*	\$13,072,431	81.2%	\$3,035,321	18.8%	\$16,107,752
II**	\$99,766,951	99.0%	\$1,007,747	1.0%	\$100,774,698
II a	\$3,294,307	99.0%	\$33,276	1.0%	\$3,327,583
II b	TBD		TBD		TBD
II c	TBD		TBD		TBD
II d	TBD		TBD		TBD
II e	TBD		TBD		TBD
III***	\$476,904,618	44.5%	\$594,144,963	55.5%	\$1,071,049,581
IV***	\$0	0.0%	\$4,574,007	100.0%	\$4,574,007
<b>Total Project</b>	<b>\$589,744,000</b>	<b>49.5%</b>	<b>\$602,762,038</b>	<b>50.5%</b>	<b>\$1,192,506,038</b>

\*Cost for Phase I reflects adjustments resulting from Amendment 013.  
 \*\*Cost for Phase II is subject to the definitization process specified in the Article “Conditions on Award”  
 \*\*\*Costs for Phases III and IV are subject to review during the Decision Point Application process.

b. If you discover that you may be unable to provide cost sharing of at least the amount identified in paragraph a of this Article, you should immediately provide written notification to the DOE Award Administrator indicating whether you will continue or phase out the Project. If you plan to continue the Project, the notification must describe how replacement cost sharing will be secured.

c. You must maintain records of all Project costs that you claim as cost sharing, including in-kind costs, as well as records of costs to be paid by DOE. Such records are subject to audit.

d. Failure to provide the cost sharing required by this Article may result in the subsequent recovery by DOE of some or all the funds provided under the award.

e. The Government has agreed to reduce the non-federal cost share of Phase II from 20 percent to 1 percent because it is necessary for continuation of the FutureGen 2.0 program in light of the Recipient's inability to provide additional non-federal cost share. The Government intends to reimburse allowable project costs at a rate of 99 percent until all ARRA funds have been disbursed, after which the Alliance agrees to pay 100 percent of project costs. The Recipient agrees that it will be required in Phase III to "true-up" (i.e., repay DOE if the project terminates during Phase III an amount sufficient to ensure that the non-federal cost-share for Phase III is not less than 55.5 percent). The Recipient shall achieve an overall 50.5 percent non-federal cost share over the life of the project (Phase 1 through Phase 4). After DOE funds in the amount of \$589,744,000 have been disbursed to the Recipient, DOE has no further obligation to provide additional funding.

f. DOE intends to authorize carryover funding for the Recipient pending Recipient's demonstrated need of additional funding for completion of the Project.

## **6. REBUDGETING AND RECOVERY OF INDIRECT COSTS - REIMBURSABLE INDIRECT COSTS AND FRINGE BENEFITS**

a. If actual allowable indirect costs are less than those budgeted and funded under the award, you may use the difference to pay additional allowable direct costs during the Project period. If at the completion of the award the Government's share of total allowable costs (i.e., direct and indirect), is less than the total costs reimbursed, you must refund the difference.

b. Recipients are expected to manage their indirect costs. DOE will not amend an award solely to provide additional funds for changes in indirect cost rates. DOE recognizes that the inability to obtain full reimbursement for indirect costs means the recipient must absorb the underrecovery. Such underrecovery may be allocated as part of the organization's required cost sharing.

## **7. USE OF PROGRAM INCOME - COST SHARING**

If you earn program income during the Project period as a result of this award, you may use the program income to meet your cost sharing requirement.

## **8. STATEMENT OF FEDERAL STEWARDSHIP**

In light of the substantial federal cost share and the significant risks resulting from Ameren's decision not to proceed with this Project, DOE will exercise heightened Federal stewardship in overseeing the Project activities performed under this award. Stewardship activities include, but are not limited to, conducting site visits; reviewing performance and financial reports; providing technical assistance and/or temporary intervention in unusual circumstances to correct deficiencies which develop during the Project; participating in meetings with regulatory agencies and others, assuring compliance with terms and conditions; and reviewing technical performance after Project completion to ensure that the award objectives have been accomplished.

## **9. STATEMENT OF SUBSTANTIAL INVOLVEMENT**

In light of the substantial federal cost share and the significant risks resulting from Ameren's decision not to proceed with this Project, substantial involvement will be necessary between DOE and the Recipient during performance of this Cooperative Agreement. Pursuant to 10 CFR 600.5(b)&(d), DOE will share responsibility for the management, control, and direction of the Project, and has the right to intervene in the conduct and performance of project activities for programmatic reasons. DOE and Recipient will collaborate and share responsibility for the management of the Project as further described in this section.

## **RECIPIENT'S RESPONSIBILITIES.**

The Recipient shall be responsible for all aspects of Project performance as set forth in this Cooperative Agreement and the Statement of Project Objectives contained herein. The Recipient Principal Investigator shall serve as the Recipient's authorized representative for the technical elements of all work to be performed under this Cooperative Agreement. The Recipient Business Officer shall serve as the Recipient's authorized representative for administrative elements dealing with the Cooperative Agreement. Specific examples of the Recipient's responsibilities include:

- Performing the activities delineated in this Cooperative Agreement and associated Statement of Project Objectives in accordance with the Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services.
- Satisfactory performance and periodic status reporting of the activities in the SOPO. Phase II will be conducted as five (5) Subphases, each with a set of accomplishments<sup>2</sup> that the Recipient must achieve by the dates specified below. Once the Recipient has reported to DOE that the critical accomplishments for a Subphase have been accomplished on or before the dates specified below, it is authorized to proceed into the next Subphase.

**Subphase IIa – February 1, 2013-April 9, 2013**

- Successful satisfaction of the Conditions on Award specified within this Cooperative Agreement.

**Subphase IIb – April 10, 2013-September 16, 2013**

- Submission to DOE of Power Purchase Agreements signed by Ameren Illinois and ComEd
- Submission of CO<sub>2</sub> injection permit application to U.S. EPA
- Submission of pipeline permit application to Illinois Commerce Commission

**Subphase IIc – September 17, 2013-December 16, 2013**

- Completion of Front End Engineering Design (FEED) and submission to DOE
- Control of surface and subsurface rights required for 20-year CO<sub>2</sub> storage

**Subphase IIId – December 17, 2013-March 31, 2014**

- Submission to DOE of a definitive estimate of Project cost
- Issuance of a CO<sub>2</sub> injection permit by U.S. EPA
- Issuance of a final pipeline permit by Illinois Commerce Commission
- Issuance of non-appealable air and water permits
- Execution of Engineering Procurement and Construction (EPC), Operating & Management (O&M), and commodity contracts

**Subphase IIe – April 1, 2014-June 16, 2014**

- Achieve Financial Close
- Performing the activities delineated in this Cooperative Agreement and SOPO in accordance with the Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services.
- Managing and controlling Project activities in accordance with established processes and procedures to ensure tasks and subtasks are completed within the schedule and budget constraints defined by the current Project Management Plan.
- Notifying the DOE Project Officer and Contracting Officer in a timely manner of issues that arise during the course of the Project that jeopardize the technical, schedule or budget objectives.
- Implementing an approach to identify, analyze and respond to Project risks that is commensurate with the complexity of the Project.
- Defining and revising technical and managerial approaches and plans, (i.e. Test Plans) submitting the plans to

<sup>2</sup> It is understood that the Phase II Subphase accomplishments may be a responsibility of the other FutureGen 2.0 Cooperative Agreement (DE-FE0001882).

DOE for review and concurrence, and incorporating DOE comments.

- Coordinating Project activities with external organizations, including subrecipients, subcontractors, and consultants to ensure effective integration of all work elements.
- Attending annual program review meetings and reporting Project status.
- Submitting technical reports and incorporating DOE comments.
- Reporting per ARRA requirements as defined in paragraph d. of the Article entitled “REPORTING AND REGISTRATION REQUIREMENTS UNDER SECTION 1512 OF THE RECOVERY ACT”.
- Presenting the Project results at appropriate technical conferences or meetings as approved by the DOE Project Officer.
- Facilitating DOE inspection and/or evaluation of Project work on the premises of the Recipient or subrecipient, at all reasonable times and in a manner that will not unduly delay the work. The Recipient shall furnish and shall require subrecipients to furnish all reasonable facilities and assistance for the safe, efficient and convenient performance of these duties.
- Whenever the costs at the sub-subtask level (Level 5) are anticipated to deviate by more than \$50,000 from the budgeted costs, the Recipient shall notify DOE prior to incurring such costs. The Recipient shall involve DOE in the decision making process prior to incurring such costs. Additionally, the Recipient shall provide an explanation for this variance between the actual and budgeted costs.
- Assisting DOE with completion of the NEPA process in a timely manner by participating in the NEPA planning efforts, participating in the public participation activities under NEPA, providing Project planning and design information and analyses to support environmental impact evaluations, and assisting in gathering information for inclusion in the Environmental Impact Statement (EIS).
- Notifying DOE of important meetings, proceedings, and other events as soon as possible so that DOE can decide whether to participate.

## **DOE RESPONSIBILITIES**

DOE shall monitor the Recipient’s progress in performing the Project and shall have a substantial involvement in the management, control and direction of the Project. Specific examples of DOE responsibilities include:

- Confirm that the Recipient has achieved the specified Subphase accomplishments. In the event that the Recipient fails to achieve any Subphase accomplishment DOE will notify the Recipient and take appropriate action (which may include, among other things, including suspension and/or termination).
- Collaborating with the Recipient on Project plans to include project management, test, and technology transfer plans and making recommendation for alternate approaches if the plans do not address critical programmatic issues.
- Collaborating with the Recipient regarding technical progress and recommending alternate approaches or shifting work emphasis, if needed, to adequately address critical Project and programmatic issues.
- Conducting semiannual program review meetings to evaluate progress with respect to Project and program objectives.
- Participating in project management planning activities, including risk analysis, to ensure DOE’s program requirements or limitations are considered in performance of the work elements.
- Promoting and facilitating technology transfer activities, including disseminating Project results through presentations and publications.

- Serving as scientific/technical liaison between awardees and other program or industry staff.
- At DOE's discretion, physically inspecting and evaluating the work performed or being performed under the Cooperative Agreement, including associated documentation, and the premises where the work is being performed.
- Conducting and completing the NEPA process for the FutureGen 2.0 program.
- Reviewing and assessing performance to ensure that adequate progress is made within the current Phase of both FutureGen 2.0 Projects before deciding whether to authorize work on the next Phase pursuant to the terms and conditions in this Cooperative Agreement.
- Serving as an ex-officio member of all FutureGen Alliance technical committees and subcommittees funded as a direct cost under this agreement.

## 10. SITE VISITS

DOE's authorized representatives have the right to make site visits at reasonable times to review Project accomplishments and management control systems and to provide technical assistance, if required. You must provide, and must require your subawardees to provide, reasonable access to facilities, office space, resources, and assistance for the safety and convenience of the government representatives in the performance of their duties. All site visits and evaluations must be performed in a manner that does not unduly interfere with or delay the work.

## 11. REPORTING REQUIREMENTS

- a. Requirements. The reporting requirements for this award are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to this award. Failure to comply with these reporting requirements is considered a material noncompliance with the terms of the award. Noncompliance may result in withholding of future payments, suspension, or termination of the current award, and withholding of future awards. A willful failure to perform, a history of failure to perform, or unsatisfactory performance of this and/or other financial assistance awards, may also result in a debarment action to preclude future awards by Federal agencies.
- b. Dissemination of scientific/technical reports. Scientific/technical reports submitted under this award will be disseminated on the Internet via the DOE Information Bridge ([www.osti.gov/bridge](http://www.osti.gov/bridge)), unless the report contains patentable material, protected data, or SBIR/STTR data. Citations for journal Articles produced under the award will appear on the DOE Energy Citations Database ([www.osti.gov/energycitations](http://www.osti.gov/energycitations)).
- c. Restrictions. Reports submitted to the DOE Information Bridge must not contain any Protected Personal Identifiable Information (PII), limited rights data (proprietary data), classified information, information subject to export control classification, or other information not subject to release.

## 12. PUBLICATIONS

- a. You are encouraged to publish or otherwise make publicly available the results of the work conducted under the award.
- b. An acknowledgment of Federal support and a disclaimer must appear in the publication of any material, whether copyrighted or not, based on or developed under this Project, as follows:

Acknowledgment: "This material is based upon work supported by the Department of Energy Office of Fossil Energy under Award Number DE-FE0005054."

Disclaimer: "This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name,

trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

### **13. FEDERAL, STATE, AND MUNICIPAL REQUIREMENTS**

You must obtain any required permits and comply with applicable federal, state, and municipal laws, codes, and regulations for work performed under this award.

### **14. INTELLECTUAL PROPERTY PROVISIONS AND CONTACT INFORMATION**

a. The intellectual property provisions applicable to this award are provided as an attachment to this award or are referenced on the Agreement Face Page. A list of all intellectual property provisions may be found at <http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards>.

b. Questions regarding intellectual property matters should be referred to the DOE Award Administrator and the Patent Counsel designated as the service provider for the DOE office that issued the award. The IP Service Providers List is found at <http://energy.gov/gc/downloads/intellectual-property-ip-service-providers-acquisition-and-assistance-transactions>.

c. The Recipient acknowledges and agrees that as part of the definitization of this Cooperative Agreement, the Recipient, its sub-recipients, and other partners will be required to provide DOE with expanded rights in the intellectual property developed under this Agreement that are acceptable to DOE. The expanded rights would be extinguished should the Recipient achieve financial close and take the Project into Phase III.

### **15. NATIONAL SECURITY: CLASSIFIABLE RESULTS ORIGINATING UNDER AN AWARD**

a. This award is intended for unclassified, publicly releasable research. You will not be granted access to classified information. DOE does not expect that the results of the research Project will involve classified information. Under certain circumstances, however, a classification review of information originated under the award may be required. The Department may review research work generated under this award at any time to determine if it requires classification.

b. Executive Order 12958 (60 Fed. Reg. 19,825 (1995)) states that basic scientific research information not clearly related to the national security shall not be classified. Nevertheless, some information concerning (among other things) scientific, technological, or economic matters relating to national security or cryptology may require classification. If you originate information during the course of this award that you believe requires classification, you must promptly:

1. Notify the DOE Project Officer and the DOE Award Administrator;
2. Submit the information by registered mail directly to the Director, Office of Classification and Information Control, SO-10.2; U.S. Department of Energy; P.O. Box A; Germantown, MD 20875-0963, for classification review.
3. Restrict access to the information to the maximum extent possible until you are informed that the information is not classified, but no longer than 30 days after receipt by the Director, Office of Classification and Information Control.

c. If you originate information concerning the production or utilization of special nuclear material (i.e., plutonium, uranium enriched in the isotope 233 or 235, and any other material so determined under section 51 of the Atomic Energy Act) or nuclear energy, you must:

1. Notify the DOE Project Officer and the DOE Award Administrator;
2. Submit the information by registered mail directly to the Director, Office of Classification and Information Control, SO-10.2; U.S. Department of Energy; P. O. Box A; Germantown, MD 20875-0963 for classification review within 180 days of the date the recipient first discovers or first has reason to believe that the

information is useful in such production or utilization; and

3. Restrict access to the information to the maximum extent possible until you are informed that the information is not classified, but no longer than 90 days after receipt by the Director, Office of Classification and Information Control.

d. If DOE determines any of the information requires classification, you agree that the Government may terminate the award by mutual agreement in accordance with 10 CFR 600.25(d). All material deemed to be classified must be forwarded to the DOE, in a manner specified by DOE.

e. If DOE does not respond within the specified time periods, you are under no further obligation to restrict access to the information.

## **16. LOBBYING RESTRICTIONS**

By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence officials of any government on any legislation, law, ratification, policy or appropriation matters pending before such officials, other than to communicate with such officials as described in 18 U.S.C. 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

## **17. NOTICE REGARDING THE PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS -- SENSE OF CONGRESS**

It is the sense of the Congress that, to the greatest extent practicable, all equipment and products purchased with funds made available under this award should be American-made.

## **18. FUNDING OF PHASES**

DOE has obligated \$589,744,000 for completion of the Project funded by this Cooperative Agreement; however, only \$112,839,382 is available for work performed by the Recipient during Phases I and II of the Project. For Phases III through IV, the remainder (\$476,904,618) would be available contingent upon (1) availability of funds appropriated by Congress for the purpose of this program; (2) the availability of future-year budget authority; (3) satisfactory and timely completion of the tasks required; (4) submittal of required reports; (5) compliance with the terms and conditions of the award; (6) the submission by the Recipient of a complete and acceptable Decision Point Application; and (7) written approval of the Decision Point Application by the DOE Contracting Officer.

In the event that the Recipient does not submit a continuation application for subsequent Phases or DOE disapproves a Decision Point Application for subsequent Phases, the maximum DOE liability to the Recipient is the funds that are available for the current approved Phase(s). In such event, DOE reserves the right to deobligate any remaining funds.

## **19. INSOLVENCY, BANKRUPTCY OR RECEIVERSHIP**

a. You shall immediately notify the DOE of the occurrence of any of the following events: (i) you or your parent's filing of a voluntary case seeking liquidation or reorganization under the Bankruptcy Act; (ii) your consent to the institution of an involuntary case under the Bankruptcy Act against you or your parent; (iii) the filing of any similar proceeding for or against you or your parent, or its consent to, the dissolution, winding-up or readjustment of your debts, appointment of a receiver, conservator, trustee, or other officer with similar powers over you, under any other applicable state or federal law; or (iv) your insolvency due to your inability to pay your debts generally as they become due.

b. Such notification shall be in writing and shall: (i) specifically set out the details of the occurrence of an event referenced in paragraph a; (ii) provide the facts surrounding that event; and (iii) provide the impact such event will have on the Project being funded by this award.

c. Upon the occurrence of any of the four events described in the first paragraph, DOE reserves the right to conduct a review of your award to determine your compliance with the required elements of the award (including such items as cost share, progress towards technical Project objectives, and submission of required reports). If the DOE review

determines that there are significant deficiencies or concerns with your performance under the award, DOE reserves the right to impose additional requirements, as needed, including (i) change your payment method; or (ii) institute payment controls.

d. Failure of the Recipient to comply with this provision may be considered a material noncompliance of this financial assistance award by the Contracting Officer.

## **20. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REQUIREMENTS**

Recipient is restricted from taking any action using Federal funds that would have an adverse effect on the environment or limit the choice of reasonable alternatives prior to DOE issuing a Record of Decision (ROD). Prohibited actions include, but are not limited to, demolition/decontamination of existing buildings, site preparation/clearing, ground breaking, excavation/construction, and detailed design. This restriction also prohibits the purchasing of any long lead-time equipment using federal funds until a ROD is issued. However, activities necessary to perform site characterization/sampling/monitoring; preparation of conceptual design data/analysis/documentation to include Project planning assistance/training, may be performed before a ROD is issued.

Prior to the issuance of a ROD, DOE agrees to discuss with the Recipient any proposed conditions and requirements that may be included in it (or in a mitigation action plan (MAP) issued pursuant to a ROD) if DOE decides to proceed with its proposed action. However, DOE retains sole discretion on whether to issue a ROD and what conditions and requirements to include in it or in a MAP if one is issued.

If DOE decides to proceed with its proposed action subject to conditions, limitations, mitigation requirements, or monitoring requirements specified in a ROD, MAP, or both, the Recipient agrees to:

- a) abide by the conditions, limitations, mitigation requirements, and monitoring requirements specified in the ROD or MAP;
- b) negotiate changes to the Project schedule, costs, and/or scope as necessary to effect the requirements or conditions in the ROD or MAP;
- c) allow DOE's authorized representatives to visit the site and facilities upon notice to verify Project status and compliance to include conditions and requirements in the ROD or MAP; and
- d) submit data or otherwise meet specified reporting requirements that may be in the ROD or MAP.

If the Recipient finds the conditions and requirements to be unacceptable, the Recipient reserves the right to terminate the award in accordance with 10 CFR 600.161(a)(3), 244(b), 351(a)(3), as applicable.

DOE and the Recipient will coordinate the NEPA review of the FutureGen 2.0 program with the environmental review conducted under applicable Illinois statutes and regulations by appropriate Illinois agencies, including but not limited to the Illinois Environmental Protection Agency, the Illinois Department of Natural Resources, and the Illinois Historic Preservation Agency, in order to ensure an expedited and efficient federal and state review of potential environmental impacts.

## **21. SPECIAL PROVISIONS RELATING TO WORK FUNDED UNDER AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (Mar 2009)**

### Preamble

The American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act) was enacted to preserve and create jobs and promote economic recovery, assist those most impacted by the recession, provide investments needed to increase economic efficiency by spurring technological advances in science and health, invest in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits, stabilize State and local government budgets, in order to minimize and avoid reductions in essential services and counterproductive State and local tax increases. Recipients shall use grant funds in a manner that maximizes job

creation and economic benefit.

The Recipient shall comply with all terms and conditions in the Recovery Act relating generally to governance, accountability, transparency, data collection and resources as specified in Act itself and as discussed below.

Recipients should begin planning activities for their first tier subrecipients, including obtaining a DUNS number (or updating the existing DUNS record), and registering with the Central Contractor Registration (CCR).

Be advised that Recovery Act funds can be used in conjunction with other funding as necessary to complete projects, but tracking and reporting must be separate to meet the reporting requirements of the Recovery Act and related guidance. For projects funded by sources other than the Recovery Act, Contractors must keep separate records for Recovery Act funds and to ensure those records comply with the requirements of the Act.

The Government has not fully developed the implementing instructions of the Recovery Act, particularly concerning specific procedural requirements for the new reporting requirements. The Recipient will be provided these details as they become available. The Recipient must comply with all requirements of the Act. If the recipient believes there is any inconsistency between ARRA requirements and current award terms and conditions, the issues will be referred to the Contracting Officer for reconciliation.

#### Definitions

For purposes of this clause, Covered Funds means funds expended or obligated from appropriations under the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5. Covered Funds will have special accounting codes and will be identified as Recovery Act funds in the grant, cooperative agreement or TIA and/or modification using Recovery Act funds. Covered Funds must be reimbursed by September 30, 2015.

Non-Federal employer means any employer with respect to covered funds – the contractor, subcontractor, grantee, or recipient, as the case may be, if the contractor, subcontractor, grantee, or recipient is an employer; and any professional membership organization, certification of other professional body, any agent or licensee of the Federal government, or any person acting directly or indirectly in the interest of an employer receiving covered funds; or with respect to covered funds received by a State or local government, the State or local government receiving the funds and any contractor or subcontractor receiving the funds and any contractor or subcontractor of the State or local government; and does not mean any department, agency, or other entity of the federal government.

Recipient means any entity that receives Recovery Act funds directly from the Federal government (including Recovery Act funds received through grant, loan, or contract) other than an individual and includes a State that receives Recovery Act Funds.

#### Special Provisions

##### A. Flow Down Requirement

Recipients must include these special terms and conditions in any subaward.

##### B. Segregation of Costs

Recipients must segregate the obligations and expenditures related to funding under the Recovery Act. Financial and accounting systems should be revised as necessary to segregate, track and maintain these funds apart and separate from other revenue streams. No part of the funds from the Recovery Act shall be commingled with any other funds or used for a purpose other than that of making payments for costs allowable for Recovery Act projects.

##### C. Prohibition on Use of Funds

None of the funds provided under this agreement derived from the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, may be used by any State or local government, or any private entity, for any casino or other gambling establishment, aquarium, zoo, golf course, or swimming pool.

##### D. Access to Records

With respect to each financial assistance agreement awarded utilizing at least some of the funds appropriated or otherwise made available by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, any representative of an appropriate inspector general appointed under section 3 or 8G of the Inspector General Act of 1988 (5 U.S.C. App.) or of the Comptroller General is authorized –

- (1) to examine any records of the contractor or grantee, any of its subcontractors or subgrantees, or any State or local agency administering such contract that pertain to, and involve transactions that relate to, the subcontract, subcontract, grant, or subgrant; and
- (2) to interview any officer or employee of the contractor, grantee, subgrantee, or agency regarding such transactions.

#### E. Publication

An application may contain technical data and other data, including trade secrets and/or privileged or confidential information, which the applicant does not want disclosed to the public or used by the Government for any purpose other than the application. To protect such data, the applicant should specifically identify each page including each line or paragraph thereof containing the data to be protected and mark the cover sheet of the application with the following Notice as well as referring to the Notice on each page to which the Notice applies:

##### Notice of Restriction on Disclosure and Use of Data

The data contained in pages ---- of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data here to the extent provided in the award. This restriction does not limit the Government's right to use or disclose data obtained without restriction from any source, including the applicant.

Information about this agreement will be published on the Internet and linked to the website [www.recovery.gov](http://www.recovery.gov), maintained by the Accountability and Transparency Board. The Board may exclude posting contractual or other information on the website on a case-by-case basis when necessary to protect national security or to protect information that is not subject to disclosure under sections 552 and 552a of title 5, United States Code.

#### F. Protecting State and Local Government and Contractor Whistleblowers.

The requirements of Section 1553 of the Act are summarized below. They include, but are not limited to:

**Prohibition on Reprisals:** An employee of any non-Federal employer receiving covered funds under the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, may not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing, including a disclosure made in the ordinary course of an employee's duties, to the Accountability and Transparency Board, an inspector general, the Comptroller General, a member of Congress, a State or Federal regulatory or law enforcement agency, a person with supervisory authority over the employee (or other person working for the employer who has the authority to investigate, discover or terminate misconduct), a court or grand jury, the head of a Federal agency, or their representatives information that the employee believes is evidence of:

- gross mis-management of an agency contract or grant relating to covered funds;
- a gross waste of covered funds;
- a substantial and specific danger to public health or safety related to the implementation or use of covered funds;
- an abuse of authority related to the implementation or use of covered funds; or
- as violation of law, rule, or regulation related to an agency contract (including the competition for or negotiation of a contract) or grant, awarded or issued relating to covered funds.

**Agency Action:** Not later than 30 days after receiving an inspector general report of an alleged reprisal, the head of the agency shall determine whether there is sufficient basis to conclude that the non-Federal employer has subjected the employee to a prohibited reprisal. The agency shall either issue an order denying relief in whole or in part or shall take one or more of the following actions:

- Order the employer to take affirmative action to abate the reprisal.
- Order the employer to reinstate the person to the position that the person held before the reprisal, together

with compensation including back pay, compensatory damages, employment benefits, and other terms and conditions of employment that would apply to the person in that position if the reprisal had not been taken.

- Order the employer to pay the employee an amount equal to the aggregate amount of all costs and expenses (including attorneys' fees and expert witnesses' fees) that were reasonably incurred by the employee for or in connection with, bringing the complaint regarding the reprisal, as determined by the head of a court of competent jurisdiction.

Nonenforceability of Certain Provisions Waiving Rights and Remedies or Requiring Arbitration: Except as provided in a collective bargaining agreement, the rights and remedies provided to aggrieved employees by this section may not be waived by any agreement, policy, form, or condition of employment, including any predispute arbitration agreement. No predispute arbitration agreement shall be valid or enforceable if it requires arbitration of a dispute arising out of this section.

Requirement to Post Notice of Rights and Remedies: Any employer receiving covered funds under the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, shall post notice of the rights and remedies as required therein. (Refer to section 1553 of the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, [www.Recovery.gov](http://www.Recovery.gov), for specific requirements of this section and prescribed language for the notices.)

#### G. Reserved

#### H. False Claims Act

Recipient and sub-recipients shall promptly refer to the DOE or other appropriate Inspector General any credible evidence that a principal, employee, agent, contractor, sub-grantee, subcontractor or other person has submitted a false claim under the False Claims Act or has committed a criminal or civil violation of laws pertaining to fraud, conflict of interest, bribery, gratuity or similar misconduct involving those funds.

#### I. Information in Support of Recovery Act Reporting

Recipient may be required to submit backup documentation for expenditures of funds under the Recovery Act including such items as timecards and invoices. Recipient shall provide copies of backup documentation at the request of the Contracting Officer or designee.

#### J. Availability of Funds

Funds appropriated under the Recovery Act and obligated to this award are available for reimbursement of costs until September 30, 2015.

## **22. REPORTING AND REGISTRATION REQUIREMENTS UNDER SECTION 1512 OF THE RECOVERY ACT**

- (a) This award requires the recipient to complete projects or activities which are funded under the American Recovery and Reinvestment Act of 2009 (Recovery Act) and to report on use of Recovery Act funds provided through this award. Information from these reports will be made available to the public.
- (b) The reports are due no later than ten calendar days after each calendar quarter in which the recipient receives the assistance award funded in whole or in part by the Recovery Act.
- (c) Recipients and their first-tier recipients must maintain current registrations in the Central Contractor Registration (<http://www.ccr.gov>) at all times during which they have active federal awards funded with Recovery Act funds. A Dun and Bradstreet Data Universal Numbering System (DUNS) Number (<http://www.dnb.com>) is one of the requirements for registration in the Central Contractor Registration.
- (d) The recipient shall report the information described in section 1512(c) of the Recovery Act using the reporting instructions and data elements that will be provided online at <http://www.FederalReporting.gov> and ensure that any information that is pre-filled is corrected or updated as needed.

NOTE to clause entitled "REQUIRED USE OF AMERICAN IRON, STEEL, AND MANUFACTURED GOODS

(COVERED UNDER INTERNATIONAL AGREEMENTS)—SECTION 1605 OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009": The Project funded under this DOE Cooperative Agreement numbered DE-FE0005054 does not involve the construction, alteration, maintenance or repair of a "public building" or "public work" as defined within the following clause and at 2 CFR Section 176.140(a)(2); therefore, the requirements of Section 1605 of the American Recovery and Reinvestment Act of 2009 and the following clause do not apply. In the event the Project changes to involve such activities, the following clause will apply to the construction, alteration, maintenance or repair of the "public building" or "public work".

**23. REQUIRED USE OF AMERICAN IRON, STEEL, AND MANUFACTURED GOODS (COVERED UNDER INTERNATIONAL AGREEMENTS)--SECTION 1605 OF THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009**

(a) Definitions. As used in this award term and condition--

*Designated country* —

- (1) A World Trade Organization Government Procurement Agreement country (Aruba, Austria, Belgium, Bulgaria, Canada, Chinese Taipei (Taiwan), Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea (Republic of), Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and United Kingdom;
- (2) A Free Trade Agreement (FTA) country (Australia, Bahrain, Canada, Chile, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Israel, Mexico, Morocco, Nicaragua, Oman, Peru, or Singapore);
- (3) A United States-European Communities Exchange of Letters (May 15, 1995) country: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and United Kingdom; or
- (4) An Agreement between Canada and the United States of America on Government Procurement country (Canada).

*Designated country iron, steel, and/or manufactured goods* —

- (1) Is wholly the growth, product, or manufacture of a designated country; or
- (2) In the case of a manufactured good that consist in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different manufactured good distinct from the materials from which it was transformed.

*Domestic iron, steel, and/or manufactured good* —

- (1) Is wholly the growth, product, or manufacture of the United States; or
- (2) In the case of a manufactured good that consists in whole or in part of materials from another country, has been substantially transformed in the United States into a new and different manufactured good distinct from the materials from which it was transformed. There is no requirement with regard to the origin of components or subcomponents in manufactured goods or products, as long as the manufacture of the goods occurs in the United States.

*Foreign iron, steel, and/or manufactured good* means iron, steel and/or manufactured good that is not domestic or designated country iron, steel, and/or manufactured good.

*Manufactured good* means a good brought to the construction site for incorporation into the building or work that has been--

- (1) Processed into a specific form and shape; or

(2) Combined with other raw material to create a material that has different properties than the properties of the individual raw materials.

*Public building and public work* means a public building of, and a public work of, a governmental entity (the United States; the District of Columbia; commonwealths, territories, and minor outlying islands of the United States; State and local governments; and multi-State, regional, or interstate entities which have governmental functions). These buildings and works may include, without limitation, bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, pumping stations, heavy generators, railways, airports, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, and canals, and the construction, alteration, maintenance, or repair of such buildings and works.

*Steel* means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements.

(b) *Iron, steel, and manufactured goods.*

(1) The award term and condition described in this section implements—

(i) Section 1605(a) of the American Recovery and Reinvestment Act of 2009 (Pub. L. 111—5) (Recovery Act), by requiring that all iron, steel, and manufactured goods used in the Project are produced in the United States; and

(ii) Section 1605(d), which requires application of the Buy American requirement in a manner consistent with U.S. obligations under international agreements. The restrictions of section 1605 of the Recovery Act do not apply to designated country iron, steel, and/or manufactured goods. The Buy American requirement in section 1605 shall not be applied where the iron, steel or manufactured goods used in the Project are from a Party to an international agreement that obligates the recipient to treat the goods and services of that Party the same as domestic goods and services. As of January 1, 2010, this obligation shall only apply to projects with an estimated value of \$7,804,000 or more.

(2) The recipient shall use only domestic or designated country iron, steel, and manufactured goods in performing the work funded in whole or part with this award, except as provided in paragraphs (b)(3) and (b)(4) of this section.

(3) The requirement in paragraph (b)(2) of this section does not apply to the iron, steel, and manufactured goods listed by the Federal Government as follows: none.

(4) The award official may add other iron, steel, and manufactured goods to the list in paragraph (b)(3) of this section if the Federal Government determines that--

(i) The cost of domestic iron, steel, and/or manufactured goods would be unreasonable. The cost of domestic iron, steel, and/or manufactured goods used in the Project is unreasonable when the cumulative cost of such material will increase the overall cost of the Project by more than 25 percent;

(ii) The iron, steel, and/or manufactured good is not produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality; or

(iii) The application of the restriction of section 1605 of the Recovery Act would be inconsistent with the public interest.

(c) Request for determination of inapplicability of section 1605 of the Recovery Act or the Buy American Act. (1)(i) Any recipient request to use foreign iron, steel, and/or manufactured goods in accordance with paragraph (b)(4) of this section shall include adequate information for Federal Government evaluation of the request, including--

(A) A description of the foreign and domestic iron, steel, and/or manufactured goods;

(B) Unit of measure;

(C) Quantity;

(D) Cost;

(E) Time of delivery or availability;

(F) Location of the Project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign iron, steel, and/or manufactured goods cited in accordance with paragraph (b)(4) of this section.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed cost comparison table in the format in paragraph (d) of this section.

(iii) The cost of iron, steel, or manufactured goods shall include all delivery costs to the construction site and any applicable duty.

(iv) Any recipient request for a determination submitted after Recovery Act funds have been obligated for a Project for construction, alteration, maintenance, or repair shall explain why the recipient could not reasonably foresee the need for such determination and could not have requested the determination before the funds were obligated. If the recipient does not submit a satisfactory explanation, the award official need not make a determination.

(2) If the Federal Government determines after funds have been obligated for a Project for construction, alteration, maintenance, or repair that an exception to section 1605 of the Recovery Act applies, the award official will amend the award to allow use of the foreign iron, steel, and/or relevant manufactured goods. When the basis for the exception is nonavailability or public interest, the amended award shall reflect adjustment of the award amount, redistribution of budgeted funds, and/or other appropriate actions taken to cover costs associated with acquiring or using the foreign iron, steel, and/or relevant manufactured goods.. When the basis for the exception is the unreasonable cost of the domestic iron, steel, or manufactured goods, the award official shall adjust the award amount or redistribute budgeted funds, as appropriate, by at least the differential established in 2 CFR 176.110(a).

(3) Unless the Federal Government determines that an exception to section 1605 of the Recovery Act applies, use of foreign iron, steel, and/or manufactured goods other than designated country iron, steel, and/or manufactured goods is noncompliant with the applicable Act.

(d) Data. To permit evaluation of requests under paragraph (b) of this section based on unreasonable cost, the applicant shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Items Cost Comparison

Description	Unit of measure	Quantity	Cost (dollars)*
Item 1:			
Foreign steel, iron, or manufactured good	_____	_____	_____
Domestic steel, iron, or manufactured good	_____	_____	_____
Item 2:			
Foreign steel, iron, or manufactured good	_____	_____	_____
Domestic steel, iron, or manufactured good	_____	_____	_____

[List name, address, telephone number, email address, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]

[Include other applicable supporting information.]

[\*Include all delivery costs to the construction site.]

**24. WAGE RATE REQUIREMENTS UNDER SECTION 1606 OF THE RECOVERY ACT**

(a) Section 1606 of the Recovery Act requires that all laborers and mechanics employed by contractors and

subcontractors on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to the Recovery Act shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code.

Pursuant to Reorganization Plan No. 14 and the Copeland Act, 40 U.S.C. 3145, the Department of Labor has issued regulations at 29 CFR parts 1, 3, and 5 to implement the Davis-Bacon and related Acts. Regulations in 29 CFR 5.5 instruct agencies concerning application of the standard Davis-Bacon contract clauses set forth in that section. Federal agencies providing grants, cooperative agreements, and loans under the Recovery Act shall ensure that the standard Davis-Bacon contract clauses found in 29 CFR 5.5(a) are incorporated in any resultant covered contracts that are in excess of \$2,000 for construction, alteration or repair (including painting and decorating).

(b) For additional guidance on the wage rate requirements of section 1606, contact your awarding agency. Recipients of grants, cooperative agreements and loans should direct their initial inquiries concerning the application of Davis-Bacon requirements to a particular federally assisted project to the Federal agency funding the project. The Secretary of Labor retains final coverage authority under Reorganization Plan Number 14.

## **25. RECOVERY ACT TRANSACTIONS LISTED IN SCHEDULE OF EXPENDITURES OF FEDERAL AWARDS AND RECIPIENT RESPONSIBILITIES FOR INFORMING SUBRECIPIENTS**

(a) To maximize the transparency and accountability of funds authorized under the American Recovery and Reinvestment Act of 2009 (Pub. L. 111-5) (Recovery Act) as required by Congress and in accordance with 2 CFR 215.21 “Uniform Administrative Requirements for Grants and Agreements” and OMB Circular A-102 Common Rules provisions, recipients agree to maintain records that identify adequately the source and application of Recovery Act funds. OMB Circular A-102 is available at <http://www.whitehouse.gov/omb/circulars/a102/a102.html>

(b) For recipients covered by the Single Audit Act Amendments of 1996 and OMB Circular A-133, “Audits of States, Local Governments, and Non-Profit Organizations,” recipients agree to separately identify the expenditures for Federal awards under the Recovery Act on the Schedule of Expenditures of Federal Awards (SEFA) and the Data Collection Form (SF-SAC) required by OMB Circular A-133. OMB Circular A-133 is available at <http://www.whitehouse.gov/omb/circulars/a133/a133.html>. This shall be accomplished by identifying expenditures for Federal awards made under the Recovery Act separately on the SEFA, and as separate rows under Item 9 of Part III on the SF-SAC by CFDA number, and inclusion of the prefix “ARRA-” in identifying the name of the Federal program on the SEFA and as the first characters in Item 9d of Part III on the SF-SAC.

(c) Recipients agree to separately identify to each subrecipient, and document at the time of subaward and at the time of disbursement of funds, the Federal award number, CFDA number, and amount of Recovery Act funds. When a recipient awards Recovery Act funds for an existing program, the information furnished to subrecipients shall distinguish the subawards of incremental Recovery Act funds from regular subawards under the existing program.

(d) Recipients agree to require their subrecipients to include on their SEFA information to specifically identify Recovery Act funding similar to the requirements for the recipient SEFA described above. This information is needed to allow the recipient to properly monitor subrecipient expenditure of ARRA funds as well as oversight by the Federal awarding agencies, Offices of Inspector General and the Government Accountability Office.

## **26. DAVIS BACON ACT AND CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

**Definitions:** For purposes of this Article, Davis Bacon Act and Contract Work Hours and Safety Standards Act, the following definitions are applicable:

(1) “Award” means any grant, cooperative agreement or technology investment agreement made with Recovery Act funds by the Department of Energy (DOE) to a Recipient. Such Award must require compliance with the labor standards clauses and wage rate requirements of the Davis-Bacon Act (DBA) for work performed by all laborers and mechanics employed by Recipients (other than a unit of State or local government whose own employees perform the construction) Subrecipients, Contractors and subcontractors.

(2) “Contractor” means an entity that enters into a Contract. For purposes of these clauses, Contractor shall include

(as applicable) prime contractors, Recipients, Subrecipients, and Recipients' or Subrecipients' contractors, subcontractors, and lower-tier subcontractors. "Contractor" does not mean a unit of State or local government where construction is performed by its own employees."

(3) "Contract" means a contract executed by a Recipient, Subrecipient, prime contractor or any tier subcontractor for construction, alteration, or repair. It may also mean (as applicable) (i) financial assistance instruments such as grants, cooperative agreements, technology investment agreements, and loans; and, (ii) Sub awards, contracts and subcontracts issued under financial assistance agreements. "Contract" does not mean a financial assistance instrument with a unit of State or local government where construction is performed by its own employees.

(4) "Contracting Officer" means the DOE official authorized to execute an Award on behalf of DOE and who is responsible for the business management and non-program aspects of the financial assistance process.

(5) "Recipient" means any entity other than an individual that receives an Award of Federal funds in the form of a grant, cooperative agreement or technology investment agreement directly from the Federal Government and is financially accountable for the use of any DOE funds or property, and is legally responsible for carrying out the terms and conditions of the program and Award.

(6) "Subaward" means an award of financial assistance in the form of money, or property in lieu of money, made under an award by a Recipient to an eligible Subrecipient or by a Subrecipient to a lower-tier subrecipient. The term includes financial assistance when provided by any legal agreement, even if the agreement is called a contract, but does not include the Recipient's procurement of goods and services to carry out the program nor does it include any form of assistance which is excluded from the definition of "Award" above.

(7) "Subrecipient" means a non-Federal entity that expends Federal funds received from a Recipient to carry out a Federal program, but does not include an individual that is a beneficiary of such a program.

**(a) Davis Bacon Act**

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the Project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3) ), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which will be attached to this agreement at a later date, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The Contracting Officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the Contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this Contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The Department of Energy or the Recipient or Subrecipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this Contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the Contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the Project), all or part of the wages required by the Contract, the Department of Energy, Recipient, or Subrecipient, may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the Project). Such records shall contain the name, address, and social security number of each such worker, his or

her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii) (A) The Contractor shall submit weekly for each week in which any Contract work is performed a copy of all payrolls to the Department of Energy if the agency is a party to the Contract, but if the agency is not such a party, the Contractor will submit the payrolls to the Recipient or Subrecipient (as applicable), applicant, sponsor, or owner, as the case may be, for transmission to the Department of Energy. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Department of Energy if the agency is a party to the Contract, but if the agency is not such a party, the Contractor will submit them to the Recipient or Subrecipient (as applicable), applicant, sponsor, or owner, as the case may be, for transmission to the Department of Energy, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the Recipient or Subrecipient (as applicable), applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the Contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the Contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 3729 of title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Department of Energy or the

Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a Project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29

CFR part 30.

(5) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this Contract.

(6) Contracts and Subcontracts. The Recipient, Subrecipient, the Recipient's and Subrecipient's contractors and subcontractor shall insert in any Contracts the clauses contained herein in(a)(1) through (10) and such other clauses as the Department of Energy may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The Recipient shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of the paragraphs in this clause.

(7) Contract termination: debarment. A breach of the Contract clauses in 29 CFR 5.5 may be grounds for termination of the Contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this Contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Recipient, Subrecipient, the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this Contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this Contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

**(b) Contract Work Hours and Safety Standards Act.** As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No Contractor or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The Department of Energy or the Recipient or Subrecipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same prime Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same

prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Contracts and Subcontracts. The Recipient, Subrecipient, and Recipient's and Subrecipient's contractor or subcontractor shall insert in any Contracts, the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The Recipient shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(5) The Contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract for all laborers and mechanics, including guards and watchmen, working on the Contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records to be maintained under this paragraph shall be made available by the Contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the Department of Energy and the Department of Labor, and the Contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

## **27. RECIPIENT FUNCTIONS**

- (1) On behalf of the Department of Energy (DOE), Recipient shall perform the following functions:
  - (a) Obtain, maintain, and monitor all DBA certified payroll records submitted by the Subrecipients and Contractors at any tier under this Award;
  - (b) Review all DBA certified payroll records for compliance with DBA requirements, including applicable DOL wage determinations;
  - (c) Notify DOE of any non-compliance with DBA requirements by Subrecipients or Contractors at any tier, including any non-compliances identified as the result of reviews performed pursuant to paragraph (b) above;
  - (d) Address any Subrecipient and any Contractor DBA non-compliance issues; if DBA non-compliance issues cannot be resolved in a timely manner, forward complaints, summary of investigations and all relevant information to DOE;
  - (e) Provide DOE with detailed information regarding the resolution of any DBA non-compliance issues;
  - (f) Perform services in support of DOE investigations of complaints filed regarding noncompliance by Subrecipients and Contractors with DBA requirements;
  - (g) Perform audit services as necessary to ensure compliance by Subrecipients and Contractors with DBA requirements and as requested by the Contracting Officer; and
  - (h) Provide copies of all records upon request by DOE or DOL in a timely manner.
- (2) All records maintained on behalf of the DOE in accordance with paragraph (1) above are federal government (DOE) owned records. DOE or an authorized representative shall be granted access to the records at all times.
- (3) In the event of, and in response to any Freedom of Information Act, 5 U.S.C. 552, requests submitted to DOE, Recipient shall provide such records to DOE within 5 business days of receipt of a request from DOE.

## **28. FINAL INCURRED COST AUDIT**

In accordance with 10 CFR 600, DOE reserves the right to initiate a final incurred cost audit on this award. If the audit has not been performed or completed prior to the closeout of the award, DOE retains the right to recover an appropriate amount after fully considering the recommendations on disallowed costs resulting from the final audit.

## **NETL SPECIAL TERMS AND CONDITIONS**

## **29. DEFINITIONS**

- a. Project: FutureGen 2.0 – Oxy-combustion Large Scale Test
- b. Project Site: All areas within Ameren’s Meredosia Energy Center or elsewhere necessary to the completion and operation of the Project, including, but not limited to, Unit 4 of the Meredosia Energy Center.

### 30. POWER PLANT PROJECT ASSETS

a. The former recipient, Ameren, will continue to own the assets needed for the project during Phase II. Ameren and the Recipient have entered into two separate agreements pursuant to which: (1) Ameren would maintain the assets (Retrofit-Ready Cost Agreement) in a condition suitable for continuation of the Project; and (2) the Recipient would have the option to purchase the assets (Asset Purchase Agreement) for [REDACTED] if it achieves financial close and continues the Project into Phase III. However, the Asset Purchase Agreement can be terminated if, among other things: (1) the environmental liabilities (to be determined during Phase II) exceed [REDACTED] (referred to as Ameren Remediation Cap); (2) either Ameren or the Recipient is determined to be in breach of the Asset Purchase Agreement; or (3) by mutual consent of Ameren and the Recipient. The Asset Purchase Agreement allows Ameren to transfer the assets to a third party before the Recipient exercises its option to purchase them. The Asset Purchase Agreement purports to require any third party to which Project assets are transferred to comply with Ameren’s obligations regarding sale of Project assets to the Recipient.

b. The Recipient must immediately notify DOE if it becomes aware of one or more of the following: (1) Ameren intends to transfer any of the assets needed for the Project to a third party; (2) Ameren’s remediation obligation (as defined in the Asset Purchase Agreement) has or appears likely to exceed the Ameren Remediation Cap; (3) any allegation that the Recipient or Ameren is in breach of the Asset Purchase Agreement or the Retrofit-Ready Cost Agreement; or (4) any event that calls into question the Recipient’s or Ameren’s ability or willingness to transfer the Project assets to the Recipient pursuant to the terms of the Asset Purchase Agreement.

### 31. FURTHER ASSURANCES

The Parties have agreed that prior to DOE authorizing the Recipient to take the Project into Phase III, an appropriate provision will be included in this Cooperative Agreement that provides DOE with an appropriate remedy if Recipient were to fail to perform the long-term test requirements specified in the Statement of Project Objectives for Phase IV. The Parties agree that such a provision would apply only if: (i) the Project was not terminated before completion; (ii) DOE has fulfilled its cost sharing obligations under this Cooperative Agreement; and (iii) Recipient has completed the Project and the Project is authorized to and capable of performing the long-term test requirements specified in the Statement of Project Objectives for Phase IV. The Parties also agree that such a provision will specify appropriate force majeure events that would temporarily or permanently excuse the Recipient from performing the long-term test requirements, including without limitation, failures due to circumstances outside Recipient’s control.

### 32. SUBRECIPIENT/SUBCONTRACT APPROVALS

Except for the subawards and/or subcontracts specifically listed in the table below, the Recipient must notify the DOE Contracting Officer and Project Officer in writing 30 days prior to the execution of new or modified subawards/subcontracts. This notification does not constitute a waiver of the prior approval requirements outlined in 10 CFR 600, nor does it relieve the Recipient from its obligation to comply with applicable Federal statutes, regulations, and executive orders.

In order to satisfy this notification requirement, Recipient documentation must, as a minimum, include the following:

1. A description of the research to be performed, the service to be provided, or the equipment to be purchased;
2. Cost share commitment letter if the subawardee is providing cost share to the award;
3. An assurance that the process undertaken by the Recipient to solicit the subaward/subcontract complies with their written procurement procedures as outlined in 10 CFR 600.144, 10 CFR 600.236, or 10 CFR 600.331;
4. An assurance that no planned, actual or apparent conflict of interest exists between the Recipient and the selected subawardee/subcontractor and that the Recipient’s written standards of conduct were followed;

5. A completed Environmental Questionnaire, if applicable;
6. An assurance that the subawardee/subcontractor is not a debarred or suspended entity; and
7. An assurance that all required award provisions will be flowed down in the resulting subaward/subcontract.

The Recipient is responsible for making a final determination to award or modify subawards/subcontracts under this agreement, but the Recipient may not proceed with the subaward/subcontract until the Contracting Officer determines, and provides the Recipient written notification, that the information provided is adequate.

Should the Recipient not receive a written notification of adequacy from the Contracting Officer within 30 days of the submission of the subaward/subcontract documentation stipulated above, Recipient may proceed to award or modify the proposed subaward/subcontract.

Subawards or agreements will not contain provisions that are inconsistent with the Cooperative Agreement nor would adversely affect the ability of the Recipient to perform its obligations under this Cooperative Agreement.

As shown in the Table below, DOE approval is provided for the following Phase IIa subcontracts at not-to-exceed costs shown below.

Sub-Recipient/ Sub-Contractor	Purpose	Phase IIa Budget
Air Liquide Process & Construction	ASU/CPU Engineering Design	[REDACTED]
B&W	Boiler, GQCS and BOP Engineering Design	[REDACTED]
Van Ness Feldman	Power Purchase Agreement (PPA) Support	[REDACTED]
Van Ness Feldman	Other Specialty Legal Counsel for Phase II	[REDACTED]
Van Ness Feldman	Specialty Legal Counsel for Negotiating Material and Service Contracts (Fuel, Plant O&M, CPU O&M)	[REDACTED]
URS	Owner's Engineer (OE) Support, including Project Management Support and NEPA and Permitting Support	[REDACTED]
Latham Watkins	Specialty Legal Counsel for Negotiating EPC Contracts (B&W JV, AL CPU, Perf & Comm, & AL ASU OTF)	[REDACTED]
McGuireWoods LLP	Illinois Legal Counsel	[REDACTED]
XMS Capital Partners LLP	Capital Financing Advisory Services	[REDACTED]
Patrick Engineering	MISO Interconnection Consulting Services	[REDACTED]
Business Structure Consulting TBD	Tax/Business Consulting	[REDACTED]
Lucinda Low Swartz, Esq	National Environmental Policy Act and Permitting Support	[REDACTED]
PKM Energy Consulting, LLC (Paul Champagne)	Development Services, including integration of commercial, legal, and financing activities	[REDACTED]
Total		[REDACTED]

**33. INDEMNITY**

a. The Recipient shall indemnify the Government and its officers, agents, or employees for any and all liability, including litigation expenses and attorneys' fees, arising from suits, actions, or claims of any character for death, bodily injury, or loss of or damage to property or to the environment, resulting from the Project, except to the extent that such liability results from the direct fault or negligence of Government officers, agents or employees, or to the extent such liability may be covered by applicable allowable costs provisions.

b. During Phase IIa, the Recipient will have DOE named as a third-party insured on its insurance policies providing general, umbrella, automobile and property coverage.

c. Prior to the commencement of any demolition or construction work at the Project site, the Recipient will have DOE named as a third-party insured on any insurance policies covering the Recipient's activities at the site.

**34. COMMUNICATION PLANS**

Knowledge dissemination is an integral part of the Federally funded RD&D process. Effective dissemination requires planned, active, and coordinated participation of governmental entities and funded research partners.

To ensure the effective dissemination of knowledge gained during this RD&D Project, the recipient will consult with NETL's Public Affairs staff to identify communication goals, objectives, and strategies. The recipient will make an initial contact for consultation within 30 days of the award date. The recipient will make subsequent contacts whenever progress on the Project warrants external communication, but no less than once a quarter.

Actions and products designed to disseminate nonproprietary Project-related knowledge will be coordinated with NETL's Public Affairs staff. Examples of such actions and products include, but are not limited to:

- Press releases
- Articles in newspapers, newsletters, and magazines
- Papers in peer-reviewed journals
- Radio, television, and newspaper interviews
- Presentation of research results at conferences, workshops, and seminars
- Publication of results on web pages
- Information for government officials

When issuing statements, press releases, requests for proposals, bid solicitations, and other documents describing this Project, the Recipient shall acknowledge federal funding by clearly stating (1) the percentage of the total cost of the Project which will be financed with Federal money, and (2) the dollar amount of Federal funds for the Project.

All Recipient press releases shall be reviewed and approved by DOE prior to issuance. Therefore, the Recipient shall, at least ten (10) calendar days prior to the planned issue date, submit a draft copy to the Contracting Officer of any planned press releases related to work performed under this award. The Contracting Officer will then obtain necessary reviews and clearances and provide the Recipient with the results of such reviews prior to the planned issue date.

### **35. POST-COMPLETION REVIEW**

Within two (2) years after completion of the Project, the Recipient agrees to participate with DOE in a post-completion Project review meeting. The time and location of the meeting will be established by agreement of the Parties. The purpose of the meeting is to review the success of the Project as well as any problems that may have arisen since Project completion.

### **36. DECISION POINTS AND COORDINATION OF DOE DECISIONS REGARDING FUTUREGEN 2.0**

The Parties agree that: (1) the scope of the FutureGen 2.0 program comprises research, development and large-scale test activities involving oxy-combustion and CO<sub>2</sub> capture, transportation, and sequestration; (2) the FutureGen 2.0 program consists of the "FutureGen 2.0: Oxy-combustion Large Scale Test" and the "FutureGen 2.0: Pipeline and Regional CO<sub>2</sub> Storage Reservoir Project"; and (3) both of these Projects are needed to fully achieve the objectives of the program. The Parties also agree that the FutureGen 2.0 program is complex and may face technical, financial, regulatory, and other issues that cannot be anticipated at this time. In light of the potential for such issues to arise and DOE's need to ensure prudent stewardship of federal funds, DOE requires flexibility in the coordination and phasing of its decision-making regarding funding subsequent Phases and Subphases of these two Projects. Accordingly, DOE will assess at each decision point for Recipient's Project the overall status and progress of the FutureGen 2.0 program, and may, based on that assessment and in its sole discretion, delay a decision on funding the next Phase or Subphase of Recipient's Project, or interrupt, suspend or terminate Recipient's Cooperative Agreement. In lieu of terminating Recipient's Cooperative Agreement, DOE may propose a modification to it. In the event DOE proposes a modification, it agrees to negotiate in good faith with Recipient to reach agreement on how best to effectuate the proposed modification.

Should the Recipient decide to terminate the FutureGen 2.0: Pipeline and Regional CO<sub>2</sub> Storage Reservoir Project, the parties agree that DOE may suspend payments to Recipient under this Cooperative Agreement until DOE can assess how best to proceed, and may, based on that assessment and in its sole discretion, continue with, propose modifications to, interrupt, suspend or terminate Recipient's Cooperative Agreement. In the event DOE proposes a

modification to the Cooperative Agreement, it will negotiate in good faith with Recipient to reach agreement on how best to effectuate the proposed modification. In the event DOE terminates or delays the Project pursuant to this Cooperative Agreement, DOE agrees that it will continue to reimburse Recipient for allowable costs associated with the delay or termination in accordance with OMB Circular A-21.

In light of the substantial federal cost share and the significant risks resulting from Ameren's decision not to proceed with this Project, substantial involvement is necessary between DOE and the Recipient during performance of this Cooperative Agreement. Pursuant to 10 CFR 600.5(b)&(d), DOE will share responsibility for the management, control, and direction of the Project, and has the right to intervene in the conduct and performance of project activities for programmatic reasons.

#### Decision Point Applications:

- a. Decision Point Application – A Decision Point Application is a non-competitive application whereby the Recipient requests permission from DOE to continue the Project into subsequent Phases within a previously approved Project Period.
- b. In order to receive continued DOE funding under the Project, Recipient shall submit Decision Point Applications at the conclusion of the following Phases of the Project: (I) Project Definition, Pre-FEED; (II) National Environmental Policy Act (NEPA), Permitting, and Design; (III) Construction and Commissioning as delineated in the SOPO.
- c. Submission Requirements –The Recipient shall prepare and submit the Decision Point Application in accordance with the requirements of this clause and consistent with the prescribed content, format, and submission instructions outlined and identified for each Phase in the Statement of Project Objectives.
- d. DOE Approval – DOE's decision whether to proceed into subsequent Phases of Recipient's Project will be based on (1) availability of funds; (2) substantial progress towards meeting the objectives of the Project and of FutureGen 2.0; (3) submittal of required reports; (4) compliance with the Terms and Conditions of the Award; and (5) the ability of the Project to meet the objectives of the FutureGen 2.0 program, including but not limited to the ability of the Recipient to prudently expend the ARRA funds obligated to this Cooperative Agreement prior to September 30, 2015. This decision should occur in a timely manner, consistent with the Project schedule.
- e. Subphases – DOE has established a number of Subphases within Phase II. Although the Recipient is not required to submit a Decision Point Application to DOE before proceeding to the next Subphase, the Recipient must submit to DOE satisfactory evidence that it has achieved the accomplishments for the current Subphase by the date specified.
- f. The Recipient is not required to submit a Decision Point Application at any point during the Project. If at any point during or following the completion of a Phase of the Project, the Recipient determines that it no longer wishes to continue with the Project, the Recipient shall notify the Contracting Officer in writing of such decision, and Recipient's performance under this Cooperative Agreement shall be considered complete.

DOE reserves the right to de-obligate any remaining funds obligated to the Cooperative Agreement, if, at a Decision Point, it determines not to fund subsequent Phases of the Project.

### **37. COST OVERRUN**

The Government is under no obligation to share any cost overruns (i.e., costs incurred during the Project that are more than those estimated at the date of award). DOE does not plan to set-aside funds for overruns. If appropriated funds are available in the future for supporting overruns, the Government's share of overruns will not exceed the Government's percentage cost share for the overall Project as specified in Article 5.

### **38. PRIMAVERA**

The Recipient shall provide the necessary project management files developed using Primavera to DOE. The Primavera files shall include work breakdown structure, resource loaded schedules, and milestones. Relevant

supporting information, such as assumptions and calculations, shall be provided to facilitate analysis and due diligence for project management purposes. Other requirements shall include:

- a. A baseline (target) Project resource loaded schedule (including earned values) is due at the initiation of Phase II.
- b. All baseline and updated schedules are to be provided in a format that is readable with Oracle Primavera P6 Version 7.0, as an exported (.xer) file. These schedules shall be fully resource-loaded, and percent completion shall be shown as “Schedule % Complete”, as well as “Physical % Complete” where appropriate. The schedule is not required to be cost-loaded in Primavera.
- c. Background and supporting documentation is also required to be submitted with the baseline schedule and with each update schedule when an item below is changed, to include, but not limited to, the following:
  - i. Oracle Primavera layout (.plf) file;
  - ii. The summary document describing the principle changes made to the update;
  - iii. A list of the Project schedule calendar(s) used, and how constructed;
  - iv. A list of the Project roles (position titles) used, where appropriate;
  - v. A list of the Project labor resources (names of persons used to fill roles) where appropriate;
  - vi. A list of the Project activity codes;
  - vii. A list of user-defined fields, and how constructed;
  - viii. The variance analysis reports;

Note 1. The schedule and cost data will enable NETL Project Managers to effectively comply with ARRA requirements and to perform risk analysis. The Oracle Primavera schedule will be used by NETL to independently analyze and track changes in the updates, and to produce summary reports for NETL upper management with profiles of labor, costs, equipment and materials usage, and the trends and variances in schedule, costs, and scope.

Note 2. The total Project costs shall include (but not limited to) the following:

- a) Resource hours/days & costs including direct and indirect labor hours/days & costs, materials quantities & costs.
- b) Non-resource expenses including equipment rental or lease costs, training, travel, consulting and subcontractor charges. Expenses may be spread equally over the duration of an activity, unless otherwise specified.

### **39. WORK BREAKDOWN STRUCTURE**

The Recipient will manage and report on the technical scope, budget and schedule basis consistent with a minimum Level-5 product-oriented work breakdown structure that notionally represents the following systems: Level 1 is Project; Level 2 is Phases (e.g., Project Definition, Front End Engineering Design, Final Engineering, Procurement and Plant Construction, Test Period, etc.); Level 3 is Tasks (e.g., permitting, gasification, shift, gas cleanup, power island, CO<sub>2</sub> capture, CO<sub>2</sub> compression and transport/delivery, CO<sub>2</sub> injection and/or storage, and MVA); Level 4 is Sub-Task; Level 5 is Sub-Sub Task.

### **40. INTERIM INCURRED COST AUDITS**

DOE reserves the right to initiate an incurred cost audit for each Phase under this award. If the results of such audit indicate that there are questioned and/or unallowable costs which have been billed to the Project, Recipient agrees to enter into negotiations with DOE to determine what, if any, credit shall be issued to the DOE for such costs.

*The paragraph below shall be flowed down and included in the subcontract agreements with Babcock & Wilcox and Air Liquide.*

As a condition of this subcontract, [enter subrecipient name] agrees that the DOE reserves the right to initiate an incurred cost audit for each Phase under this award. If the results of such audit indicate that there are questioned and/or unallowable costs which have been billed to the Project, [enter subrecipient name] agrees to promptly notify Recipient of the dollar amount associated with such costs and further agrees to enter into negotiations with DOE and Recipient to determine what, if any, credit shall be issued to the DOE for such costs.

Notwithstanding the above, and in accordance with Article 6 entitled “*Rebudgeting and Recovery of Indirect Costs – Reimbursable Indirect Costs and Fringe Benefits*”, Recipient and subrecipients reserve the right to seek appropriate

accommodations for any under-recovered indirect costs or fringe benefits under the Project, subject to availability of DOE funds.

**41. LIMITATION ON DOE FUNDING**

It is the intent of DOE that all reimbursements made by the Government under this Cooperative Agreement be made with respect to costs that are non-operational in nature. As a result, DOE will not reimburse the FutureGen Industrial Alliance for any costs that are operational in nature.

**42. APPROVED RECIPIENT MEMBER LABOR RATES**

The Statement of Project Objectives (SOPO) includes a work scope that will be conducted (in aggregate) by the Alliance member companies. Member companies having approved financial management systems will bill at actual hourly rates. The direct labor being furnished from the remaining member companies will be billed at the following rates for the labor categories identified:

<u>Labor Category</u>	<u>Approved Hourly Rate</u>
Sr. Executive Manager	[REDACTED]
Sr. Technical Manager	[REDACTED]
Senior Engineer/Senior Engineer V	[REDACTED]
Legal Counsel	[REDACTED]

Rates for new Alliance members not having approved financial management systems will be subject to approval by the DOE Contracting Officer.

**43. EMPLOYEE COMPENSATION/FIXED BILLING RATES**

Recipient shall bill the project for labor expended by its own employees using the labor rates set forth below. Should the Recipient find that labor categories not reflected below are required to perform the project; the Recipient shall request approval of additional categories and rates from the DOE Contracting Officer.

Notwithstanding any other Article(s) of this agreement, the Government shall not reimburse the Recipient for labor at rates in excess of those identified below (including authorized amendments thereto). Labor costs in excess of these rates shall be borne by the Recipient and will not be considered allowable project costs for cost-sharing purposes.

<b>Labor Category</b>	<b>Unburdened Hourly Rate</b>
CEO	[REDACTED]
Contract and Procurement Mgr	[REDACTED]
Accounting & Administrative Mgr.	[REDACTED]
Executive Administrator	[REDACTED]
VP Generation	[REDACTED]
Oxy-Combustion Project Mgr.	[REDACTED]

**44. NOTICE OF HIGH RISK STATUS – DOE’S INCREASED LEVEL OF OVERSIGHT AND DUE DILIGENCE**

Pursuant to 10 CFR 600.114 and DOE’s Guide to Financial Assistance Section 2.5.4, DOE has determined the Recipient to be “high-risk” because of its substantial dependence on federal funding for the Project and that the availability of this funding expires on September 30, 2015. As a result, DOE has determined that there is a need to protect the Government’s financial interest by providing an increased level of oversight, due diligence, and control in the management and administration of the Project such that, if any of the following events<sup>3</sup> occur, DOE may, at its sole discretion, unilaterally terminate the award:

<sup>3</sup> It is understood that the identified events may be within the scope of the other FutureGen 2.0 Cooperative Agreement (DE-FE0001882).

1. Conditions required to definitize the Cooperative Agreements are not met (e.g., hiring of critical key personnel, execution of power plant Asset Purchase Agreement, providing evidence of non-federal cost share, and providing expanded IP rights to Phase II work products).
2. Withdrawal of a subrecipient or critical subcontractor (i.e., B&W, Air Liquide, URS, Burns & McDonnell, or Battelle), if replacement resources are not available on a schedule that maintains the ability to prudently expend the ARRA funding by the statutory deadline.
3. Non-appealable denial of any permit or authorization necessary to secure financing (e.g., CO<sub>2</sub> injection, air construction, or water construction permits) or other delay in permitting that compromises the Recipient's ability to prudently expend the ARRA funding by the statutory deadline.
4. Loss of the power purchase agreements or sourcing agreement due to court or other governmental action.
5. Termination of the power plant Asset Purchase Agreement.
6. Interruption of retrofit-ready maintenance activities at the power plant if the interruption renders the power plant asset unsuitable for use.
7. Definitive determination that the CO<sub>2</sub> storage site geology is unsuitable.
8. Capital cost of the Project increase by 20% or more.
9. Determination by a court or regulatory authority that the power plant is subject to new source review (NSR).
10. Determination that the project cannot be financed on a schedule that maintains the Recipient's ability to prudently expend the ARRA funding by the statutory deadline.

#### **45. CONDITIONS ON AWARD/DEFINITIZATION OF PHASE II**

DOE has authorized continuation into Phase II of the project subject to satisfactory resolution and negotiation of the following Conditions on Award as specified in paragraphs A through F. The time period established to satisfactorily resolve the Conditions on Award is referred to as the definitization period and is the period starting with the Effective Date of this Amendment through April 9, 2013.

Notwithstanding any other Article within this Cooperative Agreement, only certain activities (paragraph A) and costs (paragraph B) are eligible for reimbursement by DOE during the definitization period.

DOE's determination that these Conditions have been satisfactorily resolved would be made through an amendment to the Cooperative Agreement.

##### **A. APPROVED PHASE II PERFORMANCE ACTIVITIES**

Consistent with the Subphase IIa SOPO, the costs of the following activities constitute allowable costs during the Phase II definitization period. The costs of other activities are considered unallowable.

- Project management and controls, including but not limited to reporting and rebaselining the schedule and cash flow for the actual Phase II start date
- Development of engineering services agreements with URS, Babcock & Wilcox (B&W), and Air Liquide (A-L)
- Development of second tier subcontracts (e.g., B&W Joint Venture and Air Liquide Champigny)
- Finalization of teaming agreement
- Initiate remobilization of engineering staff
- Permitting, including air and water permit support
- Finalization of heat balance
- Initiate administrative implementation of PPA
- EIS support
- Business structuring and financing activities
- G&A activities

##### **B. TOTAL ESTIMATED PROJECT COSTS/PAYMENT OF COSTS**

The Total Estimated Project Costs identified in Article 5.a are based on the Recipient's "Best and Final Decision

Point Application” dated October 9, 2012. DOE has not yet accepted the costs associated with Phases II through IV. Final review of the Recipient’s rebaselined Phase II costs will be completed during the definitization of the Cooperative Agreement. Review of the costs for Phases III through IV will occur as part of the Decision Point Application process.

In order to facilitate DOE’s review and acceptance of a Phase II budget within the definitization period, the Recipient must provide, not later than March 25, 2013, separate, detailed cost breakdowns for the Recipient and each major sub-recipient and subcontractor by year, Task, and Subtask.

The Recipient shall also provide a summary level cost breakdown for Phases III and IV.

In the event, Recipient does not deliver an acceptable budget by said date, either DOE or Recipient may declare the award terminated by mutual agreement of the parties upon written notice to the other party.

DOE and the Recipient agree that, during the definitization period, the Total Estimated Project Costs may be adjusted based on the results of the review and other matters affecting the estimate. If the Parties cannot mutually agree to final estimated Project costs, the Parties hereby agree that the award will be deemed terminated by mutual agreement of the parties. DOE reserves the right to unilaterally deobligate the balance of funds obligated, but not authorized for expenditure, in the event any one of these Conditions on Award are not satisfied and the Project is terminated.

Notwithstanding DOE’s pending review of the remaining Project budget, DOE has reviewed and accepted a budget of \$3,327,583 (DOE: \$3,294,307; Cost Share: \$33,276) associated with the Subphase IIa SOPO. The Recipient may incur costs associated with allowable project activities up to this amount. The Recipient may incur costs beyond this limit at its own risk, subject to later reimbursement by DOE in the event the Project proceeds beyond the definitization period.

### **C. STATEMENT OF PROJECT OBJECTIVES/SCHEDULE**

Attachment 2 contains the Statement of Project Objectives. DOE and the Recipient agree that only work associated with Subphase IIa activities is authorized for reimbursement at this time. The Parties further agree that the SOPO will be finalized during the definitization period. To facilitate definitization, the Recipient shall provide DOE with a fully-integrated SOPO (at WBS Level 5) and schedule covering Phase II of the project that reflects the Subphases specified in this Cooperative Agreement. Additionally, the Recipient will revise the SOPO for Phases III and IV as needed and will develop, in conjunction with Cooperative Agreement DE-FE0001882, an integrated project schedule which maintains a similar project structure (i.e., Phases) and clearly delineates Recipient and DOE decision points.

The final negotiated SOPO will be incorporated into this Cooperative Agreement through an amendment signed by the DOE Contracting Officer.

The fully integrated SOPO and schedule for Phases II, and a revised SOPO for Phases III and IV shall be provided to DOE not later than March 20, 2013. In the event, recipient does not deliver an acceptable SOPO and schedule by said date, either DOE or Recipient may declare the award terminated by mutual agreement of the parties upon written notice to the other party.

### **D. ADVANCE UNDERSTANDING ON INTELLECTUAL PROPERTY**

In consideration of the increased federal cost share of 99 percent, the Recipient acknowledges and agrees that as part of the definitization of this Cooperative Agreement, the Recipient, its sub-recipients, and other partners must provide DOE with expanded rights in the intellectual property developed under this Agreement that are acceptable to DOE in its sole discretion. The expanded rights would be extinguished should the Recipient achieve financial close and take the Project into Phase III.

Accordingly, DOE, the Recipient and its sub-recipients shall begin discussions on an advance understanding of intellectual property as soon as practical after the effective date of this cooperative agreement amendment. By February 26, 2013, the Recipient and its sub-recipients will provide a basic set of principles to DOE for addressing DOE’s expanded rights request. Not later than March 20, 2013, the Parties must agree on the following lists of

expanded rights that can be inserted into Attachment 1 – Intellectual Property Provisions:

- a publicly releasable list of protected data;
- a publicly releasable list of limited rights data;
- a publicly releasable list of restricted computer software; and
- a listing of the expanded technical data deliverable with unlimited rights.

During the conditional period of the cooperative agreement, Attachment 1 – Intellectual Property Provisions, which was applicable during Phase 1 remains in force unless and until a fully definitized cooperative agreement is issued.

The final agreed-to listings of data will be incorporated into the Cooperative Agreement through an amendment signed by the DOE Contracting Officer.

#### **E. HIRING OF KEY PERSONNEL**

For the purposes of this paragraph, “critical personnel” are defined as i) Vice President Generation and ii) Oxy-combustion Project Manager. In order to ensure the Alliance has adequate resources to fulfill its Phase II obligations, the Alliance is expected to hire these critical personnel. These full-time employees must possess: 1) extensive infrastructure construction management experience with both new and retrofit projects, 2) experience with DOE projects, 3) background in CO<sub>2</sub> capture and storage, and 4) a proven track record of implementing best practices in the power generation sector. By March 1, 2013, the Recipient will provide evidence that candidates for both positions are under an employment option agreement and have been notified that the Alliance will execute the option agreements. By March 28, 2013, the Recipient shall have the critical personnel hired.

#### **F. DEFINITIZATION ELEMENTS AND PERIOD**

For information purposes, the schedule for submission and resolution of items for the definitization period is summarized as follows:

<b>Not later than:</b>	<b>Action:</b>	<b>Reference Article /paragraph:</b>
<i>March 1, 2013</i>	Recipient provides employment option agreements for critical personnel	45E
<i>March 20, 2013</i>	Recipient and DOE agree on expanded data rights	45D
<i>March 20, 2013</i>	Recipient submits fully integrated Phase II SOPO and schedule at WBS Level 5, and revised SOPO for Phases III and IV	45C
<i>March 25, 2013</i>	Recipient submits detailed budgets	45B
<i>March 28, 2013</i>	Recipient submits certificates to DOE showing that DOE has been named as a third-party insured in Recipient’s policies; Recipient describes how it provides indemnity to DOE (sources of funds, procedure, etc.)	33b
<i>March 28, 2013</i>	Recipient provides evidence critical personnel are hired	45E

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**ATTACHMENT 1 - INTELLECTUAL PROPERTY PROVISIONS**

**Intellectual Property Provisions (CDLB-1003)  
Cooperative Agreement - Special Data Statute  
Research, Development, or Demonstration  
Large Businesses, State and Local Governments, and Foreign Entities**

- 01. FAR 52.227-1: Authorization and Consent - Alternate I (Dec 2007)**
- 02. FAR 52.227-2: Notice and Assistance Regarding Patent and Copyright Infringement (Dec 2007)**
- 03. 10 CFR 600.325 - Appendix A: Rights in Data - Programs Covered Under Special Data Statutes (OCT 2003) with Alternates I and II**
- 04. FAR 52.227-23 Rights to Proposal Data (Technical) (JUN 1987)**
- 05. 10 CFR 600.325 Appendix A, Patent Rights (Large Business Firms – No Waiver) (OCT 2003)\***
- 06. Limited Rights Data**
- 07. Restricted Computer Software**
- 08. Protected Data**
- 09. FAR 52.227-3 Patent Indemnity (APR 1984)**
- 10. FAR 52.227-9 Refund of Royalties (FEB 1995)**
- 11. Availability of Contract and Other Data**

NOTE: In reading these provisions, any reference to “contractor” shall mean “recipient,” and any reference to “contract” or “subcontract” shall mean “award” or “subaward.”

\* If a waiver of patent rights is granted, then provisions approved by the DOE patent counsel, in accordance with 10 CFR 784, will be substituted for this Patent Rights provision.

In accordance with 10 CFR 784, Recipient and its subrecipients ALPC and B&W, will each be requesting one or more Advanced Patent Waivers from DOE for this cooperative agreement and subawards thereunder. DOE agrees that it shall make reasonable efforts to promptly process Advanced Patent Waiver request(s) and the Recipient and its subrecipients will make reasonable efforts to promptly provide DOE Patent Counsel with any additional documentation or other response requested by DOE Patent Counsel.

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**01. FAR 52.227-1 Authorization and Consent - Alternate I (Dec 2007)**

(a) The Government authorizes and consents to all use and manufacture of any invention described in and covered by a United States patent in the performance of this contract or any subcontract at any tier.

(b) The Contractor shall include the substance of this clause, including this paragraph (b), in all subcontracts that are expected to exceed the simplified acquisition threshold. However, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.

(End of clause)

**02. FAR 52.227-2 Notice and Assistance Regarding Patent and Copyright Infringement (Dec 2007)**

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copyright infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed under this contract, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in the Contractor's possession pertaining to such claim or suit. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(c) The Contractor shall include the substance of this clause, including this paragraph (c), in all subcontracts that are expected to exceed the simplified acquisition threshold.

(End of clause)

**03. 10 CFR 600.325 Appendix A, Rights in Data - Programs Covered Under Special Data Statutes (OCT 2003) with Alternates I and II**

(a) Definitions

Computer Data Bases, as used in this clause, means a collection of data in a form capable of, and for the purpose of, being stored in, processed, and operated on by a computer. The term does not include computer software.

Computer software, as used in this clause, means (i) computer programs which are data comprising a series of instructions, rules, routines, or statements, regardless of the media in which recorded, that allow or cause a computer to perform a specific operation or series of operations and (ii) data comprising source code listings, design details, algorithms, processes, flow charts, formulae and related material that would enable the computer program to be produced, created or compiled. The term does not include computer data bases.

Data, as used in this clause, means recorded information, regardless of form or the media on which it may be recorded. The term includes technical data and computer software. The term does not include information incidental to administration, such as financial, administrative, cost or pricing or management information.

Form, fit, and function data, as used in this clause, means data relating to items, components, or processes that are sufficient to enable physical and functional interchangeability as well as data identifying source, size, configuration, mating and attachment characteristics, functional characteristics, and performance requirements except that for computer software it means data identifying source, functional characteristics, and performance requirements but specifically excludes the source code, algorithm, process, formulae, and flow charts of the software.

Limited rights data, as used in this clause, means data (other than computer software) developed at private expense that embody trade secrets or are commercial or financial and confidential or privileged.

Restricted computer software, as used in this clause, means computer software developed at private expense and that is a trade secret; is commercial or financial and confidential or privileged; or is published copyrighted computer

software; including modifications of such computer software.

Protected data, as used in this clause, means technical data or commercial or financial data first produced in the performance of the award which, if it had been obtained from and first produced by a non-federal party, would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of 5 U.S.C. 552(b)(4) and which data is marked as being protected data by a party to the award.

Protected rights, as used in this clause, mean the rights in protected data set forth in the Protected Rights Notice of paragraph (g) of this clause.

Technical data, as used in this clause, means that data which are of a scientific or technical nature. Technical data does not include computer software, but does include manuals and instructional materials and technical data formatted as a computer data base.

Unlimited rights, as used in this clause, means the right of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose whatsoever, and to have or permit others to do so.

(b) Allocation of Rights

(1) Except as provided in paragraph (c) of this clause regarding copyright, the Government shall have unlimited rights in--

- (i) Data specifically identified in this agreement as data to be delivered without restriction;
- (ii) Form, fit, and function data delivered under this agreement;
- (iii) Data delivered under this agreement (except for restricted computer software) that constitute manuals or instructional and training material for installation, operation, or routine maintenance and repair of items, components, or processes delivered or furnished for use under this agreement; and

(iv) All other data delivered under this agreement unless provided otherwise for protected data in accordance with paragraph (g) of this clause or for limited rights data or restricted computer software in accordance with paragraph (h) of this clause.

(2) The Recipient shall have the right to--

- (i) Protect rights in protected data delivered under this agreement in the manner and to the extent provided in paragraph (g) of this clause;
- (ii) Withhold from delivery those data which are limited rights data or restricted computer software to the extent provided in paragraph (h) of this clause;
- (iii) Substantiate use of, add, or correct protected rights or copyrights notices and to take other appropriate action, in accordance with paragraph (e) of this clause; and
- (iv) Establish claim to copyright subsisting in data first produced in the performance of this agreement to the extent provided in subparagraph (c)(1) of this clause.

(c) Copyright

(1) Data first produced in the performance of this agreement. Except as otherwise specifically provided in this agreement, the Recipient may establish, without the prior approval of the Contracting Officer, claim to copyright subsisting in any data first produced in the performance of this agreement. If claim to copyright is made, the Recipient shall affix the applicable copyright notice of 17 U.S.C. 401 or 402 and acknowledgment of Government sponsorship (including agreement number) to the data when such data are delivered to the Government, as well as when the data are published or deposited for registration as a published work in the U.S. Copyright Office. For such copyrighted data, including computer software, the Recipient grants to the Government, and others acting on its behalf, a paid-up nonexclusive, irrevocable, worldwide license to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government, for all such data.

(2) Data not first produced in the performance of this agreement. The Recipient shall not, without prior written permission of the Contracting Officer, incorporate in data delivered under this agreement any data that are not first produced in the performance of this agreement and that contain the copyright notice of 17 U.S.C. 401 or 402, unless the Recipient identifies such data and grants to the Government, or acquires on its behalf, a license of the same scope as set forth in subparagraph (c)(1) of this clause; provided, however, that if such data are computer software, the Government shall acquire a copyright license as set forth in subparagraph (h)(3) of this clause if included in this agreement or as otherwise may be provided in a collateral agreement incorporated or made a part of this agreement.

(3) Removal of copyright notices. The Government agrees not to remove any copyright notices placed on data

pursuant to this paragraph (c), and to include such notices on all reproductions of the data.

(d) Release, Publication and Use of Data

(1) The Recipient shall have the right to use, release to others, reproduce, distribute, or publish any data first produced or specifically used by the Recipient in the performance of this contract, except to the extent such data may be subject to the Federal export control or national security laws or regulations, or unless otherwise provided in this paragraph of this clause or expressly set forth in this contract.

(2) The Recipient agrees that to the extent it receives or is given access to data necessary for the performance of this agreement which contain restrictive markings, the Recipient shall treat the data in accordance with such markings unless otherwise specifically authorized in writing by the Contracting Officer.

(e) Unauthorized Marking of Data

(1) Notwithstanding any other provisions of this agreement concerning inspection or acceptance, if any data delivered under this agreement are marked with the notices specified in subparagraph (g)(1) or (h)(2) of this clause and use of such is not authorized by this clause, or if such data bears any other restrictive or limiting markings not authorized by this agreement, the Contracting Officer may at any time either return the data to the Recipient or cancel or ignore the markings. However, the following procedures shall apply prior to canceling or ignoring the markings.

(i) The Contracting Officer shall make written inquiry to the Recipient affording the Recipient 30 days from receipt of the inquiry to provide written justification to substantiate the propriety of the markings;

(ii) If the Recipient fails to respond or fails to provide written justification to substantiate the propriety of the markings within the 30-day period (or a longer time not exceeding 90 days approved in writing by the Contracting Officer for good cause shown), the Government shall have the right to cancel or ignore the markings at any time after said period and the data will no longer be made subject to any disclosure prohibitions.

(iii) If the Recipient provides written justification to substantiate the propriety of the markings within the period set in subdivision (e)(1)(i) of this clause, the Contracting Officer shall consider such written justification and determine whether or not the markings are to be cancelled or ignored. If the Contracting Officer determines that the markings are authorized, the Recipient shall be so notified in writing. If the Contracting Officer determines, with concurrence of the head of the contracting activity, that the markings are not authorized, the Contracting Officer shall furnish the Recipient a written determination, which determination shall become the final agency decision regarding the appropriateness of the markings unless the Recipient files suit in a court of competent jurisdiction within 90 days of receipt of the Contracting Officer's decision. The Government shall continue to abide by the markings under this subdivision (e)(1)(iii) until final resolution of the matter either by the Contracting Officer's determination become final (in which instance the Government shall thereafter have the right to cancel or ignore the markings at any time and the data will no longer be made subject to any disclosure prohibitions), or by final disposition of the matter by court decision if suit is filed.

(2) The time limits in the procedures set forth in subparagraph (e)(1) of this clause may be modified in accordance with agency regulations implementing the Freedom of Information Act (5 U.S.C. 552) if necessary to respond to a request there under.

(f) Omitted or Incorrect Markings

(1) Data delivered to the Government without either the limited rights or restricted rights notice as authorized by paragraph (h) of this clause, or the copyright notice required by paragraph (c) of this clause, shall be deemed to have been furnished with unlimited rights, and the Government assumes no liability for the disclosure, use, or reproduction of such data. However, to the extent the data has not been disclosed without restriction outside the Government, the Recipient may request, within 6 months (or a longer time approved by the Contracting Officer for good cause shown) after delivery of such data, permission to have notices placed on qualifying data at the Recipient's expense, and the Contracting Officer may agree to do so if the Recipient--

(i) Identifies the data to which the omitted notice is to be applied;

(ii) Demonstrates that the omission of the notice was inadvertent;

(iii) Establishes that the use of the proposed notice is authorized; and

(iv) Acknowledges that the Government has no liability with respect to the disclosure, use, or reproduction of

any such data made prior to the addition of the notice or resulting from the omission of the notice.

(2) The Contracting Officer may also:

- (i) Permit correction at the Recipient's expense of incorrect notices if the Recipient identifies the data on which correction of the notice is to be made, and demonstrates that the correct notice is authorized; or
- (ii) Correct any incorrect notices.

(g) Rights to Protected Data

(1) The Recipient may, with the concurrence of DOE, claim and mark as protected data, any data first produced in the performance of this award that would have been treated as a trade secret if developed at private expense. Any such claimed "protected data" will be clearly marked with the following Protected Rights Notice, and will be treated in accordance with such Notice, subject to the provisions of paragraphs (e) and (f) of this clause.

PROTECTED RIGHTS NOTICE

These protected data were produced under agreement no. DE-FE0005054 with the U.S. Department of Energy and may not be published, disseminated, or disclosed to others outside the Government until five years after it was generated, unless express written authorization is obtained from the recipient. Upon expiration of the period of protection set forth in this Notice, the Government shall have unlimited rights in this data. This Notice shall be marked on any reproduction of this data, in whole or in part.

(End of notice).

(2) Any such marked Protected Data may be disclosed under obligations of confidentiality for the following purposes:

(a) For evaluation purposes under the restriction that the "Protected Data" be retained in confidence and not be further disclosed; or

(b) To subcontractors or other team members performing work under the Government's FutureGen program of which this award is a part, for information or use in connection with the work performed under their activity, and under the restriction that the Protected Data be retained in confidence and not be further disclosed

(3) The obligations of confidentiality and restrictions on publication and dissemination shall end for any Protected Data.

(a) At the end of the protected period;

(b) If the data becomes publicly known or available from other sources without a breach of the obligation of confidentiality with respect to the Protected Data;

(c) If the same data is independently developed by someone who did not have access to the Protected Data and such data is made available without obligations of confidentiality; or

(d) If the Recipient disseminates or authorizes another to disseminate such data without obligations of confidentiality.

(4) However, the Recipient agrees that the following types of data are not considered to be protected and shall be provided to the Government when required by this award without any claim that the data are Protected Data. The parties agree that notwithstanding the following lists of types of data, nothing precludes the Government from seeking delivery of additional data in accordance with this award, or from making publicly available additional nonprotected data, nor does the following list constitute any admission by the Government that technical data not on the list is Protected Data.

The following types of data pertain to all aspects of work or services performed under this award, including the coal handling/drying system, air separation unit, oxy-combustion boiler, gas clean-up systems, power block, instrumentation and controls, and CO<sub>2</sub> compression and transport systems.

1. Non-proprietary physical and chemical properties of feedstock coal and of the CO<sub>2</sub> capture system.

2. Equipment Lists – Non-proprietary summary of the major equipment (systems and subsystems) for the project plant. Equipment is to be identified by flow diagram, equipment type, and equipment number. General non-proprietary description data are to be provided for each equipment item, including, but not limited to, the number required for operation, size or capacity, major nonproprietary operating and design parameters, manufacturer and/or vendor.
3. Design Information – All non-proprietary project design information with sufficient background information to provide an overview of the project and to serve as a reference for the design considerations involved in a commercial-scale facility. This includes a non-proprietary overview description of the technology; non-proprietary process performance and the evaluations and operating philosophies upon which that performance is based; a set of non-proprietary equipment plot and elevation drawings, and process and instrumentation diagrams, which describe the plant configuration; and, non-proprietary experimental methods (by description or reference).
4. Process Flow Diagrams – Non-proprietary flow diagrams with all updates and modifications depicting process steps and interconnecting streams with qualitative descriptions of the process steps.
5. Stream Data – Non-proprietary stream data. This would include material and energy balances, both the expected values and ranges of flows, stream properties, and constituents at various operating conditions. Stream data may be included as part of the Process Flow Diagrams.
6. Environmental Emissions – Compositions and flow rates of all solid, liquid and gaseous streams discharged to the environment, as required by and submitted to regulatory agencies in the form of publicly disclosed data.
7. Plant Capital Cost Data – Non-proprietary data and documentation for all costs associated with the construction of the project plant, systems and subsystems, with a breakdown by process area and equipment type, defined as: coal handling, power block, oxy-combustion block, gas clean-up block, CO<sub>2</sub> compression, controls and electrical. Such non-proprietary data would be provided with a breakdown by process area (oxy-combustion, power block, balance of plant), which would permit this information to be used for systems economic analysis and other analyses related to the cost to capture CO<sub>2</sub>.
8. Plant Operating Cost Data - Non-proprietary data and documentation for all projected costs associated with the operation of the plant, systems and subsystems, under conditions that represent reliable plant performance. Non-proprietary performance data, start-up and operating experience information, overall plant and component availability, qualitative materials performance, and qualitative description of the control philosophy for the facility.

(5) The Government's sole obligation with respect to any protected data shall be as set forth in this paragraph (g).

(h) Protection of Limited Rights Data

(1) When data other than that listed in subparagraphs (b)(1)(i), (ii), and (iii) of this clause are specified to be delivered under this agreement and such data qualify as either limited rights data or restricted computer software, the Recipient, if the Recipient desires to continue protection of such data, shall withhold such data and not furnish them to the Government under this agreement. As a condition to this withholding the Recipient shall identify the data being withheld and furnish form, fit, and function data in lieu thereof.

(2) Notwithstanding subparagraph (h)(1) of this clause, the agreement may identify and specify the delivery of limited rights data, or the Contracting Officer may require by written request the delivery of limited rights data that has been withheld or would otherwise be withholdable. If delivery of such data is so required, the Recipient may affix the following "Limited Rights Notice" to the data and the Government will thereafter treat the data, in accordance with such Notice:

LIMITED RIGHTS NOTICE

(a) These data are submitted with limited rights under Government agreement No. DE-FE0005054 (and

subaward/contract No. \_\_\_\_\_, if appropriate). These data may be reproduced and used by the Government with the express limitation that they will not, without written permission of the Recipient, be used for purposes of manufacture nor disclosed outside the Government; except that the Government may disclose these data outside the Government for the following purposes, if any, provided that the Government makes such disclosure subject to prohibition against further use and disclosure:

- (1) Use (except for manufacture) by Federal support services contractors within the scope of their contracts;
- (2) This "limited rights data" may be disclosed for evaluation purposes under the restriction that the "limited rights data" be retained in confidence and not be further disclosed;
- (3) This "limited rights data" may be disclosed to other contractors participating in the Government's program of which this Recipient is a part for information or use (except for manufacture) in connection with the work performed under their awards and under the restriction that the "limited rights data" be retained in confidence and not be further disclosed;
- (4) This "limited rights data" may be used by the Government or others on its behalf for emergency repair or overhaul work under the restriction that the "limited rights data" be retained in confidence and not be further disclosed;
- (5) Release to a foreign government, or instrumentality thereof, as the interests of the United States Government may require, for information or evaluation, or for emergency repair or overhaul work by such government; and
- (6) As otherwise allowed in this agreement, use by the Government or others on its behalf to the extent necessary to enable the Government to complete the Statement of Project Objectives of this agreement.

(b) This Notice shall be marked on any reproduction of these data, in whole or in part.  
(End of notice)

(3)(i) Notwithstanding subparagraph (h)(1) of this clause, the agreement may identify and specify the delivery of restricted computer software, or the Contracting Officer may require by written request the delivery of restricted computer software that has been withheld or would otherwise be withholdable. If delivery of such computer software is so required, the Recipient may affix the following "Restricted Rights Notice" to the computer software and the Government will thereafter treat the computer software, subject to paragraphs (d) and (e) of this clause, in accordance with the Notice:

#### RESTRICTED RIGHTS NOTICE

(a) This computer software is submitted with restricted rights under Government Agreement No. DE-FE0005054 (and subaward/contract \_\_\_\_\_, if appropriate). It may not be used, reproduced, or disclosed by the Government except as provided in paragraph (b) of this Notice or as otherwise expressly stated in the agreement.

(b) This computer software may be—

- (1) Used or copied for use in or with the computer or computers for which it was acquired, including use at any Government installation to which such computer or computers may be transferred;
- (2) Used or copied for use in a backup computer if any computer for which it was acquired is inoperative;
- (3) Reproduced for safekeeping (archives) or backup purposes;
- (4) Modified, adapted, or combined with other computer software, provided that the modified, combined, or adapted portions of the derivative software are made subject to the same restricted rights;
- (5) Disclosed to and reproduced for use by support service Recipients in accordance with subparagraphs (b)(1) through (4) of this clause, provided the Government makes such disclosure or reproduction subject to these restricted rights;
- (6) Used or copied for use in or transferred to a replacement computer; and
- (7) As otherwise allowed in this agreement, use by the Government or others on its behalf to the extent necessary to enable the Government to complete the Statement of Project Objectives of this agreement.

(c) Notwithstanding the foregoing, if this computer software is published copyrighted computer software, it is licensed to the Government, without disclosure prohibitions, with the minimum rights set forth in paragraph (b) of this clause.

(d) Any other rights or limitations regarding the use, duplication, or disclosure of this computer software are to be

expressly stated in, or incorporated in, the agreement.

(e) This Notice shall be marked on any reproduction of this computer software, in whole or in part.  
(End of notice)

(ii) Where it is impractical to include the Restricted Rights Notice on restricted computer software, the following short-form Notice may be used in lieu thereof:

**RESTRICTED RIGHTS NOTICE**

Use, reproduction, or disclosure is subject to restrictions set forth in Agreement No. DE-FE0005054 (and subaward/contract \_\_\_\_\_, if appropriate) with \_\_\_\_\_ (name of Recipient and subrecipient/contractor).  
(End of notice)

(iii) If restricted computer software is delivered with the copyright notice of 17 U.S.C. 401, it will be presumed to be published copyrighted computer software licensed to the Government without disclosure prohibitions, with the minimum rights set forth in paragraph (b) of this clause, unless the Recipient includes the following statement with such copyright notice: "Unpublished--rights reserved under the Copyright Laws of the United States."  
(End of clause)

(i) Subaward/Contract

The Recipient has the responsibility to obtain from its subrecipients/contractors all data and rights therein necessary to fulfill the Recipient's obligations to the Government under this agreement. If a subrecipient/contractor refuses to accept terms affording the Government such rights, the Recipient shall promptly bring such refusal to the attention of the Contracting Officer and not proceed with subaward/contract award without further authorization.

(j) Additional Data Requirements

In addition to the data specified elsewhere in this agreement to be delivered, the Contracting Officer may, at anytime during agreement performance or within a period of 3 years after acceptance of all items to be delivered under this agreement, order any data first produced or specifically used in the performance of this agreement. This clause is applicable to all data ordered under this subparagraph. Nothing contained in this subparagraph shall require the Recipient to deliver any data the withholding of which is authorized by this clause or data which are specifically identified in this agreement as not subject to this clause. When data are to be delivered under this subparagraph, the Recipient will be compensated for converting the data into the prescribed form, for reproduction, and for delivery.

(k) The Recipient agrees, except as may be otherwise specified in this agreement for specific data items listed as not subject to this paragraph, that the Contracting Officer or an authorized representative may, up to three years after acceptance of all items to be delivered under this contract, inspect at the Recipient's facility any data withheld pursuant to paragraph (h) of this clause, for purposes of verifying the Recipient's assertion pertaining to the limited rights or restricted rights status of the data or for evaluating work performance. Where the Recipient whose data are to be inspected demonstrates to the Contracting Officer that there would be a possible conflict of interest if the inspection were made by a particular representative, the Contracting Officer shall designate an alternate inspector.

(End of clause)

**04. FAR 52.227-23 Rights to Proposal Data (Technical) (JUN 1987)**

Except for data contained on pages 8-14, 16, 18-19, 21-25, 26-30, 32-36, 38, 40, 45, 48-49, 52-56, 60-62, 72, 74, 76, 77-85 and 87, it is agreed that as a condition of award of this contract, and notwithstanding the conditions of any notice appearing thereon, the Government shall have unlimited rights (as defined in the "Rights in Data—Programs Covered under Special Data Statutes" clause contained in this contract) in and to the technical data contained in the proposal dated August 6, 2010, upon which this contract is based.

**05. 10 CFR 600.325 Appendix A, Patent Rights (Large Business Firms - No Waiver) (OCT 2003)**

(a) Definitions

DOE patent waiver regulations, as used in this clause, means the Department of Energy patent waiver regulations in effect on the date of award. See 10 CFR part 784.

Invention, as used in this clause, means any invention or discovery which is or may be patentable or otherwise protectable under title 35 of the United States Code or any novel variety of plant that is or may be protectable under the Plant Variety Protection Act (7 U.S.C. 2321, et seq.).

Subject invention, as used in this clause, means any invention of the Recipient conceived or first actually reduced to practice in the course of or under this agreement.

(b) Allocations of Principal Rights

(1) Assignment to the Government. The Recipient agrees to assign to the Government the entire right, title, and interest throughout the world in and to each subject invention, except to the extent that rights are retained by the Recipient under subparagraph (b)(2) and paragraph (d) of this clause.

(2) Greater rights determinations. The Recipient, or an employee-inventor after consultation with the Recipient, may request greater rights than the nonexclusive license and the foreign patent rights provided in paragraph (d) of this clause on identified inventions in accordance with the DOE patent waiver regulation. Each determination of greater rights under this agreement shall be subject to paragraph (c) of this clause, unless otherwise provided in the greater rights determination, and to the reservations and conditions deemed to be appropriate by the Secretary of Energy or designee.

(c) Minimum Rights Acquired by the Government

With respect to each subject invention to which the Department of Energy grants the Recipient principal or exclusive rights, the Recipient agrees to grant to the Government: A nonexclusive, nontransferable, irrevocable, paidup license to practice or have practiced each subject invention throughout the world by or on behalf of the Government of the United States (including any Government agency); "march-in rights" as set forth in 37 CFR 401.14(a)(J); preference for U.S. industry as set forth in 37 CFR 401.14(a)(I); periodic reports upon request, no more frequently than annually, on the utilization or intent of utilization of a subject invention in a manner consistent with 35 U.S.C. 202(c)(5); and such Government rights in any instrument transferring rights in a subject invention.

(d) Minimum Rights to the Recipient

(1) The Recipient is hereby granted a revocable, nonexclusive, royalty-free license in each patent application filed in any country on a subject invention and any resulting patent in which the Government obtains title, unless the Recipient fails to disclose the subject invention within the times specified in subparagraph (e)(2) of this clause. The Recipient's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which the Recipient is a part and includes the right to grant sublicenses of the same scope to the extent the Recipient was legally obligated to do so at the time the agreement was awarded. The license is transferable only with the approval of DOE except when transferred to the successor of that part of the Recipient's business to which the invention pertains.

(2) The Recipient may request the right to acquire patent rights to a subject invention in any foreign country where the Government has elected not to secure such rights, subject to the minimum rights acquired by the Government similar to paragraph (c) of this clause. Such request must be made in writing to the Patent Counsel as part of the disclosure required by subparagraph (e)(2) of this clause, with a copy to the DOE Contracting Officer. DOE approval, if given, will be based on a determination that this would best serve the national interest.

(e) Invention Identification, Disclosures, and Reports

(1) The Recipient shall establish and maintain active and effective procedures to assure that subject inventions are promptly identified and disclosed to Recipient personnel responsible for patent matters within 6 months of conception and/or first actual reduction to practice, whichever occurs first in the performance of work under this agreement. These procedures shall include the maintenance of laboratory notebooks or equivalent records and other

records as are reasonably necessary to document the conception and/or the first actual reduction to practice of subject inventions, and records that show that the procedures for identifying and disclosing the inventions are followed. Upon request, the Recipient shall furnish the Contracting Officer a description of such procedures for evaluation and for determination as to their effectiveness.

(2) The Recipient shall disclose each subject invention to the DOE Patent Counsel with a copy to the Contracting Officer within 2 months after the inventor discloses it in writing to Recipient personnel responsible for patent matters or, if earlier, within 6 months after the Recipient becomes aware that a subject invention has been made, but in any event before any on sale, public use, or publication of such invention known to the Recipient. The disclosure to DOE shall be in the form of a written report and shall identify the agreement under which the invention was made and the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding, to the extent known at the time of the disclosure, of the nature, purpose, operation, and physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale, or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to DOE, the Recipient shall promptly notify Patent Counsel of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the Recipient. The report should also include any request for a greater rights determination in accordance with subparagraph (b)(2) of this clause. When an invention is disclosed to DOE under this paragraph, it shall be deemed to have been made in the manner specified in Sections (a)(1) and (a)(2) of 42 U.S.C. 5908, unless the Recipient contends in writing at the time the invention is disclosed that it was not so made.

(3) The Recipient shall furnish the Contracting Officer a final report, within 3 months after completion of the work listing all subject inventions or containing a statement that there were no such inventions, and listing all subawards/contracts at any tier containing a patent rights clause or containing a statement that there were no such subawards/contracts.

(4) The Recipient agrees to require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the Recipient each subject invention made under subaward/contract in order that the Recipient can comply with the disclosure provisions of paragraph (c) of this clause, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. This disclosure format should require, as a minimum, the information required by subparagraph (e)(2) of this clause.

(5) The Recipient agrees, subject to FAR 27.302(j), that the Government may duplicate and disclose subject invention disclosures and all other reports and papers furnished or required to be furnished pursuant to this clause.

(f) Examination of Records Relating to Inventions

(1) The Contracting Officer or any authorized representative shall, until 3 years after final payment under this agreement, have the right to examine any books (including laboratory notebooks), records, and documents of the Recipient relating to the conception or first actual reduction to practice of inventions in the same field of technology as the work under this agreement to determine whether--

- (i) Any such inventions are subject inventions;
- (ii) The Recipient has established and maintains the procedures required by subparagraphs (e)(1) and (4) of this clause;
- (iii) The Recipient and its inventors have complied with the procedures.

(2) If the Contracting Officer learns of an unreported Recipient invention which the Contracting Officer believes may be a subject invention, the Recipient may be required to disclose the invention to DOE for a determination of ownership rights.

(3) Any examination of records under this paragraph will be subject to appropriate conditions to protect the confidentiality of the information involved.

(g) Subaward/Contract

(1) The recipient shall include the clause PATENT RIGHTS (SMALL BUSINESS FIRMS AND NONPROFIT ORGANIZATIONS) (suitably modified to identify the parties) in all subawards/contracts, regardless of tier, for experimental, developmental, demonstration, or research work to be performed by a small business firm or domestic

nonprofit organization, except where the work of the subaward/contract is subject to an Exceptional Circumstances Determination by DOE. In all other subawards/contracts, regardless of tier, for experimental, developmental, demonstration, or research work, the Recipient shall include this clause (suitably modified to identify the parties), or an alternate clause as directed by the contracting officer. The Recipient shall not, as part of the consideration for awarding the subaward/contract, obtain rights in the subrecipient's/contractor's subject inventions.

(2) In the event of a refusal by a prospective subrecipient/contractor to accept such a clause the Recipient:

(i) Shall promptly submit a written notice to the Contracting Officer setting forth the subrecipient/contractor's reasons for such refusal and other pertinent information that may expedite disposition of the matter; and

(ii) Shall not proceed with such subaward/contract without the written authorization of the Contracting Officer.

(3) In the case of subawards/contracts at any tier, DOE, the subrecipient/contractor, and Recipient agree that the mutual obligations of the parties created by this clause constitute a contract between the subrecipient/contractor and DOE with respect to those matters covered by this clause.

(4) The Recipient shall promptly notify the Contracting Officer in writing upon the award of any subaward/contract at any tier containing a patent rights clause by identifying the subrecipient/contractor, the applicable patent rights clause, the work to be performed under the subaward/contract, and the dates of award and estimated completion.

Upon request of the Contracting Officer, the Recipient shall furnish a copy of such subaward/contract, and, no more frequently than annually, a listing of the subawards/contracts that have been awarded.

(5) The Recipient shall identify all subject inventions of a subrecipient/contractor of which it acquires knowledge in the performance of this agreement and shall notify the Patent Counsel, with a copy to the contracting officer, promptly upon identification of the inventions.

(h) Atomic Energy

(1) No claim for pecuniary award of compensation under the provisions of the Atomic Energy Act of 1954, as amended, shall be asserted with respect to any invention or discovery made or conceived in the course of or under this agreement.

(2) Except as otherwise authorized in writing by the Contracting Officer, the Recipient will obtain patent agreements to effectuate the provisions of subparagraph (h)(1) of this clause from all persons who perform any part of the work under this agreement, except nontechnical personnel, such as clerical employees and manual laborers.

(i) Publication

It is recognized that during the course of the work under this agreement, the Recipient or its employees may from time to time desire to release or publish information regarding scientific or technical developments conceived or first actually reduced to practice in the course of or under this agreement. In order that public disclosure of such information will not adversely affect the patent interests of DOE or the Recipient, patent approval for release of publication shall be secured from Patent Counsel prior to any such release or publication.

(j) Forfeiture of Rights in Unreported Subject Inventions

(1) The Recipient shall forfeit and assign to the Government, at the request of the Secretary of Energy or designee, all rights in any subject invention which the Recipient fails to report to Patent Counsel within six months after the time the Recipient:

(i) Files or causes to be filed a United States or foreign patent application thereon; or

(ii) Submits the final report required by subparagraph (e)(3) of this clause, whichever is later.

(2) However, the Recipient shall not forfeit rights in a subject invention if, within the time specified in subparagraph (e)(2) of this clause, the Recipient:

(i) Prepares a written decision based upon a review of the record that the invention was neither conceived nor first actually reduced to practice in the course of or under the agreement and delivers the decision to Patent Counsel, with a copy to the Contracting Officer, or

(ii) Contending that the invention is not a subject invention, the Recipient nevertheless discloses the invention and all facts pertinent to this contention to the Patent Counsel, with a copy of the Contracting Officer; or

(iii) Establishes that the failure to disclose did not result from the Recipient's fault or negligence.

(3) Pending written assignment of the patent application and patents on a subject invention determined by the

Secretary of Energy or designee to be forfeited (such determination to be a final decision under the Disputes clause of this agreement), the Recipient shall be deemed to hold the invention and the patent applications and patents pertaining thereto in trust for the Government. The forfeiture provision of this paragraph (j) shall be in addition to and shall not supersede other rights and remedies which the Government may have with respect to subject inventions.

(End of clause)

## 06. Limited Rights Data

1. The limited rights data subject to the "Rights in Data" clause in this award are listed below. This listing of data, which are asserted by the Recipient to be limited rights data, does not constitute an admission by the Government that the data is in fact limited rights data.

### Air Liquide Process and Construction, Inc.

- Data relating to properties of gases, liquids, mixtures, or adsorbents or catalysts include enthalpy, entropy, specific volume / density, gas constant, specific heat capacity, ratio of specific heats, compressibility factor, kinematic and dynamic viscosity, thermal conductivity and, for mixtures, equilibrium coefficients or solubilities.

The limited rights data related to adsorbents or catalysts include their type and composition, as well as properties characterizing their efficiency, such as adsorption isotherms and kinetics.

- Confidential data files associated with Restricted Computer Software
- Data relating to equipment performance resulting from field or lab tests (including without limitation dust filtration data)
- Data relating to design rules, best practices and standards
- Data relating to manufacturing tools and methods
- Equipment database used to pre-design and/or quote equipment
- Confidential tools and methods used to develop and optimize flow-sheets, design, manufacture, or to specify and purchase equipments
- Confidential information in invention disclosures and/or unpublished patent applications notably relating to compression and purification unit technology used for CO<sub>2</sub> capture and removal,:
  - "Management of Fuel Impurities in a Combustion Process",
  - "Integrated Carbon Dioxide Liquefaction and Storage",
  - "Heating and Emptying a Cold Box for CO<sub>2</sub> Purification",
  - "Use of Non-Condensable to Produce Cold Water",
  - "CO<sub>2</sub> Buffer Upstream of Compressor",
  - "CO<sub>2</sub> Collection Control",
  - "Improved CO<sub>2</sub> Purification Method",
  - "Compression method for a gas mix containing CO<sub>2</sub> and H<sub>2</sub>O with removing of H<sub>2</sub>O",
  - "Method for Burning Carbonated Fuels with Flue Gas Filtration before Compression",
  - "Apparatus and Process for Oxycombustion with CO<sub>2</sub> Capture",
  - "Process and apparatus for the separation of a dry and cooled CO<sub>2</sub>-containing gaseous mixture.",
  - "Method for Deoxygenation of Flue Gas",
  - "Method for CO<sub>2</sub> Separation",
  - "Liquid Carbon Dioxide Filling Station",
  - "Process of Cooling and Recycling Cooling Water",
  - "Process for the Cooling and Recycling of Carbon Dioxide",
  - "Coal Upgrading Utilizing Nitrogen and Carbon Dioxide",
  - "Coal Upgrading Utilizing Carbon Dioxide",
  - "Integration of an Air Separation Unit and a Carbon Dioxide Separation Unit",
  - "Process for CO<sub>2</sub> Separation",
  - "CO<sub>2</sub> Purification Method",
  - "Method for Eliminating Mercury from a Gas Containing CO<sub>2</sub> and Oxygen",
  - "Method for producing energy and capturing CO<sub>2</sub>", "CO<sub>2</sub> Energy Storage",

- “Method and Apparatus for Fluid Heating”,
- “Improved CO2 Capture Design”,
- “Adapting Of An Oxy-Combustion Plant To Energy Availability And To The Amount Of CO2 To Be Trapped”,
- “CO2 Separation Apparatus and Process for Oxy-Combustion Coal Power Plants”,
- “Process for Feed Gas Cooling in Reboiler during CO2 separation”,
- “Process and Apparatus for the Separation of a Gaseous Mixture”,
- “Improved CO2 Cold Box Design”,
- “Partial Capture in Oxycombustion”,
- “A Method for Concentrating the Impurities Contained in CO2”,
- “Chemical Loop Combustion Method”,
- “Control Method for CO2 Separation Process”,
- “Improved CPU Design”,
- “Process for Flue Gas Treatment”,
- “Control of Oxycombustion System”,
- “Method And Device For Drying A Gas Flow Rich In Carbon Dioxide”,
- “Process for Drying and Compressing a CO2 Stream”,
- “Process and Cryogenic Installation of Cooling Using of Liquid CO2”,
- “CO2 Cooling Back-up System”,
- “Precompression Drying of CO2”,
- “Method of Flue Gas Scrubbing”,
- “Improved CO2 liquefaction unit”,
- “Process for CO2 Recovery and Liquefaction”,
- “Process and Apparatus for the Separation of a Gas Mixture”,
- “CO2 Compression and Drying Process”
- “Method for Electrical Generation”

Babcock & Wilcox

**Background Technology**

To the extent developed at private expense, outside the scope of this or any other Government-funded project, and maintained as confidential:

**Design Standards**

1. All B&W pre-existing design procedures and Engineering Standards including welding standards and requirements, engineering calculations, stress analysis, insulation, structural support, flues & ducts, material preservation & storage, and quality assurance standards and requirements which are used in the execution of work for the power industry.
2. All design procedures and standards for conventional boiler and associated equipment.
3. All design procedures and standards for conventional AQCS (scrubbers and particulate removal) equipment and associated subsystems.
4. All quality manuals, control philosophies, functional logic diagrams, installation instructions, operating and maintenance instructions and other materials used in the procurement, erection and operation of B&W boiler and AQCS equipment.
5. All field test and unit operating data for existing or future installations of B&W boiler and AQCS equipment.

**Other Background Technology**

- 1) Detailed process heat and mass balances.
- 2) Detailed component heat and mass balances.
- 3) All project detailed equipment design, sizing, performance prediction, and structural calculations.
- 4) CFD numerical models, which include B&W proprietary designs, of the combustion and internal boiler processes, flues, and air/gas quality control equipment. These models are run on the B&W CFD software COMO to produce reportable data results.

- 5) Detailed specifications for purchased and fabricated equipment except design capacities and functional performance and as necessary to identify equipment or materials unique to oxy-firing.
- 6) Calculated (predicted) and measured Furnace Heat Fluxes
- 7) Calculated (predicted) and measured Furnace Exit Gas Temperature
- 8) Calculated (predicted) and measured oxygen flow splits to combustion system components, which includes burners, pulverizers, and recycle gas streams (primary, and secondary).
- 9) Calculated (predicted) and measured recycle gas mass flow rates; total, and splits to primary, and secondary.
- 10) Calculated (predicted) and measured flue gas compositions within the process.
- 11) Calculated (predicted) and measured flue gas temperatures within the process.
- 12) Wet Flue Gas Desulfurization (WFGD), baghouse, CDS, Dry Flue Gas Desulfurization (DFGD) parametric test data indicating the SO<sub>2</sub> removal as a function of specific changes in pH, L/G, gas velocity, tray and spray zone pressure drop, approach to saturation, bed temperatures, water injection rates, stoichiometry, recycle rates, etc.
- 13) Hg and SO<sub>3</sub> control additive injection rates and concentrations.

### **Oxycombustion Technology**

#### Combustion System Design

- Combustion system design spreadsheets, correlations, design factors, and calculation procedures as developed based on CEDF testing and related work prior to this project (burner and pulverizer design)

#### Boiler Design

- Furnace Performance calculation methods, correlations, and design factors
- Furnace circulation design calculation methods, correlations, and design factors
  - Heat flux distributions
  - Upset heat flux design
  - Critical heat flux criteria and data
  - Heat transfer correlations for tube/membrane wall design
- Convection Pass performance design calculation methods, correlations, and design factors
- Metals design calculation methods, correlations, and design factors

Wet Scrubber design calculation methods, correlations, and design factors

Dry Scrubber design calculation methods, correlations, and design factors

SCR design calculations, methods, correlations, and design factors

All CEDF Data, CEDF Design Reports, and CEDF Test Reports. Polishing Scrubber/Direct Contact Cooler design calculation methods, correlations, and design factors and integration with wet cooling tower

Airheater design for air and recycled flue gas

### **New Ideas (inventions) where Patent Applications are in progress but are not yet submitted**

NI Case 7322 and 7382 - Polishing Scrubber/Direct Contact Cooler design and integration with wet cooling tower.  
NI Case - SDA Air Infiltration Restriction Device (for Atomizer maintenance door)

2. If a patent is issued by the United States Patent and Trademark Office or the patent office of any foreign country based on any information asserted to be limited rights data, the Government will no longer treat any data contained in such issued patent as limited rights data. In addition, if any information asserted to be limited rights data results in or becomes a Subject Invention, as that term is defined in the patent rights clause of this agreement, the Government will only treat such data as limited rights data until the Recipient has filed its initial patent application.
3. The Recipient shall not introduce or utilize any limited rights data not identified in paragraph (1) above in the performance of the award without the expressed written permission of the Contracting Officer.

### **07. Restricted Computer Software**

The restricted computer software subject to the provisions of the “Rights in Data” clause in this agreement are listed below. This list of software programs, which are asserted by the Recipient to be restricted computer software, does not constitute an admission by the Government that the software is in fact restricted computer software.

Air Liquide Process and Construction, Inc.

- Computer programs and proprietary subsets of commercial software, including version of HYSYS that includes proprietary equation of state.
- Cost estimation software

Babcock & Wilcox

Furnace Performance Program – P8475

Flow and Pressure drop Program – P136

Tube/Membrane Temperature & Stress Program – P157

Boiler Performance Program – P140

Superheater Metals Program – P8722

Circulation Programs – P1086 and P13460

Combustion system design spreadsheets

Airheater Design Program – Spread Sheet

Pulverizer Design Program – Spread Sheet

Gas Side H&M Balance Program – Rule Stream Program

Wet FGD Absorber Performance and Mass Balance - Spreadsheet

Absorber Mass Balance and Performance program (WFGD MBP) - Rulestream program

WFGD Storage Silo Sizing - Spreadsheet

WFGD Pump Sizing - Spreadsheet

WFGD Tank Sizing – Spreadsheet

Wet FGD Pier Loading - Spreadsheet

ABSORB SDA material balance Program – Visual Basic

FF Sizing and Estimating Program – Spreadsheet

FF Performance Program – Spreadsheet

COMO – CFD Modeling software developed by B&W

The Recipient shall not introduce or utilize any restricted computer software not identified above without advance written notification of the Contracting Officer.

**08. Protected Data**

The following is a listing of data anticipated to be generated under this award that the Recipient expects will qualify as “Protected Data,” as that term is defined in the “Rights in Data” clause in this award. Incorporating this listing of data into this agreement does not constitute a guarantee by the Government that the data will in fact qualify for this designation.

Air Liquide Process and Construction *The items on this list are included to the extent that they do not disclose Restricted Computer Software and Limited Rights Data.*

- Results from simulations under HYSYS, PROSIM, ASPEN CUSTOM MODELER and any other simulating software using proprietary calculation methods notably for equipment sizing and development of plant process control schemes.
- Process Flow Diagrams and P&ID
- Process data sheets
- Design and equipment specifications
- Equipment drawings
- Equipment lists
- Data relating to equipment properties, notably for proprietary equipment (such as distillation columns, adsorbers, and heat exchangers) including dimensions (such as height, diameter), weight, vessel diameter, height and internals, distillation internal details.

- Single line diagrams

If a patent is issued by the United States Patent and Trademark Office or the patent office of any foreign country based on any information asserted to be Protected Data, the Government will no longer treat any data contained in such issued patent as Protected Data. In addition, if any information asserted to be Protected Data results in or becomes a Subject Invention, as that term is defined in the patent rights clause of this agreement, the Government will only treat such data as Protected Data until the Recipient has filed its initial patent application.

**09. FAR 52.227-3 Patent Indemnity (APR 1984)**

- (a) The Contractor shall indemnify the Government and its officers, agents, and employees against liability, including costs, for infringement of any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under 35 U.S.C. 181) arising out of the manufacture or delivery of supplies, the performance of services, or the construction, alteration, modification, or repair of real property (hereinafter referred to as "construction work") under this contract, or out of the use or disposal by or for the account of the Government of such supplies or construction work.
- (b) This indemnity shall not apply unless the Contractor shall have been informed as soon as practicable by the Government of the suit or action alleging such infringement and shall have been given such opportunity as is afforded by applicable laws, rules, or regulations to participate in its defense. Further, this indemnity shall not apply to -
  - (1) An infringement resulting from compliance with specific written instructions of the Contracting Officer directing a change in the supplies to be delivered or in the materials or equipment to be used, or directing a manner of performance of the contract not normally used by the Contractor;
  - (2) An infringement resulting from addition to or change in supplies or components furnished or construction work performed that was made subsequent to delivery or performance; or
  - (3) A claimed infringement that is unreasonably settled without the consent of the Contractor, unless required by final decree of a court of competent jurisdiction.

**10. FAR 52.227-9 Refund of Royalties (FEB 1995)**

- (a) The contract price includes certain amounts for royalties payable by the Contractor or subcontractors or both, which amounts have been reported to the Contracting Officer.
- (b) The term "royalties" as used in this clause refers to any costs or charges in the nature of royalties, license fees, patent or license amortization costs, or the like, for the use of or for rights in patents and patent applications in connection with performing this contract or any subcontract here-under. The term also includes any costs or charges associated with the access to, use of, or other right pertaining to data that is represented to be proprietary and is related to the performance of this contract or the copying of such data or data that is copyrighted.
- (c) The Contractor shall furnish to the Contracting Officer, before final payment under this contract, a statement of royalties paid or required to be paid in connection with performing this contract and subcontracts hereunder together with the reasons.
- (d) The Contractor will be compensated for royalties reported under paragraph (c) of this clause, only to the extent that such royalties were included in the contract price and are determined by the Contracting Officer to be properly chargeable to the Government and allocable to the contract. To the extent that any royalties that are included in the contract price are not, in fact, paid by the Contractor or are determined by the Contracting Officer not to be properly chargeable to the government and allocable to the contract, the contract price shall be reduced. Repayment or credit to the Government shall be made as the Contracting Officer directs. The approval by DOE of any individual payments or royalties shall not prevent the Government from contesting at any time

the enforceability, validity, scope of, or title to, any patent or the proprietary nature of data pursuant to which a royalty or other payment is to be or has been made.

- (e) If, at any time within 3 years after final payment under this contract, the Contractor for any reason is relieved in whole or in part from the payment of the royalties included in the final contract price as adjusted pursuant to paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer of that fact and shall reimburse the Government in a corresponding amount.
- (f) The substance of this clause, including this paragraph (f), shall be included in any subcontract in which the amount of royalties reported during negotiation of the subcontract exceeds \$250.

#### **11. Availability of Contract and Other Data**

(a) The Recipient will, for the entire period of Recipient's participation in the project at the Facility (including operation of the Facility) and for three years thereafter, whether or not under a Government Cooperative Agreement, keep and maintain all technical data, including limited rights data and data obtained from subcontractors and licensors, necessary to construct and/or operate the Facility, and all data including business and financial data necessary to evaluate the technical and economic operation of the Facility. During the entire period of construction and/or operation of the Facility, regardless of whether the Government participates past Design, the Recipient shall permit the Government and its representative the right to inspect at the Facility any data kept and maintained pursuant to this paragraph. The Recipient shall, after termination of the Government's participation in the project at the facility, periodically deliver reports to the Government on the construction and operation of the facility, which reports shall not include limited rights data.

(b) If the Recipient withdraws from this Cooperative Agreement or defaults after Design or Construction, the Government shall have the right to have all data kept and maintained pursuant to Paragraph (a) above, delivered to the Government or otherwise disposed of as the Contracting Officer shall direct upon such termination, unless delivery of such data has been excused under Articles 08 or 09 above. Any limited rights data delivered pursuant to this paragraph shall be marked as provided in Paragraph (g)(2) of the Rights in Data – General clause with the addition to the legend thereof after (a)(5) as follows: (6) Use by Government or others on its behalf to the extent necessary to enable the Government to complete Construction and/or Operations.

(c) The Recipient agrees to and does hereby grant to the Government or others acting on its behalf, an irrevocable nonexclusive paid-up license in and to any limited rights data of the Recipient which are incorporated or embodied in the design or construction or utilized in the operation of the Facility: (1) to practice, or to have practiced, by or for the Government at the Facility, and (2) to transfer such license with the transfer of that Facility. Further, the Recipient agrees to obtain an equivalent license from its contractors, subcontractors, and licensors, if any. The license granted pursuant to this subparagraph shall be for the limited purpose of completion, repair or operation of the demonstration facility.

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## **ATTACHMENT 2 - STATEMENT OF PROJECT OBJECTIVES (SOPO)**

### **RECOVERY ACT: FUTUREGEN 2.0 OXY-COMBUSTION LARGE SCALE TEST**

**THIS SOPO (PAGES 1 – 14 AND 25 – 54) COVERS ALL PROJECT PHASES  
IT WAS SUBMITTED WITH THE BEST & FINAL DECISION POINT APPLICATION TO ENTER  
PHASE II IN OCTOBER 2012**

#### **BACKGROUND**

The U.S. Department of Energy's (DOE) FutureGen 2.0 Program includes two projects; (1) a commercial-scale oxy-combustion project that will repower an idle electric power generating plant in Meredosia, Illinois (currently owned by Ameren Energy Resources [Ameren]), with advanced oxygen-combustion technology, capture at least 90 percent of the carbon dioxide (CO<sub>2</sub>) that would be emitted without capture technology, and reduce all criteria air pollutant emissions to near-zero levels (the Oxy-combustion Power Plant Project); and (2) a CO<sub>2</sub> Pipeline and Storage Project, which will transport and store the CO<sub>2</sub> produced by the oxy-combustion project in a deep saline geologic formation (the CO<sub>2</sub> Pipeline and Storage Project). The projects are planned in four phases:

- Phase I – Project Definition and Pre-Front-End Engineering Design (Pre-FEED)
- Phase II – National Environmental Policy Act (NEPA), Permitting, and Design
- Phase III – Construction and Commissioning
- Phase IV – Operations

As originally envisioned, Ameren was responsible for the Oxy-combustion Power Plant Project and the FutureGen Industrial Alliance (Alliance) was responsible for carrying out the CO<sub>2</sub> Pipeline and Storage Project through cooperative agreements with DOE. Ameren, however, decided in 2011 to reduce its role in the FutureGen 2.0 Program. With approval from DOE, the Alliance will assume responsibility for the Oxy-combustion Power Plant Project from Ameren at the start of Phase II. The Alliance and Babcock & Wilcox (B&W) and Air Liquide (AL) ("project partners") have formed a team to carry out the project that involves the design, construction, and testing of the advanced oxy-combustion power generation plant at the Meredosia Energy Center. The FutureGen 2.0 Oxy-Combustion Power Plant Project is being carried out under Cooperative Agreement No. DE-FE0005054.

The project partners will replace the existing Meredosia oil-fired boiler with a new oxy-combustion boiler that combusts coal in a nearly pure oxygen environment to sharply reduce air pollutant emissions and to capture CO<sub>2</sub> and transport it to the sequestration site. The redesigned

facility will consist of three distinct groups of equipment or “islands”: an Air Separation Unit (ASU) that will supply the oxygen to the boiler for combustion, the oxy-combustion boiler and related balance of plant, and a Compression and Purification Unit (CPU) that will remove, purify and compress the CO<sub>2</sub> contained in the flue gas for transport.

AL will be responsible for the design, construction, and operation of the ASU and the CPU. Air Liquide Large Liquid Industries Inc. [ALLLI] will provide oxygen “over the fence” (OTF) to the power plant and ALLLI will contract with Air Liquide Process and Construction [ALPC] to construct the ASU). The design of the ASU during Phase II will allow either ALLLI, Alliance, or joint ownership options. All Air Liquide Phase II work will be performed as a “sub-recipient” to the Alliance under the cooperative agreement.

B&W Power Generation Group (BWPGG) will provide design of the oxy-combustion boiler and core technology under a “sub-recipient” contract with the Alliance. [REDACTED]

[REDACTED] In addition to providing project management support to the Alliance, URS will serve as the Owner’s Engineer.

This Statement of Project Objectives (SOPO) has been revised as a result of Ameren’s public announcement that it closed the Meredosia Energy Center at year-end 2011, and expressed to DOE and the Alliance that it would not be committing to any financial commitments for project activities beyond Phase I. Ameren and the Alliance have negotiated an asset purchase agreement for those assets at the Meredosia Energy Center that are required to conduct the project and Ameren will continue to support the project in the area of permitting and plant maintenance.

This SOPO has been amended to provide substantially more detail for Phase II of the project as part of the Decision Point Application for Phase II (Phase II – DPA). Details on Phase I have been maintained in the SOPO for traceability and because Phase ID is not yet complete.

## **A. PROJECT OBJECTIVES**

To launch the project, Ameren formed a team to test oxy-combustion advanced clean coal power generation technology with carbon capture at their Meredosia Energy Center in west central Illinois. That team included B&W and AL as sub-recipients. Ameren subsequently added URS to the team as a principal support contractor. While the Alliance will assume Ameren’s lead role, the other team members will remain the same, with each assuming different scopes as described above.

The primary objective of the project is to design, finance, construct, and operate an oxy-combustion power generation facility at the Meredosia Energy Center that is fully integrated with a CO<sub>2</sub> pipeline and storage site.

This oxy-combustion coal-fueled test plant will:

- Be the world's first commercial-scale oxy-combustion repowering of coal plant based on B&W's proprietary technology;
- Evaluate the full integration of AL's innovative and proprietary ASU and CPU into a full-scale utility application for electric power generation;
- Demonstrate the technical and financial feasibility of using oxy-combustion technology for utility power plant applications;
- Demonstrate the technology is capable of near-zero emissions during routine, steady-state operations;
- Treat 100 percent of the flue gas and remove 90+ percent of the CO<sub>2</sub> resulting in the capture of more than 1 million metric tonnes per year (1 MMT/yr) of CO<sub>2</sub> from the plant at an 85 percent capacity factor;
- Show progress toward the overall carbon capture and storage (CCS) program goal of no more than a 35 percent increase in the cost of electricity;
- Support the State of Illinois' goals regarding the deployment of clean coal facilities;
- Support the development of CO<sub>2</sub> storage technology in Illinois;
- Generate 300 to 500 construction jobs over a 3- to 4-year period
- Restore and add to the employment levels that existed at the Meredosia Energy Center prior to its 2011 shutdown; and
- Demonstrate that Illinois coal can be an environmentally clean energy option for baseload electric generation that will save well-paying mining, manufacturing, engineering, and construction jobs in the power generation business as well as local and national jobs that support these industries with cars, trucks, mining equipment, housing, and other basic needs.

Oxy-combustion has matured from concept to a technology for CO<sub>2</sub> capture, which is now ready to demonstrate at commercial-scale. The process of combusting coal with oxygen to produce a high concentration of CO<sub>2</sub> in the boiler flue gas has been known for decades. In the 1990s, it gained interest as a means to reduce CO<sub>2</sub> levels in the atmosphere; several organizations began development efforts. B&W's initial investigations of oxy-combustion technology began in 1979 and gained momentum in the late 1990s when B&W joined CANMET's oxy-coal combustion consortium and participated in 1 MBtu/hr testing in Canada. B&W and AL entered into collaboration in 2000, and with funding from DOE, pilot-scale development began with testing of bituminous and sub-bituminous coals in B&W's 5 MBtu/hr SBS (Small Boiler Simulator).

In 2006, B&W and AL initiated the largest scale demonstration of oxy-coal combustion in the world. Modifications to B&W's 100 MBtu/hr (30 MWe) Clean Environment Development Facility (CEDF) were completed in late summer of 2007 and the first full oxy-combustion operation at this scale in the world was achieved on October 8, 2007. Successful testing of bituminous, sub-bituminous and lignite coals at the oxy-combustion test facility gave B&W and AL the confidence to take the next step in development for large-scale testing of a utility-scale oxy-combustion of coal.

FutureGen 2.0 incorporates the best technological thinking for the repowering of an existing electric utility plant with a modern oxy-combustion pulverized coal boiler, environmental control equipment, an ASU, and a CO<sub>2</sub> CPU. With the large population of pulverized coal boilers

presently in use in utility-scale electric generating plants, the successful test of the oxy-combustion pulverized coal technology will confirm the viability of repowering a potentially large population of existing coal-fired electric generating facilities and will demonstrate the commercial readiness of the oxy-combustion technology for new plant applications,

## **B. SCOPE OF THE PROJECT**

The project scope includes the project definition, design, procurement, financing, equipment fabrication and manufacture, installation, construction, startup, commissioning and performance testing, commercial operation, and testing of an integrated oxy-combustion coal plant with CO<sub>2</sub> capture, purification, and compression. The plant will generate approximately 168 MW gross output for sale in in Midwest Independent Transmission System Operator (MISO). The CO<sub>2</sub> will be purified and compressed for transport and delivered to a terminal point for transfer to the FutureGen 2.0 CO<sub>2</sub> Pipeline and Storage Project.

The scope of supply for the oxy-combustion boiler island and balance of plant [REDACTED] [REDACTED] will include the entire oxy-combustion power plant, excluding the AL supplied ASU and CPU. This scope includes, but is not limited to, the steam generator, burners, pulverizers, primary and secondary combustion fans and motors, air heater, interconnecting flues and ducts, structural steel, and platforms. The GQCS will include particulate filtration, dry sulfur dioxide and direct contact cooler polishing scrubbers, interconnecting flues, structural steel, and platforms. Interconnecting pipe, electrical wiring, controls, foundations and civil work will be supplied for the project. A new stack is included in the present scope and cost estimate.

Piping electrical wiring, instruments and controls and other functional services to interconnect the entire operating project with the existing steam turbine generator and other existing plant facilities are included in the [REDACTED] scope and will be designed in the FEED study in Phase II. An in-depth study of the existing facility will be performed to determine which portions of the existing plant or specific pieces of equipment from the existing plant can be economically reused for the Oxy-combustion Power Plant Project.

Oxygen supply from the ASU will be considered during Phase II as a contracted service to the plant by an OTF arrangement managed by AL. An OTF arrangement with proper risk-sharing can provide advantages to the project including a more favorable arrangement in the overall plant capital requirement.

## **C. DESCRIPTION OF THE WORK TO BE PERFORMED**

A phase and task list has been developed below. A complete Work Breakdown Structure (WBS) and a detailed task list including associated costs and schedules were developed in Phase I. The Phase I activities have focused on plant design, preparing the necessary technical information required to support all permitting requirements and DOE's NEPA process, and developing a total project cost and schedule. The design established in Phase I is intended to be the final design concept, except for modifications required as a result of the permitting process, the NEPA process, or opportunities that arise to improve the project cost.

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## **1.0 PHASE I – Project Definition and Pre-FEED (10/1/2010 – 10/31/2012)**

The Phase I efforts began upon notification of award of the project by the DOE. The objective of Phase I was to perform the pre-FEED work necessary to establish the initial plant performance estimates, preliminary specifications and component sizes, and initiate project permitting and DOE's NEPA process.

During Phase I, the following key milestones were achieved:

- Project design basis document completed.
- Process flow diagrams and overall mass and energy balances completed.
- Cost estimate with better than -30/+40 percent accuracy completed.
- Financial pro forma model completed.
- Phase II project schedule, including CO<sub>2</sub> Pipeline and Storage Project key milestone tie points, completed.
- Project host site commitment made (legal documents will be signed after DOE concurrence).
- Firm commitments for Phase II cost share obtained.
- Draft CO<sub>2</sub> Off-Take Agreement with the CO<sub>2</sub> Pipeline and Storage Project completed.
- Draft Cooperation and Technology Agreement developed (agreement to be finalized and signed prior to the start of Phase II).
- Draft Power Purchase Agreement (PPA) submitted to the Illinois Power Agency.
- Project Management Plan (PMP) completed.
- Data packages to support the NEPA process completed.
- Phase II – DPA prepared.

The following section summarizes the Phase I tasks. A portion of the tasks described will be completed in Phase ID, which has not been completed.

### **Task 1.0 – Project Management Plan**

The project management and planning effort in Phase I was focused on the key tasks of project team development, site assessment, project budget and schedule development, preparations for submittal of applications for permits and other approvals, and the development of environmental information to support the NEPA process.

Ameren's Project Management Team (Oxy PMT), in cooperation with DOE, developed the initial PMP. The PMP has been and continues to be the guiding document for execution of the project. The PMP will be updated at the end of each phase to reflect: (1) changes in project management policies and procedures; (2) changes in scope, methods, or approaches; (3) changes to the technical, cost, and/or schedule basis of the project; or (4) modifications required to ensure that the PMP is the appropriate governing plan to accomplish the project objectives.

The PMP will be the critical document that integrates how: (1) work is executed to accomplish the project objectives; (2) project risks are considered; (3) the project technical scope, cost, and

schedule are managed; (4) project performance is monitored and controlled; and, (5) project information is communicated within the project team and to DOE, and external stakeholders. DOE will be involved in the development and approval of the PMP and updates in subsequent phases.

The Oxy PMT established the necessary database and protocol during Phase I for the use of earned value management techniques meeting industry standards for tracking completion of work, keeping activities on schedule, and controlling costs to remain within the budget. Activities performed during Phase I were tracked using standard accounting practices consistent with the PMP. In Phase II, earned value management techniques will be initiated and will be used to provide oversight and control throughout the remainder of the project. The Oxy PMT will implement and manage the project and report on activities in accordance with the approved PMP for the total project.

Ameren provided DOE with a baseline PMP within 90 days after the Phase I start date as specified in the cooperative agreement. The PMP describes the integration activities identified above and includes the following:

- i. Executive Summary – succinctly describing the project, background, rationale, goals and objectives.
- ii. Risk Management – identifying significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.
- iii. Project Milestones – listing milestones for each phase of the project, including title, planned completion date and a description of the method/process/measure used to verify completion. Milestones were established for major project deliverables and show progression towards phase and/or project goals.
- iv. Funding and Costing Profile – showing (1) by phase, the total amount of funding including totals and cost share percentages (government funding); (2) budget breakdown in accordance with WBS for each phase; and (3) a project spend plan, by month, for the expenditure of government funds.
- v. Resource-Loaded Schedule and Primavera Files– providing a schedule for the project by phase, which incorporates the WBS and the funding and costing profile. The timeline shows interdependencies and noted the project milestones. Updates were provided to the DOE on a monthly basis.
- vi. Project Management Organization – showing project team membership presented by discipline and organizational hierarchy, listing contact information for each key team member.
- vii. Roles and Responsibilities – delineating members of the project team and for each entity (i.e., government and participating teaming entities).
- viii. Key Personnel – identifying personnel considered essential to a project. Prior to removing or replacing such personnel, the project team agreed to notify DOE so that the impact to the project can be ascertained.
- ix. Work Breakdown Structure – adopting a WBS that allows it to effectively manage and control the work activities. The detail level and type of work breakdown structure for each phase is determined based on the type of work being performed [i.e. task and/or systems]. The WBS is intended to be consistent in the project estimate, project cost

- tracking, and project scheduling system. Cost and schedule performance may be tracked at different levels of the WBS but will roll-up to the appropriate level for performance reporting. At the beginning of each phase, the project team will prepare the WBS for all project activities in the upcoming phase. Once a phase has started, the WBS will not change, unless agreed to by both the recipient and DOE.
- x. Communications – establishing the appropriate exchange of project information within the project team, internal organizational elements, and to external stakeholders including: (1) routine project meetings (e.g., face-to-face, and remote conferencing); (2) design reviews; (3) government review and comment of project-related press releases, conference papers and journal articles; (4) dissemination of project documentation (e.g., engineering drawings, modeling results, equipment lists, test plans, etc.); and (5) briefings to the government.
  - xi. Project Monitoring, Change Control and Process Improvement – clearly showing how: (1) the project will be monitored and changes controlled relative to the technical scope, budget and schedule basis, including changes that affect the project management plan and the cooperative agreement; (2) project variances will be determined, evaluated and documented; (3) steps will be taken to mitigate problems; and, (4) all these processes will be reported. The Alliance will implement these monitoring, change control and process improvement processes to revise and update the PMP when changes: (1) to project management policies and procedures are appropriate; (2) to the technical scope, budget and/or schedule basis are approved; or, (3) are otherwise required to ensure that it is the appropriate governing plan for the work required to accomplish project objectives.
  - xii. Meetings and Project Briefings – providing their frequency during the project period in the PMP. This list includes: project kickoff meeting with DOE (conducted within 70 calendar days after award), annual progress review meetings with DOE, quarterly PMT meetings, design review board meetings, constructability review meetings, start-up review meetings, operational readiness meetings and the end-of-project final review meeting with DOE.
  - xiii. Task-Related Cost Breakdown – starting in Phase II using earned value management principles to integrate budget, cost, work completed, and schedule. The recipient will report actual cost and earned value at a minimum of WBS level 4. In most cases, actual cost and earned value will be reported at WBS level 5, with the exception being situations where the WBS does not logically permit actual costs to be collected at level 5 or, alternatively, where a high percentage of total project costs is associated with a single level 4 or 5 subtask, deliverable or work element. Planned and earned progress will be measured at the lowest levels of the WBS and aggregated up to the appropriate levels for assimilation with actual costs. This process will allow for uniform reporting of standard project performance indices, such as schedule performance index and cost performance index. The recipient shall use planned value, earned value, and actual cost to assess the cost and schedule performance of the project by calculating and reporting the cost performance index and the schedule performance index. The recipient shall provide an analysis of the project performance to date by assessing the cost performance index and schedule performance index.
  - xiv. Technology Cost Data Reporting – For the purposes of understanding the cost of the advanced technologies being demonstrated, the recipient will compile costs associated with the technology with separated project management and reporting costs. This has

been done in the Phase I deliverables. Technology costs have been, and will continue to be, recorded as follows. Based on the costs of oxy-combustion repowering, balance of plant integration and CO<sub>2</sub> capture and delivery to the interconnect point, the recipient will provide to DOE the capital and operating costs (estimated, including percent accuracy, and actual when available) and the total project cost. The costs of any other technologies used in the project that involve DOE cost-shared funding shall be included in this reporting. DOE will use the data internally as part of its project- and program-related due diligence. Additionally, the data may be used, along with other program cost data, as a basis for federal analyses and related cost database development. The updated cost data will be provided no later than 90 days before the end of each project phase identified in the cooperative agreement. The cost data provided by the recipient will include (but not necessarily be limited to):

- a. Task-related cost breakdown. The project team will provide the project budget broken down by WBS levels, i.e., budgeted and actual costs at the deliverable level, rolled up to the subtask level, task, phase, and total project. The total project budget will include personnel (direct labor), fringe rate, travel, equipment, supplies, sub recipients (or subcontractors), consultants, other direct costs, indirect costs (e.g., overhead, general and administrative), and costs associated with maintaining the Meredosia Energy Center in retrofit-ready condition.
- b. Capital and operating cost breakdown (excluding project management and reporting costs) and other costs. In the appropriate phase, the project equipment and material costs, capital costs, and operating costs (budgeted and actual) will be provided:
  - i. The recipient shall provide a list of major equipment and materials (greater than \$25,000) needed for the project, their specifications, and the cost of each piece of equipment under different categories, such as oxy-combustion, balance of plant integration, CO<sub>2</sub> capture, and delivery to the interconnect point. (Example equipment and materials could include: oxygen plant, combustion boiler, compressors, blowers, separation equipment, substation, pumps, reactors, concrete, steel, etc.). The other associated capital costs will be provided in appropriate categories, such as instrumentation and controls, electrical and switchyard, utilities, buildings and structures, balance of plant, site development, engineering, and construction (as applicable to the project) so as to give the complete breakdown of the total capital cost of the project. The associated labor costs (direct and indirect) will be appropriately identified.
  - ii. The operating costs will include fixed and variable costs by categories such as labor, fuel and feedstock, chemicals, and maintenance. Also, any disposal costs for waste materials, etc. will be included.
- c. Project development costs, technology fees, pre-production costs and inventory capital. Project development costs include but are not limited to environmental permitting/characterization costs, legal fees, land costs, and infrastructure improvements such as transmission interconnections, roads and rail lines. Technology fees include prepaid licenses and royalties. Pre-operation costs will include operator training, equipment checkout and startup and commissioning costs. Inventory capital includes spare parts, stored feedstocks (fuels and other

consumables stored on-site), and first fills of chemicals and catalysts within process plant vessels.

- d. Project finance structure, along with costs associated with arranging financing and the cost of interest during construction.
- e. Budgeted costs (identify the basis, e.g., overnight, date) and actual costs. The source of cost data will be adequately referenced, e.g., verbal quotes, written quotes, catalog price, engineering estimate, historical cost, current invoice, or other basis. Explain how escalation has been considered in the budget.

At the end of each phase, these data are shared with the DOE Program Manager/Project Officer. The government will use the data internally as part of its project- and program-related due diligence. Additionally, the data may be used, along with other program cost data, as the basis for federal systems analyses resulting in public reports. The information published in these reports will be presented in a manner that cannot be connected to a specific firm, project, or technology.

### **Subtask 1.1 – Project Team Development**

Finalize Key Project Participants – To assure the successful completion of the large-scale test, the PMT incorporated individuals from key project stakeholders, including:

- Power Plant Owner
- Plant Operators
- Architect-Engineer
- Technology Developers
- Construction Firms

As part of good project team alignment practices, the PMT held regular meetings and coordination conference calls to establish project actions and follow-ups.

### **Subtask 1.2 – Agreements and Permits**

The PMT initiated discussions with the appropriate parties regarding:

- Fuel Supply
- PPA(s)
- CO<sub>2</sub> off-take from the plant
- Cooperation and Technology Agreement with team members
- Midwest Independent Transmission System Operator (MISO) studies
- Illinois Finance Authority

### **Subtask 1.3 – Stakeholder Outreach**

Coordination and communication with the CO<sub>2</sub> Pipeline and Storage Project is critical throughout the project. Ameren worked with the team members of the CO<sub>2</sub> Pipeline and

Storage Project to identify the communication and technical leads for both projects and developed a strategy for engaging stakeholders and for communication in general, including media outreach.

The objective of the stakeholder outreach activity is to:

- To engage affected stakeholders in the State of Illinois to educate them on near-zero emission coal-fueled power and the project;
- To provide information to these stakeholders and understand their issues and concerns; and
- To communicate regionally, nationally, and globally with non-government organizations, academics, industry, governments, and other stakeholders in order to explain the project, build support for its objectives, and resolve concerns early.

#### **Subtask 1.4 – Maintain Required Meredosia Assets in Retrofit-Ready Condition**

On December 31, 2011, Ameren closed the Meredosia Energy Center, which is a development not anticipated when FutureGen 2.0 was launched. To preserve the viability of the project, Ameren, as a support contractor to the Alliance, will maintain the Meredosia Energy Center in retrofit-ready condition in preparation for the FutureGen 2.0 repowering. These retrofit-ready activities include but are not limited to: (1) maintenance of the building and grounds, (2) maintenance and layup of the Unit 4 steam turbine generator set and other assets to be used in the repowering in Phase III, (3) providing auxiliary power to provide heat within the powerhouse building, (4) local real estate taxes, (5) insurance premiums, (6) maintenance of permits, and (7) security services.

#### **Task 2.0 – Plant Design and Engineering**

The PMT developed a project design that can be integrated into the existing Meredosia Energy Center. Engineering evaluations were made to determine the amount of existing equipment that can be economically incorporated into the project. A list of new equipment required to support the repowering effort was generated. Preliminary engineering work for the boiler, GQCS, ASU, CPU, and balance of plant equipment will be done to develop engineering, equipment, construction and other information to support the development of the project cost estimate and project schedule as outlined in Task 3.0 and to satisfy preliminary permitting and NEPA information requirements.

#### **Task 3.0 - Cost Estimate and Schedule Development**

Project costs for Phase I were compiled in accordance with the PMP requirements including a task cost breakdown showing budget costs at the sub-task level including: (1) technology costs, (2) plant capital and operating cost showing breakdowns by major system components, variable costs by category; (3) technology fees, pre-production costs and inventory costs; and (4) project development costs by project team member.

**Subtask 3.1 Budgetary Estimate**- A project cost estimate (with higher certainty than the required -30/+40 percent) (capital expense and operating expense) will be generated.

**Subtask 3.2 – Project Economic Evaluation** - Evaluation of the project economics were monitored throughout Phase I during regularly scheduled reviews of project capital and operating cost estimates, project schedule, funding commitments and risk/opportunity assessments. The results of these reviews were, and will continue to be, used to update the project financial model and analyze their impact on the total project economics.

**Subtask 3.3 – Preliminary Schedule**- A preliminary project schedule was developed. It will be updated throughout the project as additional detail and accuracy of the engineering, procurement, construction, commissioning and testing plans are developed. Regularly scheduled updates were provided to the DOE throughout Phase I and significant variances from the preliminary estimate were identified. Value engineering reduced part of the unexpected variances and the remaining capital variances are resolved in the funding plan submitted with the application (at no additional government expense). As it is critical to the successful completion of FutureGen 2.0, the preliminary project schedule was and will continue to be coordinated with key CO<sub>2</sub> Pipeline and Storage Project milestones and anticipated common tasks. Project scheduling is particularly important for NEPA and permitting activities as the NEPA process will view both the oxy-combustion project and the CO<sub>2</sub> storage project as connected actions. Also, final design (which will occur in the latter part of Phase II) cannot begin until DOE completes its NEPA process with the issuance of a record of decision.

**Subtask 3.4 – Project Risk and Opportunity Assessment** - As the plant configuration and equipment designs were developed, a Project Risk and Opportunity Management Plan was developed, mitigation strategies identified and incorporated and financial impacts quantified. The completed plan includes a listing of both risk/opportunity events and a mitigation/capitalization plan. Preliminary quantitative cost/schedule assessments are also included. This assessment will be continually updated over the life of the project.

#### **Task 4.0 Development of DOE Reporting Documents**

**Subtask 4.1 – Budget Reporting/Invoicing** - Project status reporting, cost tracking and invoicing procedures to support execution of the DOE cooperative agreement throughout the project were developed during Phase I by the PMT.

**Subtask 4.2 – Technical Reports** - Technical reports addressing specific topics of importance to the project were prepared (e.g., the topical technical report).

#### **Task 5.0 – Preliminary Permitting and NEPA**

The project team has prepared the groundwork for, and where appropriate submitted, the permit applications and support the NEPA process local, state, and federal permitting authorities will be contacted and appraised of the intended nature of facility upgrades.

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**Subtask – 5.1 Permits** -The project completed and submitted:

- Air construction permits
- Water permit
- Revision to the National Pollution Discharge Elimination System (NPDES) Operating Permit
- Transmission Interconnect Feasibility Study (i.e., MISO study)

Additional permit requirements, which were assessed and will be addressed in Phase II include:

- Construction Permits
- Waste Permits
- FAA Title 14 Clearance Application
- Spill Prevention, Control and Countermeasures Plan
- U.S. and Illinois Department of Transportation Permits
- Special Use Permits
- Revision to Title V Operating Permit (Illinois Clean Air Act Permit Program)
- Certificate of Public Convenience and Necessity
- Additional MISO studies

This project team proactively briefed regulatory agencies on the project plans and will continue to proactively engage and respond to questions and comments from the various regulatory agencies promptly and appropriately. Permits will be coordinated with the CO<sub>2</sub> Pipeline and Storage Project where appropriate. The PMT will also work with the regulatory agencies to plan and conduct public hearings as part of any of the required plant permits.

**Subtask 5.2 - Environmental Information Volume** – The PMT prepared and provided incremental data packages containing information regarding the power plant to support DOE’s NEPA process. Together, the data packages make up the Environmental Information Volume (EIV) for the project. Updates were provided when additional information became available.

**Subtask 5.3 - Affected Community Survey** - An Affected Community Survey was planned by Ameren, but not performed due the Ameren decision not to proceed. The Alliance has added Meredosia representatives to the FutureGen 2.0 Citizen’s Board and, while the Alliance may not conduct a formal survey, it will proactively engage the community.

**Task 6.0 – Decision Point Application (for Phase II)**

In accordance with the provisions of the cooperative agreement, the following must be completed before DOE authorizes funding for Phase II:

- DPA, which has been submitted to DOE review.

- Firm commitments for the recipient's cost share requirements for Phase II consisting of a financial plan, financial commitment letter(s), and a pro forma model, all of which have been submitted for DOE review.
- Executed Cooperation and Technology Agreement with team members of both FutureGen 2.0 projects, which has been submitted to DOE in draft form with a final agreement to be consummated prior to the start of Phase II.
- Draft PPA(s), which has been completed and submitted to the Illinois Power Agency (IPA).

**Subtask 6.1** – Consistent with the Topical Report format and instructions prescribed under the Reporting Requirements Checklist, Ameren has prepared and submitted a detailed Topical Report discussing the technical results of the work performed under the Phase I SOPO tasks. This report is included as part of the DPA – Phase II. In addition, the Alliance, with support from Ameren, submitted the DPA – Phase II to the DOE Program Manager/Project Officer and the DOE Contract Specialist. The DPA includes the information identified in the following subtasks.

**Subtask 6.2** – A report on the recipient's progress towards meeting the objectives of the project, including significant findings, conclusions, or developments. Specific discussion and quantitative analysis (when applicable) is made regarding progress toward completion of key milestones identified for each project phase within this SOPO.

**Subtask 6.3** – A description of the recipient's plans for the conduct of the project during the upcoming phase. These plans include:

**Subtask 6.3.1** – An updated SOPO that defines all work to be performed under Phase II, showing detail at WBS Level 5, including detail for tasks and subtasks in all remaining phases of the project.

**Subtask 6.3.2** – A detailed budget and supporting justification for Phase II. DOE requested that the budget identify if additional funds are requested or a reduction of funds is anticipated. The Alliance is not requesting additional government funds for the project beyond the existing approximately \$590 million to the project. Also included, is a summary of cash and in-kind contributions; although no in-kind contributions are offered at this time.

**Subtask 6.3.3** – An updated PMP including the WBS; Project schedule and milestone list; a Baseline Cost Plan on a monthly basis; a description of the project management system for monitoring and controlling scope, schedule, and cost including the plan for reporting earned value; a Project Communication Protocol; and a Risk Management Plan.

**Subtask 6.3.4** – An updated Project Funding Plan for the remainder of the project, showing sources and uses of funds.

**Subtask 6.3.5** – For each source of funding, audited financial statements for the last three years and any available financial statements for the current year.

**Subtask 6.3.6** – An updated financial model of the project, including a statement of revenues and expenses (income statement), balance sheet, and cash flow statement.

**Subtask 6.3.7** – A financial commitment letter from each funding source.

**Subtask 6.3.8** – An updated plan for executing the PPA, the CO<sub>2</sub> Off-Take Agreement, and contracts with project team partners and vendors are included. It is required that the recipient describes its plan for compliance with Davis-Bacon Act requirements; however, there are no construction activities in Phase II covered by Davis-Bacon. However, a project-wide Davis-Bacon plan will be developed in Phase II for Phase III.

**[End of Phase I]**

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**THIS SECTION (PAGES 15 -24) DESCRIBES PROJECT OBJECTIVES DURING A CONDITIONAL SUB-PHASE IIA, APPROVED FEBRUARY 1, 2013**

**DESCRIPTION OF THE WORK TO BE PERFORMED IN CONDITIONAL SUB-PHASE 2A**

A phase and task list has been developed below. A complete Work Breakdown Structure (WBS) and a detailed task list including associated costs and schedules were developed in Phase I. The Phase I activities focused on plant design, preparing the necessary technical information required to support all permitting requirements and DOE's NEPA process, and developing a total project cost and schedule. The design established in Phase I is intended to be the final design concept, except for modifications required as a result of the permitting process, the NEPA process, or opportunities that arise to improve the project cost.

**2A.0 Conditional Sub-Phase 2A – NEPA, Permitting, and Design**

The objectives of the Oxy-combustion Project will be achieved as outlined in the SOPO submitted with the BAF dated October 5, 2012. This document specifies what critical activities that will be performed during the conditional Sub-Phase 2A period Feb 4<sup>th</sup> through April 1<sup>st</sup>, 2013. Conditional Sub-Phase 2A is designed to advance the following key milestones:

- Continue to support efforts to implement the PPA.
- Obtain all required environmental permits and other permits and licenses required for financial close and start of construction.
- Advance preliminary design (FEED) efforts.
- Advance DOE negotiations for a bilaterally acceptable liquidated damages clause.
- Support efforts to obtain commitments for all sources of funds including Alliance equity, additional equity, and project debt.

**Task 7.0 – Project Development and Management**

This task will be lead by the Alliance project manager, a team of project developers and engineering and construction staff and supported by the Alliance owner engineer, URS. The task includes the following:

- PMP
- Commercial and financial activities
- PPA
- MISO interconnection application
- Teaming and contracting activities
- NEPA and permitting support
- Local government and stakeholder activities

- Administrative, legal, and consulting support.

Included under this task are the following cost codes:

- Level of Effort Support & Project Management

Document Control	200.UE.PMT.61.01
Project Engineering Manager	200.UE.PMT.61.05
Project Management	200.UE.PMT.61.51
Planning & Scheduling	200.UE.PMT.61.54
Project Secretarial	200.UE.PMT.61.55
Project Cost Analyst	200.UE.PMT.61.56
Project Controls Supervision	200.UE.PMT.61.58

- Engineering Support

Mechanical	200.UE.PMT.61.15
Process	200.UE.PMT.61.21

Each of these is addressed below.

### **Subtask 7.1 – Project Management Plan**

The Phase I PMP will be updated to reflect any changes identified in cost or schedule during the Phase I activities. The DOE Project Officer will be apprised of all changes that have occurred from the Phase I PMP.

### **Subtask 7.2 – Project Management and Controls**

This task includes project management and project controls to maintain financial and schedule oversight and control of the project. Supported by URS in a project management role, the Alliance will utilize earned value management techniques meeting industry standards for tracking completion of work, keeping activities on schedule, and controlling costs to remain within the budget. The Alliance will implement and manage the project and reports on activities in accordance with the approved PMP, which will be revised throughout the phases of the project.

### **Subtask 7.3 – Technical Reporting and Coordination**

With support from URS, the Alliance will prepare and submit reports and deliverables as required in the Financial Assistance Reporting Requirements Checklist and this SOPO. URS will also coordinate the preparation of technical reports, such as technology cost reports, cost estimate roll-ups, topical reports, and technical papers.

### **Subtask 7.4 – Commercial and Financial Activities**

**Subtask 7.4.0** – Commercial Contracts Development. The Alliance, supported by consultants and legal specialists, will create, negotiate, and complete key contracts required to close financing. Those include, but are not limited, to EPC contracts, O&M contracts, Commissioning /Performance Testing (system-wide) contracts, Oxygen/Gases Supply, Coal Supply, Ash Disposal, CO<sub>2</sub> sale to Transport/Storage Entity, Sale of Site Assets, etc. These activities are scheduled to begin promptly at the start of Sub-Phase 2A and continue throughout Phase 2 to meet timely completion dates needed to support the financing process.

**Subtask 7.4.1.** – Financial Model. The Alliance, supported by PKM Energy, will update and amend as required the existing project financial model as capital and operating cost estimates are advanced and the business and financing structures are improved. The updated financial model will include income (revenues and expenses), cash flow and balance sheet statements that reflect the Alliance’s business and financing structure, and DOE’s cost share agreement for the oxy-combustion project. Sensitivity and variance analysis will be performed as needed.

**Subtask 7.4.2.** – Project Financing. Working with its financial advisors, XMS Capital Partners and PKM Energy, the Alliance will begin arrangements for the third-party non-recourse project financing. The financing is required to supplement the American Recovery and Reinvestment Act (ARRA) funding from DOE. Raising debt financing will include identification of the most efficient sources of capital for the project (most likely banks), educating and negotiating with the financial institutions regarding the structure and terms of the debt capital, and managing a competitive process to raise the most attractively priced financing for the project.

The financing activities will also include securing the necessary equity capital for the oxy-combustion project. While it is currently envisioned that the Alliance members will contribute some or all of the required equity capital, this effort will be closely coordinated with the non-recourse project financing. Other sources of equity capital may also be considered.

## **Subtask 7.5 – Power Purchase Agreement**

**Subtask 7.5.1.** – Developing PPAs. The Alliance, supported by its legal counsel (Van Ness Feldman and McGuireWoods), financial advisors (XMS Capital Partners), and commercial and financial consultant (PKM Energy) the Alliance will complete the negotiation of and gain necessary regulatory approval(s) for PPAs with Commonwealth Edison, Ameren Illinois, and the alternative retail energy suppliers. Since the PPAs will provide the required revenue stream to support the proposed third-party non-recourse project financing, the Alliance will ensure that the PPAs are financeable contracts.

The Alliance will ensure that the costs for the transportation, injection, and storage of the CO<sub>2</sub> are properly reflected in the cost-of-service formula rate being developed for the PPAs required to support the proposed third-party non-recourse financing of the oxy-combustion power plant project portion of the FutureGen 2.0 Project. Because the CO<sub>2</sub> Services Agreement will likely be considered a material contract necessary for the financing, the Alliance will work with its financial and legal advisors to ensure that the CO<sub>2</sub> Service Agreement meets all lender requirements.

#### **Subtask 7.6 – MISO Interconnection Application**

The Alliance, supported by Patrick Engineering, will continue the process of obtaining a MISO Generator Interconnection Agreement to place the power generated by the oxy-combustion power plant on the existing transmission grid. Working with electrical engineers from Patrick Engineering, the Alliance submitted an application for generator interconnection to MISO and work with MISO throughout its conduct of a required feasibility study and a system impact study. The Alliance and/or its subcontractors will also attend meetings with MISO as requested to address questions and study results.

#### **Subtask 7.7 – Teaming and Contracting Activities**

The teaming and contracting activities for Sub-Phase 2A are designed to support the timely preparation and acquisition of documents required to close financing on schedule. This will require an overlapping schedule beginning with development of definitive terms and conditions early in Phase 2 which will be fed by final design, performance data, and cost estimates at the 30-40 percent engineering complete level, and then negotiation of all key contracts completed in time to escrow those contracts in the data room in order for investors to perform their due diligence. Because of the unique status of oxy-combustion technology, Phase 2 will complete up to 90 percent of the definitive and final engineering and design definition and pre-construction procurement contracts, providing a high level of confidence in the performance and reliability of the project and to accelerate the construction schedule in Phase 3.

**Subtask 7.7.1. – Teaming Agreements.** During Sub-Phase 2A, the Alliance will update and sign teaming agreements with URS as the Owner’s Engineer, B&W, and AL to establish clear alignment on the Phase 2 and Phase 3 execution philosophy. The teaming agreement will establish common goals and ensure open book, transparent sharing of data to achieve those common goals. Support from legal counsel will be required.

**Subtask 7.7.2. – EPC Contracts.** The Alliance will begin development and potentially start negotiations of the following EPC contracts during Sub-Phase 2A:

1. [REDACTED] EPC Contract for the entire Oxy-combustion Power Plant Project excluding only the ASU and CPU. This contract will include the sub-

recipient scope and the balance of plant scope. [REDACTED]

2. AL EPC Contract for the ASU including the option for ALLLI to acquire the ASU and operate the ASU and supply oxygen and other services “over the fence”.
3. AL EPC Contract for the CPU. AL Process and Construction will be the EPC contractor for this proprietary technology and sub-recipient scope.
4. Commissioning and Performance Testing Contract. The EPC contracts will include firm pricing and date certain obligations ending with achieving “Ready to Test” conditions. Since investors will require a system-wide test of the integrated BW and AL designed facilities, a contract between the Alliance and the EPC contractors will be required to pay for and manage the commissioning and performance testing of the complete system. This contract will likely include incentives to achieve guaranteed performance standards and penalties if such standards are not achieved.

In order to meet the financing schedule, the terms and conditions of these contracts will be negotiated during Sub-Phase 2A and be in place by the time 30-40 percent of the engineering is completed and firm prices and other commercial metrics are read to populate the contract and exhibits. Substantial support from legal counsel will be required. The Alliance has retained top counsel from Latham and Watkins to help expedite this process.

#### **Subtask 7.7.3. – Materials and O&M Contracts**

**Material Contracts.** The Alliance will develop and execute contracts for fuel, CO<sub>2</sub> sales, ash disposal, and oxygen supply (if needed). These contracts are scheduled to be completed midway through Phase 2 so they can be escrowed with the potential investors and due diligence can begin.

**Operations and Maintenance Contracts.** The Alliance will negotiate an O&M contract with a B&W subsidiary to operate the plant except for the ASU and CPU, which will be operated by AL. Substantial support legal counsel will be required. Latham and Watkins and Van Ness Feldman will provide that support.

**Subtask 7.7.4. – Cost- and Performance-Related Reviews.** Using the services of Hensley Energy Consulting, the Alliance will perform engineering design reviews for the B&W oxy-combustion island and the AL CPU. Hensley Energy Consulting will also support the Alliance in the negotiation of the above contracts as needed.

#### **Subtask 7.9 – NEPA and Permitting Support**

**Subtask 7.9.1.** – NEPA Support. The Alliance will continue to support DOE’s NEPA process, using the services of Lucinda Low Swartz as the Alliance’s lead for NEPA support. The Alliance will obtain and provide requested information in a timely manner, provide comments on preliminary sections of the environmental impact statement (EIS), participate in public hearings on the draft EIS, prepare responses to comments received on the draft EIS, provide a revised environmental and design data for the oxy-combustion power plant project, support the preparation of a final EIS, and review a draft DOE record of decision. The Alliance will coordinate the input from the other project partners to DOE’s NEPA process.

**Subtask 7.9.2.** – Environmental Permitting. In Phase I, Ameren (in cooperation with the Alliance) submitted air and water permits to IEPA. In Sub-Phase 2A, the Alliance will work with Ameren to revise the permit applications to reflect design changes in the project and address any questions or requests for additional information regarding the permit applications. The Alliance will also participate in any public hearings with respect to the requested permits. The project environmental and construction permit process will continue following the successful completion of the NEPA EIS.

#### **Subtask 7.10 – Local Government and Stakeholder Activities**

The Alliance, supported by its Illinois counsel McGuireWoods, will engage local elected officials in Morgan County regarding the project and work to advance the development of a real estate tax agreement. The Alliance will also undertake community outreach activities relating to the Oxy-combustion Power Plant Project.

#### **Task 8.0 – FEED and Final Design**

DOE’s NEPA review and the Alliance’s permitting efforts are intended to proceed in parallel with the FEED process.

The design effort in Sub-Phase 2A will be conducted in two steps (FEED and final design). FEED will bring the design to 30 – 40 percent, at which point the FEED results will be sent to the cost estimating team.

Sub-Phase 2A design will be focused on: (1) development of plant and equipment designs; (2) development of specifications for procurement of material, equipment, and construction services; and (3) preliminary procurement efforts including partial or conditional awards to select vendors limited to obtaining certified vendor engineering to allow the detailed engineering deliverables to advance to approved for construction status (the release of material or fabrication will not occur until Phase 3).

#### **Subtask 8.1 – Design Study**

URS, as the Alliance’s Owner’s Engineer, will have a substantial role in supporting the Alliance project manager in the execution of the design, including detailed technical reviews, quality assurance, and assuring technical integration between the project partners.

**Subtask 8.1.1 – Steam Generator Island including Gas Quality Control Equipment (BW PGG)**

**Subtask 8.1.1.1 – Boiler and GQCS Project Management Services and Support.** This subtask will include the ‘Level of Effort’ components of the B&W Project Team including the following cost codes:

Project Manager – Boiler	200.BW.B10.61.ZP.1100
Project Engineers – Boiler	200.BW.B10.61.ZP.1400
Project Accounting	200.BW.B10.61.ZP.1500
Project Procurement Manager - Boiler	200.BW.B10.61.ZP.1900
Project Manager – GQCS	200.BW.B20.61.ZP.1100
Project Procurement Manager - GQCS	200.BW.B20.61.ZP.1900
PM Travel – GQCS	200.BW.B20.61.ZP.7000

The “Level of Effort” members of the Boiler/GQCS Project Team will not directly produce hard deliverables, but will play a vital role in project development and execution. Project Managers will compile and transmit the periodic reports that are required, participate in and/or lead internal and external meetings, and serve as the primary interface between the other principal participants of the FutureGen project. Project Schedulers maintain and update the Primavera schedule utilized by the project team. Project Engineers are the key inter-discipline technical interface within B&W as well as with other members of the FutureGen team. Project Procurement Managers are responsible for the interface between B&W and the sublet vendors and will transmit Request for Quotation documents, compile vendor bid evaluations, and negotiate vendor terms and conditions.

**Subtask 8.1.1.2 – Boiler and GQCS Technical Activities (BW PGG)**

Performance and Functional Design (Air and Oxy-fired) - The comprehensive heat and mass balance for the steam generator island defining all required inputs and byproduct streams under various load conditions when firing with air and when in oxy-firing mode will begin to be updated from the Phase I design. Included under this subtask are the following cost codes:

Sublet Architect Engineer- Boiler	200.BW.B10.61.ZE.1000
GQCS Functional Design/Perf	200.BW.B20.61.ZE.2000
Boiler Technology	200.BW.B10.61.ZE.5000
Boiler Tech Design/Graphics	200.BW.B10.61.ZE.4000
GQCS Tech Design/Graphics	200.BW.B20.61.ZE.4000
Boiler Inst/Elec/Controls	200.BW.B10.61.ZE.6000

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### **Subtask 8.1.2 –Air Separation Unit Definition (ALPC)**

Several strategies will be evaluated in Phase 2 to determine the most economic design and arrangement for supply of oxygen to the plant. Regardless of the final arrangement for supply of oxygen to the plant, it is recognized that the operation of the ASU is integral to the overall performance of the oxy-combustion process. The design of the ASU will be fully integrated into the design of the project to have the greatest positive impact on overall plant cost and efficiency. Some of this work may begin in Sub-Phase 2A.

#### **Subtask 8.1.2.1 –ASU Project Management Services and Support.**

This subtask will include the “Level of Effort” components of the AL Project Team including the following cost codes:

Project Management Support	200.AL.ASU.61.50
Other Management Support	200.AL.ASU.61.60
Project Engineering	200.AL.ASU.61.05
Project Management	200.AL.ASU.61.51
Administrative	200.AL.ASU.61.52
Document / Data Control	200.AL.ASU.61.01
Estimating	200.AL.ASU.61.53
Project Cost Control	200.AL.ASU.61.56
Project Scheduling	200.AL.ASU.61.54
Construction Support/HSES	200.AL.ASU.61.63
Startup & Commissioning Support	200.AL.ASU.61.33

The “Level of Effort” members of the ALPC Project Team will not directly produce hard deliverables, but will play a vital role in project development and execution. Project Managers will compile and transmit the periodic reports that are required, participate in and/or lead internal and external meetings, and serve as the primary interface between the other principal participants of the FutureGen project. Project Schedulers will maintain and update the Primavera schedule utilized by the project team. Project Engineers are the key inter-discipline technical interface within ALPC as well as with other members of the FutureGen team. Project Procurement Managers are responsible for the interface between ALPC and the sublet vendors and will transmit Request for Quotation documents, compile vendor bid evaluations, and negotiate vendor terms and conditions.

#### **Subtask 8.1.2.2 – ASU Technical Activities (ALPC)**

Performance and Functional Design (Air and Oxy-fired) - The comprehensive heat and mass balance for the ASU island defining all required inputs and byproduct streams under various load conditions when firing with air and when in oxy-firing mode will begin to be updated from the Phase I design. Included under this subtask are the following cost codes:

Process Engineering	200.AL.ASU.61.21
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Systems Design	200.AL.ASU.61.22
Civil / Structural Design	200.AL.ASU.61.12
Mechanical Design	200.AL.ASU.61.15
Controls Systems	200.AL.ASU.61.20
Piping Design / Stress	200.AL.ASU.61.16
Electrical Engineering	200.AL.ASU.61.17
E&I Design	200.AL.ASU.61.19

### **Subtask 8.1.3 – CO<sub>2</sub> Compression and Purification Unit Definition (ALPC)**

Work may begin to identify strategies to determine the most economic arrangement of the CO<sub>2</sub> CPU for the plant. The operation of the CPU will be integral to the overall performance of the oxy-combustion process and the design of the CPU will be fully integrated into the design of the project to have the greatest positive impact on overall plant cost and efficiency.

#### **Subtask 8.1.3.1 CPU Project Management Services and Support.**

This subtask will include the “Level of Effort” components of the AL Project Team including the following cost codes:

Project Management Support	200.AL.CPU.61.50
Other Management Support	200.AL.CPU.61.60
Project Engineering	200.AL.CPU.61.05
Project Management	200.AL.CPU.61.51
Administrative	200.AL.CPU.61.52
Document / Data Control	200.AL.CPU.61.01
Project Cost Control	200.AL.CPU.61.56
Project Scheduling	200.AL.CPU.61.54
Construction Support/HSES	200.AL.CPU.61.63

The “Level of Effort” members of the ALPC Project Team will not directly produce hard deliverables, but will play a vital role in project development and execution. Project Managers will compile and transmit the periodic reports that are required, participate in and/or lead internal and external meetings, and serve as the primary interface between the other principal participants of the FutureGen project. Project Schedulers will maintain and update the Primavera schedule utilized by the project team. Project Engineers are the key inter-discipline technical interface within ALPC as well as with other members of the FutureGen team. Project Procurement Managers will be responsible for the interface between ALPC and the sublet vendors and will transmit Request for Quotation documents, compile vendor bid evaluations, and negotiate vendor terms and conditions.

#### **Subtask 8.1.3.2 – CPU Technical Activities (ALPC)**

Performance and Functional Design (Air and Oxy-fired) - The comprehensive heat and mass balance for the CPU island defining all required inputs and byproduct streams under various load conditions when firing with air and when in

oxy-firing mode will be begin to be updated from the Phase I design. Included under this subtask are the following cost codes:

Process Engineering	200.AL.CPU.61.21
Systems Design	200.AL.CPU.61.22
Civil / Structural Design	200.AL.CPU.61.12
Mechanical Design	200.AL.CPU.61.15
Controls Systems	200.AL.CPU.61.20
Piping Design / Stress	200.AL.CPU.61.16
Electrical Engineering	200.AL.CPU.61.17
E&I Design	200.AL.CPU.61.19

### **Task 11.0 – NEPA, Project Permits, Community Surveys (Alliance)**

The NEPA review and project permitting will proceed in parallel with Tasks 8.0 and 9.0.

#### **Subtask 11.1 – Project Permits**

The Alliance will begin efforts to secure all the necessary permit approvals for construction and operation of the project. The following cost code is included:

FutureGen 2.0 Phase II - Environmental Services	002.UE.BOP.61.31
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The permits approvals needed may include:

- Air Permits
- Water and Waste Water Permits
- U.S. Environmental Protection Agency (EPA) Title IV Acid Rain Permit
- Solid Waste Disposal Industrial Landfill Permit (if required)
- NPDES Industrial Storm Water Permit and Storm Water Management Plan
- NPDES Industrial Waste Water Discharge Permit (if required)
- Permit to Construct Public Water Supply
- Spill Prevention, Control and Countermeasures Plan for Operation
- Miscellaneous Utility and Access Right-of-Way Permits
- Other required approvals

[End of Conditional Sub-Phase 2A]

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## 2.0 Phase II – NEPA, Permitting, and Design

During Phase II, the Alliance will design, engineer, permit, contract and complete all the documents required to bring the Oxy-combustion Project to a close of financing and ready to release full field construction. Phase II is designed to complete the following key milestones:

- Secure executed PPA(s) with Illinois utilities and Alternative Retail Electric Suppliers and/or secure a financially equivalent tariff as a mechanism to implement the PPA.
- Execute CO<sub>2</sub> Off-Take Agreement between the Alliance power plant and the Alliance CO<sub>2</sub> transportation and storage entity.
- Obtain all required environmental permits and other permits and licenses required for financial close and start of construction.
- Obtain necessary commitments from Ameren for the power project host site and sale of assets required for financial close
- Negotiate and execute all Phase III technical service contracts, including Engineering, Procurement, and Construction (EPC) contracts for the entire power plant project (excluding the ASU and CPU) [REDACTED] and BWPGG, separate EPC contracts with AL or ALLLI for the ASU and CPU, Operations and Maintenance (O&M) contracts with [REDACTED] for the Power Plant Project (excluding the ASU and CPU) and with AL for the ASU and the CPU.
- Execute a Commissioning and Performance Testing Contract between the Alliance and its EPC contractors as required for close of financing.
- When total project engineering is about 30-40 percent complete, develop a definitive cost estimate for each of the EPC contractor's scope of work through "ready to test" conditions in adequate detail to negotiate final fixed price, date certain EPC contracts.
- Obtain site construction project labor agreements suitable for the EPC contractors to prepare firm proposals to the Alliance for executable EPC contracts.
- Following completion of the executable EPC contracts, the contractors will continue to complete final engineering, procurement, purchase orders, etc. such that about 90 percent of the entire project engineering design and key equipment purchase orders are complete and ready for release at close of financing.
- Complete detailed Phase III project schedule consistent with the negotiated EPC contracts.
- Complete DOE negotiations for a bilaterally acceptable liquidated damages clause
- Obtain firm and final commitments for all sources of funds including Alliance equity, additional equity, and project debt and close financing for full release of Phase III construction.
- Submit Phase III DPA and obtain DOE approval and execution of Phase III in time to close financing and meet the commercial operations dates described below.

Work products developed during Phase II from each of the Phase II EPC contractors are detailed in the Phase II contracts. A partial listing is summarized below:

- Final Project Geotechnical Investigation Analysis and Report

- Final Project Survey (aboveground and underground)
- Final Project Design Criteria Document
- Demolition Drawings
- Site Clearing and Grubbing Plans
- Site Excavation and Grading Plans
- Overall Plant Performance Estimates for several operating cases for various coal blends, ambient conditions, turndown and part load, peak load conditions, etc.
- Heat and Material Balances reflecting all streams within and between the Oxy-combustion boiler, CPU, ASU and balance of plant in tabular form with stream quantities, compositions, conditions for each numbered stream.
- Process and Instrument Diagrams (P&ID)
- Electrical and Mechanical Interface Lists
- Equipment Lists
- Electrical Load Lists (rated and actual load for each operating case)
- Water Balances (raw, treated, and waste water)
- Steam Balances (including steam, boiler feed water, condensate, make ups, etc.
- General Arrangement Drawings
- Building/Enclosure Drawings
- Underground Drawings (electrical and piping)
- Electrical Grounding Plans
- Electrical Power and Control Wiring Plans
- Area Classification Drawings
- Electrical One-Line Diagrams
- Piping Material Specifications
- Piping Orthographic Drawings
- Piping Line List
- Valve Lists
- Piping Specialty Items List
- Instrument Lists
- Control System Architecture Drawings
- Material Take-Offs
- Fabrication and Installation Specifications
- Equipment and Material Specifications and Procurement Packages
- Subcontract bid packages
- Codes and standards

#### Commercial Deliverables

- Basis of Cost Estimate
- Detailed Cost Estimate including summary sheet with Material, Labor, Labor Hours, Subcontracts, Equipment, all directs and indirects, following the form in the EPC contracts. Estimates to include back-up documents

such as major equipment bids, subcontractor bids, etc. Estimate to be in sufficient detail to conduct open book review by Alliance and its Owner's Engineer and consultants. Estimate to include contingency analysis, risk analysis, fees.

- Estimate of Commission and Performance Testing Costs in similar detail as construction cost estimate.
- Estimates for O&M cost in sufficient detail for Alliance consultants review and basis for O&M contract negotiations.
- Commercial proposal for EPC contracts including terms, conditions, firm prices, schedule to "Ready to Test" conditions including guarantees and warranties.
- Commercial proposal for O&M contract including pricing, warranties and guarantees.

The cooperative agreement includes deliverables that the Alliance, BW, and AL will provide to DOE in the event certain "circuit breakers" are triggered leading to early termination of Phase II. Those deliverables are described in the Assistance Agreement.

### **Task 7.0 – Project Development and Management**

This task will be lead by the Alliance project manager, a team of project developers and engineering and construction staff and supported by the Alliance owner engineer, URS. The task includes the following:

- PMP
- Commercial and financial activities
- PPA
- MISO interconnection application
- Teaming and contracting activities
- Power plant architectural design
- NEPA and permitting support
- Local government and stakeholder activities
- Administrative, legal, and consulting support.

Included under this task are the following cost codes:

- Level of Effort Support & Project Management

Document Control	200.UE.PMT.61.01
Project Engineering Manager	200.UE.PMT.61.05
Project Management	200.UE.PMT.61.51
Estimating	200.UE.PMT.61.53
Planning & Scheduling	200.UE.PMT.61.54
Project Secretarial	200.UE.PMT.61.55
Project Cost Analyst	200.UE.PMT.61.56

Business Management	200.UE.PMT.61.57
Project Controls Supervision	200.UE.PMT.61.58
EPC, O&M Contract Development	200.UE.PMT.61.83
Commercial Contracts (coal, CO <sub>2</sub> , oxygen, ash)	200.UE.PMT.61.71
• Engineering Support	
Civil	200.UE.PMT.61.12
Structural	200.UE.PMT.61.13
Mechanical	200.UE.PMT.61.15
Piping	200.UE.PMT.61.16
Electrical	200.UE.PMT.61.17
Instrumentation	200.UE.PMT.61.19
Process	200.UE.PMT.61.21
• Field Support	
Owner Site Construction Manager	200.UE.PMT.31.01
Project Controls Manager	200.UE.PMT.31.04
Quality Oversight	200.UE.PMT.31.08
Safety Oversight	200.UE.PMT.31.09
Yard/Civil Coordinator	200.UE.PMT.31.02
Piping Coordinator	200.UE.PMT.31.02
Mechanical/Millwright Coordinator	200.UE.PMT.31.02
Electrical/I&C Coordinator	200.UE.PMT.31.02
• Startup and Commissioning Support	
Startup Oversight	200.UE.PMT.51.01

Each of these is addressed below.

**Subtask 7.1 – Project Management Plan**

The Phase I PMP will be updated to reflect any changes identified in cost or schedule during the Phase I activities. The DOE Project Officer will be apprised of all changes that have occurred from the Phase I PMP. The Alliance will provide, with support from URS, an updated PMP to DOE within 90 days after the Phase II start date as specified in the cooperative agreement.

**Subtask 7.2 – Project Management and Controls**

This task includes project management and project controls to maintain financial and schedule oversight and control of the project. Supported by URS in a project

management role, the Alliance will utilize earned value management techniques meeting industry standards for tracking completion of work, keeping activities on schedule, and controlling costs to remain within the budget. The Alliance will implement and manage the project and reports on activities in accordance with the approved PMP, which will be revised throughout the phases of the project.

### **Subtask 7.3 – Technical Reporting and Coordination**

With support from URS, the Alliance will prepare and submit reports and deliverables as required in the Financial Assistance Reporting Requirements Checklist and this SOPO. URS will also coordinate the preparation of technical reports, such as technology cost reports, cost estimate roll-ups, topical reports, and technical papers.

In Phase I, the Alliance organized the Technical Committee, which was created by the Alliance and Ameren to serve as a resource for ideas and information, to share information about the oxy-combustion and CO<sub>2</sub> pipeline and storage project technologies to be used, to contribute to the generation and quality of work products, and to contribute to the general knowledge of the FutureGen 2.0 participating companies. The committee includes representatives from the Alliance member companies and the project partners; DOE is also invited to participate.

One Technical Committee meeting was held in Phase I. In Phase II, however, the Alliance will significantly increase the role of the committee, holding meetings at least quarterly to facilitate the transfer of knowledge among all the project participants and DOE. The Alliance, supported by URS, will organize the committee meetings at times and places convenient to the members and to DOE and will arrange for presentations and explanatory materials to enable the committee's work. The exchange of technical and economic information to be facilitated by the Technical Committee is a significant part of the value proposition for the FutureGen 2.0 participating organizations.

Apart from regular Technical Committee meetings, technical exchanges will be conducted to address technology challenges, benefits, designs, operating protocols, cost, and performance and reliability characteristics of the fully integrated FutureGen 2.0 projects. Such exchanges will include the following types of information:

- Overall and detailed project layout information,
- Plant and system performance data,
- System and subsystem configuration,
- Plant process information, and
- Cost information.

### **Subtask 7.4 – Commercial and Financial Activities**

**Subtask 7.4.0 – Commercial Contracts Development.** The Alliance, supported by consultants and legal specialists, will create, negotiate, and complete key

contracts required to close financing. Those include, but are not limited, to EPC contracts, O&M contracts, Commissioning /Performance Testing (system-wide) contracts, Oxygen/Gases Supply, Coal Supply, Ash Disposal, CO<sub>2</sub> sale to Transport/Storage Entity, Sale of Site Assets, etc. These activities are scheduled to begin promptly at the start of Phase II and continue throughout Phase II to meet timely completion dates needed to support the financing process.

**Subtask 7.4.1.** – Financial Model. The Alliance, supported by PKM Energy, will update and amend as required the existing project financial model as final capital and operating cost estimates are completed and the business and financing structures are finalized. The updated financial model will include income (revenues and expenses), cash flow and balance sheet statements that reflect the Alliance’s business and financing structure, and DOE’s cost share agreement for the oxy-combustion project. Sensitivity and variance analysis will be performed as needed.

**Subtask 7.4.2.** – Project Financing. Working with its financial advisors, XMS Capital Partners and PKM Energy, the Alliance will arrange for the third-party non-recourse project financing. The financing is required to supplement the American Recovery and Reinvestment Act (ARRA) funding from DOE. Raising debt financing will include identification of the most efficient sources of capital for the project (most likely banks), educating and negotiating with the financial institutions regarding the structure and terms of the debt capital, and managing a competitive process to raise the most attractively priced financing for the project.

The financing activities will also include securing the necessary equity capital for the oxy-combustion project. While it is currently envisioned that the Alliance members will contribute some or all of the required equity capital, this effort will be closely coordinated with the non-recourse project financing. Other sources of equity capital may also be considered.

## **Subtask 7.5 – Power Purchase Agreement**

**Subtask 7.5.1.** – Developing PPAs. The Alliance, supported by its legal counsel (Van Ness Feldman and McGuireWoods), financial advisors (XMS Capital Partners), and commercial and financial consultant (PKM Energy) the Alliance will complete the negotiation of and gain necessary regulatory approval(s) for PPAs with Commonwealth Edison, Ameren Illinois, and the alternative retail energy suppliers. Since the PPAs will provide the required revenue stream to support the proposed third-party non-recourse project financing, the Alliance will ensure that the PPAs are financeable contracts.

**Subtask 7.5.2.** – PPA Approvals. The Alliance will work with the IPA and the Illinois Commerce Commission (ICC) as they analyze the cost of electricity from the oxy-combustion power plant and the impact of such costs on the Illinois ratepayers. The work with the IPA is critical since they are proposing to include

clean coal, in the form of FutureGen 2.0, as a generation resource option in their 2013 procurement plan that will be filed with the ICC in September 2012. The IPA and the ICC must analyze the proposed cost of electricity and ratepayer impact from the project in accordance with the Clean Coal Provisions of the Illinois Power Agency Act. This cost and ratepayer analysis will be a critical input into the decision by the ICC of whether to approve the proposed PPA(s).

The Alliance will ensure that the costs for the transportation, injection, and storage of the CO<sub>2</sub> are properly reflected in the cost-of-service formula rate being developed for the PPAs required to support the proposed third-party non-recourse financing of the oxy-combustion power plant project portion of the FutureGen 2.0 Project. Because the CO<sub>2</sub> Services Agreement will likely be considered a material contract necessary for the financing, the Alliance will work with its financial and legal advisors to ensure that the CO<sub>2</sub> Service Agreement meets all lender requirements.

**Subtask 7.5.3.** – FERC Approval. The Alliance, supported by Van Ness Feldman, will work to obtain market-based rate approval of the PPA(s) from the Federal Energy Regulatory Commission.

#### **Subtask 7.6 – MISO Interconnection Application**

The Alliance, supported by Patrick Engineering, will continue the process of obtaining a MISO Generator Interconnection Agreement to place the power generated by the oxy-combustion power plant on the existing transmission grid. Working with electrical engineers from Patrick Engineering, the Alliance will submit an application for generator interconnection to MISO and work with MISO throughout its conduct of a required feasibility study and a system impact study. The Alliance and/or its subcontractors will also attend meetings with MISO as requested to address questions and study results.

This task will require the payment of an application fee to MISO and payment for the feasibility and system impact studies.

#### **Subtask 7.7 – Teaming and Contracting Activities**

The teaming and contracting activities for Phase II are designed to support the timely preparation and acquisition of documents required to close financing on schedule. This will require an overlapping schedule beginning with development of definitive terms and conditions early in Phase II which will be fed by final design, performance data, and cost estimates at the 30-40 percent engineering complete level, and then negotiation of all key contracts completed in time to escrow those contracts in the data room in order for investors to perform their due diligence. Because of the unique status of oxy-combustion technology, Phase II will complete up to 90 percent of the definitive and final engineering and design definition and pre-construction procurement contracts, providing a high level of confidence in the performance and reliability of the project and to accelerate the construction schedule in Phase III.

**Subtask 7.7.1. – Teaming Agreements.** During Phase II, the Alliance will update and sign teaming agreements with URS as the Owner’s Engineer, B&W, and AL to establish clear alignment on the Phase III execution philosophy. The teaming agreement will establish common goals and ensure open book, transparent sharing of data to achieve those common goals. Support from legal counsel will be required.

**Subtask 7.7.2. – EPC Contracts.** The Alliance will develop, negotiate and execute contracts the following EPC contracts during Phase III:

5. [REDACTED] EPC Contract for the entire Oxy-combustion Power Plant Project excluding only the ASU and CPU. This contract will include the sub-recipient scope and the balance of plant scope. [REDACTED]
6. AL EPC Contract for the ASU including the option for ALLLI to acquire the ASU and operate the ASU and supply oxygen and other services “over the fence”.
7. AL EPC Contract for the CPU. AL Process and Construction will be the EPC contractor for this proprietary technology and sub-recipient scope.
8. Commissioning and Performance Testing Contract. The EPC contracts will include firm pricing and date certain obligations ending with achieving “Ready to Test” conditions. Since investors will require a system-wide test of the integrated BW and AL designed facilities, a contract between the Alliance and the EPC contractors will be required to pay for and manage the commissioning and performance testing of the complete system. This contract will likely include incentives to achieve guaranteed performance standards and penalties if such standards are not achieved.

In order to meet the financing schedule, the terms and conditions of these contracts will be negotiated beginning at the start of Phase II and be in place by the time 30-40 percent of the engineering is completed and firm prices and other commercial metrics are read to populate the contract and exhibits. Substantial support from legal counsel will be required. The Alliance has retained top counsel from Latham and Watkins to help expedite this process.

**Subtask 7.7.3. – Materials and O&M Contracts**

**Material Contracts.** The Alliance will develop and execute contracts for fuel, CO<sub>2</sub> sales, ash disposal, and oxygen supply (if needed). These contracts are scheduled to be completed midway through Phase II so they can be escrowed with the potential investors and due diligence can begin.

**Operations and Maintenance Contracts.** The Alliance will negotiate an O&M contract with a B&W subsidiary to operate the plant except for the

ASU and CPU, which will be operated by AL. Substantial support legal counsel will be required. Latham and Watkins and Van Ness Feldman will provide that support.

**Subtask 7.7.4.** – Cost- and Performance-Related Reviews. Using the services of Hensley Energy Consulting, the Alliance will perform engineering design reviews for the B&W oxy-combustion island and the AL CPU. Hensley Energy Consulting will also support the Alliance in the negotiation of the above contracts as needed.

### **Subtask 7.8 – Power Plant Architectural Design**

During Phase II, the Alliance will obtain architectural design services for the power plant. This will involve the development of a Request for Proposals, evaluation of proposals, selection of an architectural design firm, and negotiation of a contract with mutually acceptable terms and conditions. Support from legal counsel will be required.

### **Subtask 7.9 – NEPA and Permitting Support**

**Subtask 7.9.1.** – NEPA Support. The Alliance will continue to support DOE’s NEPA process, using the services of Lucinda Low Swartz as the Alliance’s lead for NEPA support. The Alliance will obtain and provide requested information in a timely manner, provide comments on preliminary sections of the environmental impact statement (EIS), participate in public hearings on the draft EIS, prepare responses to comments received on the draft EIS, provide a revised environmental and design data for the oxy-combustion power plant project, support the preparation of a final EIS, and review a draft DOE record of decision. The Alliance will coordinate the input from the other project partners to DOE’s NEPA process.

**Subtask 7.9.2.** – Environmental Permitting. In Phase I, Ameren (in cooperation with the Alliance) submitted air and water permits to IEPA. In Phase II, the Alliance will work with Ameren to revise the permit applications to reflect design changes in the project and address any questions or requests for additional information regarding the permit applications. The Alliance will also participate in any public hearings with respect to the requested permits. The project environmental and construction permit process will continue following the successful completion of the NEPA EIS.

### **Subtask 7.10 – Local Government and Stakeholder Activities**

The Alliance, supported by its Illinois counsel McGuireWoods, will engage local elected officials in Morgan County regarding the project and work on the development of a real estate tax agreement. The Alliance will also undertake community outreach activities relating to the Oxy-combustion Power Plant Project.

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## **Task 8.0 – FEED and Final Design**

DOE’s NEPA review and the Alliance’s permitting efforts are intended to proceed in parallel with the FEED process. After DOE issues its NEPA record of decision, the Alliance will have completed sufficient engineering and procurement efforts to immediately begin placing orders for long lead time materials and equipment during Phase II.

The design effort in Phase II will be conducted in two steps (FEED and final design). FEED will bring the design to 30 – 40 percent, at which point the FEED results will be sent to the cost estimating team. Assuming that DOE has issued a NEPA record of decision, in parallel to the cost estimate development and prior to the completion of Phase II, the design team will proceed with final design bringing the level of design detail up to 70 to 90 percent of the engineering and procurement bids. This is far more than is typically done prior to full release of EPC contracts. FutureGen 2.0 is different in that the core technology is first-of-a-kind at this scale. As described above, design work will be carried out continuously but at the 30 to 40 percent level (in month 8 or 9), the EPC contractors will provide the Alliance with a definitive cost estimate suitable for populating the fully negotiated EPC contracts and completion of executable contracts. This is needed so the financing effort can continue while the remainder of design is being conducted.

Phase II design will be focused on: (1) development of detailed plant and equipment designs; (2) development of specifications for procurement of material, equipment, and construction services; and (3) preliminary procurement efforts including partial or conditional awards to select vendors limited to obtaining certified vendor engineering to allow the detailed engineering deliverables to advance to approved for construction status (the release of material or fabrication will not occur until Phase III). With this deeper level of effort, the EPC contractors will be able to commit to the EPC Contracts in time to begin financial due diligence and hold the validity dates on those contracts until financing can be closed.

### **Subtask 8.1 – Design Study**

The project team will finalize the plant design basis including the arrangement of the plant equipment, integration of the boiler with the existing steam turbine island and balance of plant equipment and will commence with preparation of specifications for equipment purchases. Based on the design and plant specifications, B&W will finalize the performance, arrangement, and sizing of all equipment in the power block. AL will finalize the design, performance, arrangement and sizing of the ASU and CPU. Integration between the power block, ASU, and CPU will be established. This information will provide the technical details to support the permit applications and the NEPA EIS and produce accurate estimates of materials, labor, and purchased equipment to construct the plant.

URS, as the Alliance’s Owner’s Engineer, will have a substantial role in supporting the Alliance project manager in the execution of the design, including detailed technical reviews, quality assurance, and assuring technical integration between the project partners.

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**Subtask 8.1.1 – Steam Generator Island including Gas Quality Control Equipment (BW PGG)**

**Subtask 8.1.1.1 – Boiler and GQCS Project Management Services and Support.** This subtask will include the ‘Level of Effort’ components of the B&W Project Team including the following cost codes:

Project Manager – Boiler	200.BW.B10.61.ZP.1100
Project Scheduling – Boiler	200.BW.B10.61.ZP.1200
Project Cost Estimating	200.BW.B10.61.ZP.1300
Project Engineers – Boiler	200.BW.B10.61.ZP.1400
Project Accounting	200.BW.B10.61.ZP.1500
Project Procurement Manager - Boiler	200.BW.B10.61.ZP.1900
PM Travel - Boiler	200.BW.B10.61.ZP.7000
Project Manager – GQCS	200.BW.B20.61.ZP.1100
Project Scheduling – GQCS	200.BW.B20.61.ZP.1200
Project Engineers – GQCS	200.BW.B20.61.ZP.1400
Project Procurement Manager - GQCS	200.BW.B20.61.ZP.1900
PM Travel – GQCS	200.BW.B20.61.ZP.7000
BWCC Home Office Supt - Boiler	200.BW.B10.61.ZC.4000
BWCC Home Office Supt - GQCS	200.BW.B20.61.ZC.4000
BWCC Site Support - Boiler	200.BW.B10.61.ZC.1000
BWCC Site Support - GQCS	200.BW.B20.61.ZC.1000

The “Level of Effort” members of the Boiler/GQCS Project Team will not directly produce hard deliverables, but will play a vital role in project development and execution. Project Managers will compile and transmit the periodic reports that are required, participate in and/or lead internal and external meetings, and serve as the primary interface between the other principal participants of the FutureGen project. Project Schedulers maintain and update the Primavera schedule utilized by the project team. Project Engineers are the key inter-discipline technical interface within B&W as well as with other members of the FutureGen team. Project Procurement Managers are responsible for the interface between B&W and the sublet vendors and will transmit Request for Quotation documents, compile vendor bid evaluations, and negotiate vendor terms and conditions. Project Cost Estimating and BWCC Support will be utilized during Phase II to compile the re-estimate of the Phase III portion of the project.

**Subtask 8.1.1.2 – Boiler and GQCS Technical Activities (BW PGG)**

Performance and Functional Design (Air and Oxy-fired) - The comprehensive heat and mass balance for the steam generator island defining all required inputs and byproduct streams under various load conditions when firing with air and when in oxy-firing mode will be updated from the Phase I design. Based on the Heat and Mass balances, sizes and specifications for all major components will be developed. A comprehensive equipment list for the facility including equipment

sizing and performance criteria will be determined. The Steam Generator Island, ASU, and CPU engineering will be coordinated to identify and implement heat and process integration between the facilities that will economically improve plant efficiency. A dynamic system model will be developed during Phase II to determine interaction of the Boiler/GQCS/ASU/CPU during system upsets and transient conditions. Boiler and GQCS general arrangement drawings will be completed. Boiler, GQCS, and auxiliary equipment loads will be calculated for inclusion into the design of the structural steel, foundations, and piping supports. In addition, P&IDs and major electrical information including Input/Output count for the digital control system will be generated. Included under this subtask are the following cost codes:

Sublet Architect Engineer- Boiler	200.BW.B10.61.ZE.1000
Sublet Architect Engineer- GQCS	200.BW.B20.61.ZE.1000
Boiler Functional Design/Perf	200.BW.B10.61.ZE.2000
GQCS Functional Design/Perf	200.BW.B20.61.ZE.2000
Boiler Technology	200.BW.B10.61.ZE.5000
GQCS Technology	200.BW.B20.61.ZE.5000
Boiler Structural Mechanics	200.BW.B10.61.ZE.3000
GQCS Structural Mechanics	200.BW.B20.61.ZE.3000
Boiler Tech Design/Graphics	200.BW.B10.61.ZE.4000
GQCS Tech Design/Graphics	200.BW.B20.61.ZE.4000
Boiler Inst/Elec/Controls	200.BW.B10.61.ZE.6000
GQCS Inst/Elec/Controls	200.BW.B20.61.ZE.6000

Work products developed during Phase II from the above group include:

- Boiler/GQCS P&ID's
- Boiler/GQCS General Arrangement Drawings
- Boiler/GQCS Erection Arrangement Drawings
- Equipment Lists
- Electrical Load Lists
- Electrical One Line Diagram
- Valve Lists
- Instrument Lists
- PFD's
- Structural steel MTO's
- Subcontract bid packages
- Dynamic modeling results

**Subtask 8.1.1.3 – Boiler and GQCS Material and Equipment Procurement (BW PGG)**

Currently, Phase II procurement activities will be limited to vendor engineering required to support the overall project schedule. The following cost code items are included:

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Structural Steel	200.BW.B10.05.MS
Dampers/Expansion Joints	200.BW.B10.06.A0
Boiler Air System	200.BW.B10.06.AA
Boiler Sootblower System	200.BW.B10.06.AI
Boiler Fuel Prep System	200.BW.B10.06.AP
Boiler Flue Gas System	200.BW.B10.06.BM
Boiler Steam System	200.BW.B10.11.AS
Boiler Water System	200.BW.B10.11.AW
Service Air System	200.BW.B10.11.LF
Bottom Ash System	200.BW.B10.11.WL
Gas Heaters	200.BW.B10.06.BQ
Electrical Power Systems	200.BW.B10.12.E0
Vibration Monitoring System	200.BW.B10.13.IV
Control System	200.BW.B10.13.J0
Aux Steam System	200.BW.B10.11.LF
Comb. Gas Clean-up System	200.BW.B20.06.G0
Particulate Removal System	200.BW.B20.06.GB
Dehumidification System	200.BW.B20.06.GX
Flyash Disposal System	200.BW.B20.06.WM
Comb. Gas Clean-up System	200.BW.B20.11.G0
Comb. Gas Clean-up System	200.BW.B20.13.G0
Particulate Removal System	200.BW.B20.11.GB
Particulate Removal System	200.BW.B20.13.GB

Deliverables from the purchased vendor engineering during the Phase II effort will include certified equipment weights and dimensions for each of the components that can, in turn, be incorporated into the overall Boiler/GQCS detailed design.

#### **Subtask 8.1.2 –Air Separation Unit Definition (ALPC)**

Several strategies will be evaluated in Phase II to determine the most economic design and arrangement for supply of oxygen to the plant. Regardless of the final arrangement for supply of oxygen to the plant, it is recognized that the operation of the ASU is integral to the overall performance of the oxy-combustion process. The design of the ASU will be fully integrated into the design of the project to have the greatest positive impact on overall plant cost and efficiency.

##### **Subtask 8.1.2.1 –ASU Project Management Services and Support.**

This subtask will include the “Level of Effort” components of the AL Project Team including the following cost codes:

Project Management Support	200.AL.ASU.61.50
Other Management Support	200.AL.ASU.61.60
Project Engineering	200.AL.ASU.61.05

Project Management	200.AL.ASU.61.51
Administrative	200.AL.ASU.61.52
Document / Data Control	200.AL.ASU.61.01
Estimating	200.AL.ASU.61.53
Project Cost Control	200.AL.ASU.61.56
Project Scheduling	200.AL.ASU.61.54
Construction Support/HSES	200.AL.ASU.61.63
Startup & Commissioning Support	200.AL.ASU.61.33

The “Level of Effort” members of the ALPC Project Team will not directly produce hard deliverables, but will play a vital role in project development and execution. Project Managers will compile and transmit the periodic reports that are required, participate in and/or lead internal and external meetings, and serve as the primary interface between the other principal participants of the FutureGen project. Project Schedulers will maintain and update the Primavera schedule utilized by the project team. Project Engineers are the key inter-discipline technical interface within ALPC as well as with other members of the FutureGen team. Project Procurement Managers are responsible for the interface between ALPC and the sublet vendors and will transmit Request for Quotation documents, compile vendor bid evaluations, and negotiate vendor terms and conditions. Project Cost Estimating and BWCC Support will be utilized during Phase II to compile the re-estimate of the Phase III portion of the project.

**Subtask 8.1.2.2 – ASU Technical Activities (ALPC)**

Performance and Functional Design (Air and Oxy-fired) - The comprehensive heat and mass balance for the ASU island defining all required inputs and byproduct streams under various load conditions when firing with air and when in oxy-firing mode will be updated from the Phase I design. Based on the Heat and Mass balances, sizes and specifications for all major components will be developed. A comprehensive equipment list for the facility including equipment sizing and performance criteria will be determined. The Steam Generator Island, ASU, and CPU engineering will be coordinated to identify and implement heat and process integration between the facilities that will economically improve plant efficiency. A dynamic system model will be developed during Phase II to determine interaction of Boiler/GQCS/ASU/CPU during system upsets and transient conditions. ASU general arrangement drawings will be completed. ASU equipment loads will be calculated for inclusion into the design of the structural steel, foundations, and piping supports. In addition, P&IDs and major electrical information including Input/Output count for the digital control system will be generated. Included under this subtask are the following cost codes:

Process Engineering	200.AL.ASU.61.21
Systems Design	200.AL.ASU.61.22
Civil / Structural Design	200.AL.ASU.61.12
Mechanical Design	200.AL.ASU.61.15
Controls Systems	200.AL.ASU.61.20

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Piping Design / Stress	200.AL.ASU.61.16
Electrical Engineering	200.AL.ASU.61.17
E&I Design	200.AL.ASU.61.19

Work products developed during Phase II from the above group include:

- P&ID's
- General Arrangement Drawings
- Erection Arrangement Drawings
- Equipment Lists
- Electrical Load Lists
- Electrical One Line Diagram
- Valve Lists
- Instrument Lists
- PFD's
- Structural steel MTO's
- Subcontract bid packages
- Dynamic modeling results

**Subtask 8.1.2.3 – ASU Material and Equipment Procurement**

Currently, Phase II procurement activities will be limited to vendor engineering required to support the overall project schedule. The following cost code items are included:

Cold Box System	200.AL.ASU.06.CB
Storage System	200.AL.ASU.06.ST
Compression	200.AL.ASU.06.CP
Precooling System Tower	200.AL.ASU.06.PC
Purification System	200.AL.ASU.06.PU

Deliverables from the purchased vendor engineering during the Phase II effort will include certified equipment weights and dimensions for each of the components that can, in turn, be incorporated into the overall ASU detailed design

**Subtask 8.1.2.4 - ALPC** and its affiliate ALLIUS will assist in the evaluation of an OTF arrangement. The Alliance has asked AL to assist in understanding how an OTF arrangement can benefit the project. This includes working with the Alliance, understanding the PPA agreement, modeling different OTF case scenarios, assisting the Alliance with modeling the levelized cost of energy with an OTF arrangement, assisting the Alliance with IPA discussions or any other political entity. ALPC will model various OTF scenarios and provide input on operational inputs to help the Alliance develop the lowest cost solution.

**Subtask 8.1.3 – CO<sub>2</sub> Compression and Purification Unit Definition (ALPC)**

Several strategies will be evaluated in Phase II to determine the most economic arrangement of the CO<sub>2</sub> CPU for the plant. The operation of the CPU will be integral to the overall performance of the oxy-combustion process and the design of the CPU will be fully integrated into the design of the project to have the greatest positive impact on overall plant cost and efficiency.

**Subtask 8.1.3.1 CPU Project Management Services and Support.**

This subtask will include the “Level of Effort” components of the AL Project Team including the following cost codes:

Project Management Support	200.AL.CPU.61.50
Other Management Support	200.AL.CPU.61.60
Project Engineering	200.AL.CPU.61.05
Project Management	200.AL.CPU.61.51
Administrative	200.AL.CPU.61.52
Document / Data Control	200.AL.CPU.61.01
Estimating	200.AL.CPU.61.53
Project Cost Control	200.AL.CPU.61.56
Project Scheduling	200.AL.CPU.61.54
Construction Support/HSES	200.AL.CPU.61.63
Startup & Commissioning Support	200.AL.CPU.61.33

The “Level of Effort” members of the ALPC Project Team will not directly produce hard deliverables, but will play a vital role in project development and execution. Project Managers will compile and transmit the periodic reports that are required, participate in and/or lead internal and external meetings, and serve as the primary interface between the other principal participants of the FutureGen project. Project Schedulers will maintain and update the Primavera schedule utilized by the project team. Project Engineers are the key inter-discipline technical interface within ALPC as well as with other members of the FutureGen team. Project Procurement Managers will be responsible for the interface between ALPC and the sublet vendors and will transmit Request for Quotation documents, compile vendor bid evaluations, and negotiate vendor terms and conditions. Project Cost Estimating and BWCC Support will be utilized during Phase II to compile the re-estimate of the Phase III portion of the project.

**Subtask 8.1.3.2 – CPU Technical Activities (ALPC)**

Performance and Functional Design (Air and Oxy-fired) - The comprehensive heat and mass balance for the CPU island defining all required inputs and byproduct streams under various load conditions when firing with air and when in oxy-firing mode will be updated from the Phase I design. Based on the Heat and Mass balances, sizes and specifications for all major components will be developed. A comprehensive equipment list for the facility including equipment sizing and performance criteria will be determined. The Steam Generator Island,

ASU, and CPU engineering will be coordinated to identify and implement heat and process integration between the facilities that will economically improve plant efficiency. A dynamic system model will be developed during Phase II to determine interaction of Boiler/GQCS/ASU/CPU during system upsets and transient conditions. CPU general arrangement drawings will be completed. CPU equipment loads will be calculated for inclusion into the design of the structural steel, foundations, and piping supports. In addition, P&IDs and major electrical information including Input/Output count for the digital control system will be generated. Included under this subtask are the following cost codes:

Process Engineering	200.AL.CPU.61.21
Systems Design	200.AL.CPU.61.22
Civil / Structural Design	200.AL.CPU.61.12
Mechanical Design	200.AL.CPU.61.15
Controls Systems	200.AL.CPU.61.20
Piping Design / Stress	200.AL.CPU.61.16
Electrical Engineering	200.AL.CPU.61.17
E&I Design	200.AL.CPU.61.19

Work products developed during Phase II from the above group include:

- P&ID's
- General Arrangement Drawings
- Erection Arrangement Drawings
- Equipment Lists
- Electrical Load Lists
- Electrical One Line Diagram
- Valve Lists
- Instrument Lists
- PFD's
- Structural steel MTO's
- Subcontract bid packages
- Dynamic Modeling Results

### **Subtask 8.1.3.3 – CPU Material and Equipment Procurement (ALPC)**

Phase II procurement activities will be limited to vendor engineering required to support the overall project schedule. The following cost code items are included:

Cold Box System	200.AL.CPU.06.CB
Storage	200.AL.CPU.06.ST
Compression	200.AL.CPU.06.CP
Precooling	200.AL.CPU.06.PC
Purification Unit	200.AL.CPU.06.PU
Mercury System	200.AL.CPU.06.HG
Catox System	200.AL.CPU.06.CT

Membrane  
Feed Pretreatment

200.AL.CPU.06.MB  
200.AL.CPU.06.FP

Deliverables from the purchased vendor engineering during the Phase II effort will include certified equipment weights and dimensions for each of the components that can, in turn, be incorporated into the overall ASU detailed design

**Subtask 8.1.3.4** - ALPC and its affiliate ALLIUS will work with the Alliance to provide guidance and understanding how an OTF arrangement can benefit the project. This includes working with the Alliance on the PPA agreement, modeling different case scenarios, assisting the Alliance with modeling the levelized cost of energy with other various arrangements, and assisting the Alliance with IPA discussions or any other political entity. ALPC will model various scenarios and providing operational inputs to help the Alliance develop the lowest cost solution.

#### **Subtask 8.1.4 Balance of Plant Equipment, Plant Integration**

**Subtask 8.1.4.1** – Balance of plant equipment will be evaluated and specifications generated for all new equipment. Purchase orders and subcontracts will be placed to facilitate the receipt of certified vendor engineering to support the detail design deliverables required for the repowering. Design data and information required to integrate the existing facility with the new oxy-combustion plant will be developed. Engineering work to generate equipment arrangement drawings will be done to produce an updated total plant arrangement. The following cost code items are included:

FG 2.0 Ph2 - Civil	002.UE.BOP.61.12
FG 2.0 Ph2 - Structural	002.UE.BOP.61.13
FG 2.0 Ph2 - Mechanical (Incl FP)	002.UE.BOP.61.15
FG 2.0 Ph2 - Piping (Incl GA)	
002.UE.BOP.61.16	
FG 2.0 Ph2 - Electrical	002.UE.BOP.61.17
FG 2.0 Ph2 - Instrumentation	002.UE.BOP.61.19
FG 2.0 Ph2 - Process	002.UE.BOP.61.21
FG 2.0 Ph2 - Material Handling	002.UE.BOP.61.47
FG 2.0 Ph2 - Document Control	002.UE.BOP.61.01
FG 2.0 Ph2 - CADD	002.UE.BOP.61.04
FG 2.0 Ph2 - Project Engineering	002.UE.BOP.61.05
FG 2.0 Ph2 - Project Management	200.UE.BOP.61.51
FG 2.0 Ph2 – Estimating	200.UE.BOP.61.53
FG 2.0 Ph2 - Planning & Scheduling	200.UE.BOP.61.54
FG 2.0 Ph2 – Secretarial	200.UE.BOP.61.55
FG 2.0 Ph2 - Cost Analyst	200.UE.BOP.61.56
FG 2.0 Ph2 - Business Management	200.UE.BOP.61.57
FG 2.0 Ph2 - Project Control Supervision	200.UE.BOP.61.58

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FG 2.0 Ph2 - Construction Management	200.UE.BOP.61.63
FG 2.0 Ph2 - Procurement Management	200.UE.BOP.61.71
FG 2.0 Ph2 – Purchasing	200.UE.BOP.61.72
FG 2.0 Ph2 - Subcontract Administration	200.UE.BOP.61.75
FG 2.0 Ph2 - QA/QC	200.UE.BOP.61.87
FG 2.0 Ph2 - Travel/Expenses	200.UE.BOP.61.94

### **Subtask 8.2 – Operations and Maintenance Estimates**

██████████ ALLLI will develop detailed estimates of the fixed and variable costs for operating the ASU and CPU and the power plant (excluding the ASU and CPU). These estimates will be detailed and serve as the basis for negotiating the O&M contracts and to feed reliable data to the financial projections and investor due diligence. These O&M Facility Cost Reports will be delivered concurrently with the Facility Cost Report described below.

### **Subtask 8.3 – Facility Cost Report**

A preliminary facility cost report, defining the project will be created for use in permit applications. A Facility Cost Report will also be generated at the 30 to 40 percent engineering complete milestone to provide the data to populate the negotiated EPC contracts and allow financing to proceed on schedule. This report will be an open book, detailed estimate of the facility costs for each EPC contractor including detailed backups and schedules and risk analysis. The cost report will also support a cost of service analysis and for use in developing the PPA(s).

## **Task 9.0 – Equipment Design and Process and Controls Engineering** ██████████

Phase II engineering work will primarily consist of completion of engineering to support equipment procurements and fabrication and final design of the overall plant process and control systems. Activities will be focused on component design specifications for procurement and selection of equipment, suppliers, and subcontractors.

### **Subtask 9.1 – Project Engineering**

#### **Subtask 9.1.1 – Final Design and Procurement Specifications for Balance of Plant equipment** ██████████

Final procurement specifications for all balance of plant components will be completed by the Architect-Engineer. The following cost code items are included:

Condensate Storage Tank - Field Erected	002.UE.BOP.06.01.6100
Water Treatment/Handling Equipment	002.UE.BOP.06.01.7000
Circulating Water System (Supply & Water Pumps)	002.UE.BOP.06.01.5000
Waste Water Treatment System	002.UE.BOP.06.01.7000

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Oily/Water Separator	002.UE.BOP.06.01.4600
Compressed Air System	002.UE.BOP.06.01.1400
Well Pump	002.UE.BOP.06.01.5000
Coal Handling Conveyors	002.UE.BOP.06.01.1600
Cooling Towers	002.UE.BOP.06.01.1700
Stack (Shell and Liner)	002.UE.BOP.06.01.6000
Auxiliary Transformer	
002.UE.BOP.12.01.0200	
13.8kV Outdoor Switchgear	002.UE.BOP.12.01.0400
Transmission Line Relocation	002.AM.PMT.61.12.0000

**Subtask 9.1.2 – Final Design and Procurement Specifications for Oxy-fuel Boiler (BWPGG)**

All details and specifications required for fabrication of the boiler and ancillary equipment such as air heater, pulverizers, fans, steam coil flue gas coolers and heaters, flues, dampers, instrumentation, etc. will be completed by B&W.

**Subtask 9.1.3 – Final Design and Procurement Specifications for Gas Quality Control Equipment (BWPGG)**

All details and specifications required for procurement and fabrication of baghouses, flue-gas desulfurization scrubbers, gas cooler for moisture control and removal of other flue gas constituents will be completed by B&W.

**Subtask 9.1.4 – Final Design and Procurement Specifications for Air Separation Unit (ALPC)**

The final details for fabrication of all ASU components and specifications for purchased components will be completed by AL.

**Subtask 9.1.5 – Final Design and Procurement Specifications for CO<sub>2</sub> Compression and Purification Unit (ALPC)**

The final details for fabrication of all CPU components and specifications for purchased components will be completed by AL.

**Subtask 9.2 – Plant Optimization Review** XXXXXXXXXX

Throughout the Phase II process, the project design will be reviewed to identify opportunities for cost optimization. When integration is not practical for either technical or economic reasons, optimization concepts will be recorded for future considerations.

**Task 10.0 – Procurement, Preliminary Equipment and Subcontract Sourcing Plan (Each EPC Contractor within its scope of work).**

In support of Task 10.0, procurement activities limited to proposal sourcing efforts and procurement of equipment engineering will commence to support development of accurate costs and scheduling, as well as to facilitate detailed process/system engineering. Bids will be received and evaluated in order to make vendor selections to support the project budget and schedule. Most of the major procurement decisions will be made and key vendors selected as

needed, but no material will be purchased until the NEPA record of decision is released and full notice to proceed is given. Should lead-times and availability of major materials become an issue, some material procurement commitments may be required in order to support the project schedule. These items will be discussed with DOE prior to making any major material or equipment purchases.

### **Task 11.0 – NEPA, Project Permits, Community Surveys (Alliance)**

The NEPA review and project permitting will proceed in parallel with Tasks 8.0 and 9.0.

#### **Subtask 11.1 – Project Permits**

The Alliance will continue efforts to secure all the necessary permit approvals for construction and operation of the project. The following cost code is included:

FutureGen 2.0 Phase II - Environmental Services                      002.UE.BOP.61.31

The permits approvals needed may include:

- Air Permits
- Water and Waste Water Permits
- U.S. Environmental Protection Agency (EPA) Title IV Acid Rain Permit
- Solid Waste Disposal Industrial Landfill Permit (if required)
- NPDES Industrial Storm Water Permit and Storm Water Management Plan
- NPDES Industrial Waste Water Discharge Permit (if required)
- Permit to Construct Public Water Supply
- Spill Prevention, Control and Countermeasures Plan for Operation
- Miscellaneous Utility and Access Right-of-Way Permits
- Other required approvals

#### **Subtask 11.2 – NEPA Review**

The Alliance, with the other project partners and supported by URS, will coordinate with DOE to provide the information required to support the NEPA review of FutureGen 2.0. In Phase I, URS and Ameren prepared numerous data packages to describe the preliminary plant design and the environmental resources potentially affected by the Oxy-Combustion Power Plant Project for use in the EIS; together, these data packages make up the EIV for the project. In Phase II, URS will be responsible for updating the data packages to reflect design changes and additional environmental information. It is imperative that the NEPA process be completed in a timely fashion to achieve the coordinated Project Schedule.

#### **Subtask 11.3 – Affected Community Survey**

Although planned by Ameren for Phase I, this survey was not conducted. The Alliance will continue to work with the local community, including through its Citizen Advisory Board, to understand and resolve community issues.

### **Task 12.0 – Decision Point Application (for Phase III)**

In accordance with the cooperative agreement, DOE’s decision to authorize funding for Phase III will be based in part on progress toward meeting the objectives of the project and will include an evaluation of the progress toward meeting the key milestones and deliverables. In particular, the following must be completed before DOE authorizes funding for Phase III:

- Phase III DPA
- Firm commitments for cost share requirements for Phase III consisting of
  - Financial Plan/Financial Commitment Letter(s)
  - Complete Pro Forma Model
- Executed EPC and O&M Contracts and Commission/Performance Testing Contracts
- Executed CO<sub>2</sub> Off-Take Agreement
- Executed PPA(s)
- Executed site construction labor agreement(s)
- FEED Study
- Equipment design and process and controls engineering approximately 70 to 90 percent complete
- Detailed project schedule for Phase III (including coordination with the CO<sub>2</sub> Pipeline and Storage Project)
- Sufficient progress on environmental permits needed for construction
- Necessary commitments for project host site in place
- NEPA review and issuance of a record of decision authorizing DOE funding of Phases III and IV
- Agreement on a liquidated damages clause for inclusion in the cooperative agreement

**Subtask 12.1** – Consistent with the Topical Report format and instructions, the Alliance will prepare and submit a detailed technical Topical Report discussing the technical results of the work performed under the Phase II SOPO tasks. This report will be submitted to DOE no later than 60 days prior to the end of Phase II. In addition, the Alliance will submit a DPA directly to the DOE Program Manager/Project Officer and the DOE Contract Specialist no later than 60 days prior to the end of Phase II. The DPA will include the information described in Subtasks 12.2 and 12.3.

**Subtask 12.2** – A report on progress toward meeting the objectives of the project, including any significant findings, conclusions, or developments. Specific discussion and quantitative analysis (when applicable) will be made regarding progress toward completion of key milestones identified for each project phase within this SOPO. The report will include a discussion of the status of the project and the ability of the Alliance to meet project objectives.

**Subtask 12.3** – A description of the Alliance’s plans for the conduct of the project during Phase III. These plans will include:

**Subtask 12.3.1** – An updated SOPO that defines all work to be performed under Phase III, showing detail at WBS Level 5, including detail for tasks and subtasks in all remaining phases of the project.

**Subtask 12.3.2** – A detailed budget and supporting justification for Phase III. The budget will identify if additional funds are requested or a reduction of funds is anticipated. The Alliance will identify cash and in-kind contributions and include the basis for valuation of in-kind contributions.

**Subtask 12.3.3** – An updated PMP, including the WBS; project schedule and milestone list; a Baseline Cost Plan on a monthly basis; a description of the project management system for monitoring and controlling scope, schedule, and cost including the plan for reporting earned value; a Project Communication Protocol; and a Risk Management Plan.

**Subtask 12.3.4** – An updated Project Funding Plan for the remainder of the Project, showing sources and uses of funds.

**Subtask 12.3.5** – For each source of funding, audited financial statements for the last three years and any available financial statements for the current year.

**Subtask 12.3.6** – An updated financial model of the project, including a statement of revenues and expenses (income statement), balance sheet, and cash flow statement.

**Subtask 12.3.7** – A financial commitment letter from each funding source.

**Subtask 12.3.8** – Actual copies of the PPA(s), the CO<sub>2</sub> Off-take Agreement, and contracts with project partners and vendors. The Alliance will update its plan for compliance with Davis Bacon Act requirements.

### **3.0 Phase III – Construction and Commissioning (3/1/2014 – 6/30/2017)**

Upon receipt of the Contracting Officer’s written approval authorizing DOE funding of Phase III, the Alliance will commence Phase III activities. These activities will consist of obtaining any remaining permits needed for the project, completion of detailed engineering, procurement of materials and equipment, fabrication and delivery of materials and equipment to the site, construction of the project, commissioning of equipment, plant start-up, and initial plant operations.

The PMP will be updated to reflect any changes identified in cost or schedule during the Phase II activities. The DOE Project Officer will be apprised of all changes that have occurred from the

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Phase II PMP. The Alliance will provide DOE with an updated PMP within 60 days after the Phase III start date as specified in the cooperative agreement.

During Phase III, the Alliance will complete the following key milestones:

- Any remaining required permits secured
- ASU construction
- Oxy-boiler island construction
- GQCS construction
- CPU construction
- Balance of plant construction
- Physical connection to the CO<sub>2</sub> pipeline
- Commissioning and Performance Testing
- Plant start-up
- Commence initial operations, including:
  - Stable air-firing operations proven
  - Stable oxy-combustion operations proven
  - Maximum CO<sub>2</sub> flow on oxy-combustion proven
  - CO<sub>2</sub> available at the agreed-upon terms
- Submission of Phase IV DPA

### **Task 13.0 – Phase III Project Management and Planning**

The PMP will be updated to reflect any changes identified during the Phase II activities. The DOE Project Officer will be apprised of all changes that have occurred from the Phase II PMP. The Alliance will provide DOE with an updated PMP within 60 days after the Phase III start date as specified in the cooperative agreement.

#### **Subtask 13.1 – Project Budget Management**

Based on the information gathered in Phases I and II, the Alliance and the project partners will establish and monitor the project budget. The Alliance will advise the DOE Project Officer of any major discrepancies relative to the project budget.

#### **Subtask 13.2 – Project Economic Evaluation**

Evaluation of the project economics will be monitored throughout Phase III. Quarterly reviews of project capital and operating cost estimates, schedule, funding commitments, and the risk and opportunity assessment will be completed and updated in the project financial model and analyzed for their impact on the total project financial performance. Negative developments will be addressed in a pro-active manner.

#### **Subtask 13.3 – Final Project Budget Plan Refinement**

The project estimates for capital and operating expenses will be maintained and updated as the design is completed and purchases and subcontracts are finalized. Regular budget updates will be provided throughout Phase III to identify, address and track significant variances from the final Project Budget Plan.

#### **Subtask 13.4 – Schedule Refinement**

As purchase commitments are made, the project schedule will be updated and critical path activities identified. Regular schedule updates will be provided throughout Phase III.

#### **Subtask 13.5 – Project Risk and Opportunity Assessment**

The project Risk and Opportunity Management Plan will be maintained and executed to mitigate and manage project risks and capitalize on opportunities to achieve the maximum positive impact on the project design and financials. The project costs will continually be compared to the project budget to identify, address, and track any deviations experienced during this phase.

#### **Subtask 13.3 – DOE Reporting**

##### **Subtask 13.3.1 – Regular Progress Reports and Invoicing**

Regular status reports and invoicing will be provided to the DOE as defined in the cooperative agreement.

##### **Subtask 13.3.2 – Topical Technical Reports**

Technical reports addressing specific topics of importance will be generated and submitted to DOE as required.

#### **Task 14.0 – Final Equipment Design and Process and Controls Engineering**

Phase III engineering work will primarily consist of completion of engineering to support equipment procurements and fabrication and completion of final design of the overall plant process and control systems.

#### **Task 15.0 - Procurement**

Remaining material and equipment specifications prepared under Phase II will be submitted to vendors for procurement.

#### **Task 16.0 – Construction Planning**

The Alliance will develop the Project Construction Schedule, Site Management, Labor and Safety Plans.

#### **Task 17.0 - Construction Management**

### **Subtask 17.1 - Construction Subcontracts Specifications**

Bids for installation of materials and equipment will be solicited in support of the project schedule. Upon receipt of material quantity details, specifications and commercial terms for all construction contracts will be prepared and Requests for Quotation released by procurement. Construction bids will be received and evaluated by the appropriate team members and vendor selections made to support the project budget and schedule.

### **Subtask 17.2 – Project Budget Updates**

Based on the responses from Subtask 17.1, a project construction estimate will be prepared. Continuous monitoring of financial performance against this initial estimate will be done.

### **Subtask 17.3 – Integrated Schedule**

Following selection of construction contractors, the project construction schedule will be updated to reflect the latest information from vendors.

## **Task 18.0 – Construction**

Following selection of installation contractors and upon receipt of all applicable permits, the construction of the project will commence. Installation will include but not be limited to, civil works, foundations, steel structures, coal feed system, boiler and ancillary equipment, flue-gas desulfurization scrubbers, particulate control devices, flues, flue gas coolers and heaters, ASU equipment, CPU equipment, piping, electrical equipment and controls.

A detailed construction plan and schedule will be developed in Phase III. The schedule will reflect WBS Level 5 activities where possible and will be maintained throughout the remainder of the project.

## **Task 19.0 - Commissioning**

Planning for an orderly and successful commissioning effort will be developed in Phase III.

### **Task 19.1 – Commissioning Planning**

A commissioning plan will be developed in Phase III to support the commissioning of equipment in the plant.

### **Task 19.2 - Commissioning**

Upon substantial completion of plant construction, the equipment commissioning will begin. Commissioning will include the initial check-out and operation of all components in the plant on an individual or subsystem basis. Verification of instrumentation, control loops and safety systems will be completed prior to operation of any equipment. Once all

essential components have been commissioned and the project deemed ready for operation, start-up activities will be initiated.

### **Task 20.0 - Start-up and Initial Testing**

Following commissioning and release of equipment packages to the plant operators, start-up activities will commence. The plant will be initially operated in the air-fired mode. Once air-fired operations are deemed successful and initial combustion and process controls tuning is complete, the unit will transition to oxy-combustion mode. Upon successful completion of operations and testing in the oxy-combustion mode, the unit will be raised to full load and normal plant operations will commence. CO<sub>2</sub> from the plant will be provided for initial start-up and testing of the CO<sub>2</sub> pipeline and storage facility. The Oxy-combustion Power Plant Project will coordinate with the CO<sub>2</sub> Pipeline and Storage Project regarding start-up and testing activities associated with the supply of CO<sub>2</sub> to the pipeline.

### **Task 21.0 – Initial Plant Operations**

Upon completion of plant start-up and initial testing, initial plant operations will begin.

### **Task 22.0 – Oxy-Combustion Test Program**

An oxy-combustion test program will be developed in Phase III.

### **Task 23.0 – Decision Point Application (for Phase IV)**

In accordance with the cooperative agreement, DOE's decision to authorize funding for Phase IV will be based in part on progress toward meeting the objectives of the project and includes an evaluation of the progress toward meeting the key milestones and deliverables. In particular, the following must be completed before DOE authorizes funding for Phase IV:

- Submission of Phase IV DPA
- All required environmental permits in place
- ASU construction
- Oxy-boiler island construction
- GQCS construction
- CPU construction
- Balance of plant construction
- Physical connection to the CO<sub>2</sub> Pipeline
- Plant commissioning
- Initial operations achieved, including:
  - Stable air-firing operations proven
  - Stable oxy-combustion operations proven
  - Maximum CO<sub>2</sub> flow on oxy-combustion proven
  - CO<sub>2</sub> available at the agreed-upon terms

**Subtask 23.1** – Consistent with the Topical Report format and instructions, the Alliance will prepare and submit a detailed technical Topical Report discussing the technical results of the work performed under the Phase III SOPO tasks. This report will be submitted to DOE no later than 60 days prior to the end of Phase III. In addition, the Alliance will submit a Phase IV DPA directly to the DOE Program Manager/Project Officer and the DOE Contract Specialist no later than 60 days prior to the end of Phase III.

**Subtask 23.2** – A report on the Alliance’s progress towards meeting the objectives of the project, including any significant findings, conclusions, or developments. Specific discussion and quantitative analysis (when applicable) will be presented regarding progress toward completion of key milestones identified for each project phase within this SOPO. The report shall include a discussion of the status of the Oxy-combustion Power Plant Project and the Alliance’s ability to meet its project objectives.

**Subtask 23.3** – A description of the Alliance’s plans for the conduct of the project during Phase IV. These plans will include:

**Subtask 23.3.1** – An updated SOPO that defines all work to be performed under Phase IV, showing detail at WBS Level 5, including detail for tasks and subtasks.

**Subtask 23.3.2** – A detailed budget and supporting justification for Phase IV. The budget will identify if additional funds are requested or a reduction of funds is anticipated. The Alliance will identify cash and in-kind contributions and include the basis for valuation of in-kind contributions.

**Subtask 23.3.3** – An updated PMP including the WBS; project schedule and milestone list; a Baseline Cost Plan on a monthly basis; a description of the project management system for monitoring and controlling scope, schedule, and cost including the plan for reporting earned value; a Project Communication Protocol; and a Risk Management Plan.

**Subtask 23.3.4** – An updated Project Funding Plan for the remainder of the project, showing sources and uses of funds.

**Subtask 23.3.5** – For each source of funding, audited financial statements for the last three years and any available financial statements for the current year.

**Subtask 23.3.6** – An updated financial model of the project, including a statement of revenues and expenses (income statement), balance sheet, and cash flow statement.

**Subtask 23.3.7** – A financial commitment letter from each funding source.

**Subtask 23.3.8** – Report any changes or modifications to the executed PPA(s), the CO<sub>2</sub> Off-take Agreement, and contracts with project partners and vendors.

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Include actual copies of contracts if available. The Alliance will provide the status of compliance with Davis Bacon Act requirements.

#### **4.0 Phase IV – Operations (7/1/2017 – 2/28/2022)**

Phase IV will include testing, data collection, and reporting on the on the operation and performance of the Oxy-combustion Power Plant Project.

During Phase IV, the Alliance will complete the following key milestones:

- Parametric testing
- End-of-project report
- Other reporting as established in the SOPO and the cooperative agreement

##### **Task 24.0 Project Management and Planning**

The Phase IV PMP will be updated to reflect any changes identified during the Phase III activities. The DOE Project Officer will be apprised of all changes that have occurred from the Phase III PMP. The Alliance will provide DOE with an updated PMP within 60-days after the Phase IV start date as specified in the cooperative agreement.

##### **Task 25.0 Parametric Testing**

Based on the testing plan developed in Phase III, the project will run the appropriate tests to determine the operating characteristics, plant performance, and plant efficiency when operating in the oxy-combustion mode. The safety record, operation, and maintenance of the facility will also be monitored and recorded during the test period to document the overall plant operating characteristics of the oxy-combustion process. The data and information gathered will be used to determine the overall success of meeting the established goals of the FutureGen 2.0 Program. The information will also be used to determine what improvements could be made to future units.

##### **Task 26.0 Reporting**

The Alliance will submit periodic and topical reports on the operation and performance of the project during the operations test period.

##### **Task 27.0 Final Report**

A final technical report will be prepared and submitted in accordance with the Federal Assistance Reporting Checklist and the instructions accompanying the checklist. The final report will summarize the administrative, programmatic, and technical accomplishments completed during the project and describe the work relative to project technical and design goals.

## **D. DELIVERABLES**

### **Federal Assistance Reporting Checklist and Other Reporting**

The Alliance will provide reports in accordance with the Federal Assistance Reporting Checklist and the instructions accompanying the checklist. For all technical reports required by the Federal Assistance Reporting Checklist, including Topical Reports and final reports, the Alliance will submit to the DOE Program Manager/Project Officer a draft report in electronic format for review and comment prior to submission to the official DOE document control system.

In addition to the reports identified on the checklist, at the appropriate time, the Alliance will provide the following:

- An EIV revised and updated as necessary
- PMP, updated at the end of each Phase
- Detailed test plans
- Test results reports
- Technology cost data
- Topical Reports and DPAs as specified in the SOPO and cooperative agreement
- Documentation to support the status and/or achievement of key milestones for each project phase

### **Final Reporting**

The final report will summarize the actual administrative, programmatic, and technical accomplishments completed during each phase and describe the work relative to project technical and design activities. The report will be prepared in accordance with the guidelines set forth in the Federal Assistance Reporting Checklist instructions of the cooperative agreement.

## **E. MEETINGS AND PROJECT BRIEFINGS**

The Alliance will prepare detailed briefings for presentation to the DOE Program Manager/Project Officer at the Program Manager/Project Officer's facility located in Morgantown, West Virginia, or at an alternate site as designated by the DOE Program Manager/Project Officer. Briefings will be given by the Alliance, and as appropriate project partners, to explain the plans, progress, and results of the technical effort at the completion of each phase and on an annual basis. Briefings will also include a kickoff meeting soon after a DOE decision to proceed to the next phase of the project.

[End of SOPO]

DOE F 4600.2

**ATTACHMENT 3 – FEDERAL ASSISTANCE REPORTING CHECKLIST  
AND INSTRUCTIONS  
U.S. Department of Energy**

(5/09)

All Other Editions are Obsolete

1. Identification Number: <b>DE-FE0005054</b>		2. Program/Project Title: <b>Recovery Act: FutureGen 2.0 - Oxy-combustion Large Scale Test</b>																																																																			
3. Recipient: FutureGen Industrial Alliance																																																																					
4. Reporting Requirements:	Frequency	No. of Copies	Addresses																																																																		
	<b>A. MANAGEMENT REPORTING</b> <input checked="" type="checkbox"/> Progress Report <input checked="" type="checkbox"/> Special Status Report  <b>B. SCIENTIFIC/TECHNICAL REPORTING *</b> (Reports/Products must be submitted with appropriate DOE F 241. The 241 forms are available at <a href="http://www.osti.gov/elink">www.osti.gov/elink</a> )  <table border="0"> <thead> <tr> <th align="left">Report/Product</th> <th align="left">Form</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> Final Scientific/Technical Report</td> <td>DOE F 241.3</td> <td>Q</td> <td rowspan="2">Electronic Version to NETL&gt;  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a></td> </tr> <tr> <td><input checked="" type="checkbox"/> Conference papers/proceedings/etc.*</td> <td>DOE F 241.3</td> <td>A</td> </tr> <tr> <td><input type="checkbox"/> Software/Manual</td> <td>DOE F 241.4</td> <td>FG</td> <td rowspan="3">Electronic Version to E-link&gt;  <a href="http://www.osti.gov/elink-2413">http://www.osti.gov/elink-2413</a> <a href="http://www.osti.gov/elink-2413">http://www.osti.gov/elink-2413</a> <a href="http://www.osti.gov/estsc/241-4pre.jsp">http://www.osti.gov/estsc/241-4pre.jsp</a></td> </tr> <tr> <td><input checked="" type="checkbox"/> Other (see special instructions) Topical</td> <td>DOE F 241.4</td> <td>A</td> </tr> <tr> <td><i>* Scientific/technical conferences only</i></td> <td>DOE F 241.3</td> <td>A</td> </tr> <tr> <td><b>C. FINANCIAL REPORTING</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> SF-425, Federal Financial Report</td> <td></td> <td>Q, FG</td> <td>Electronic Version To NETL&gt;  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a></td> </tr> <tr> <td><b>D. CLOSEOUT REPORTING</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Patent Certification</td> <td></td> <td>FC</td> <td rowspan="2">Electronic Version To NETL&gt;  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a></td> </tr> <tr> <td><input checked="" type="checkbox"/> Property Certificate</td> <td></td> <td>FC</td> </tr> <tr> <td><input type="checkbox"/> Other</td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>E. OTHER REPORTING</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Annual Indirect Cost Proposal</td> <td></td> <td>A</td> <td rowspan="2">Electronic Version To NETL&gt;  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a></td> </tr> <tr> <td><input checked="" type="checkbox"/> Annual Inventory Report of Federally Owned Property, if any</td> <td></td> <td>A</td> </tr> <tr> <td><input type="checkbox"/> Other</td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>F. AMERICAN RECOVERY AND REINVESTMENT ACT</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Reporting and Registration Requirements</td> <td></td> <td></td> <td><a href="http://www.federalreporting.gov">http://www.federalreporting.gov</a></td> </tr> </tbody></table>			Report/Product	Form			<input checked="" type="checkbox"/> Final Scientific/Technical Report	DOE F 241.3	Q	Electronic Version to NETL>  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a>	<input checked="" type="checkbox"/> Conference papers/proceedings/etc.*	DOE F 241.3	A	<input type="checkbox"/> Software/Manual	DOE F 241.4	FG	Electronic Version to E-link>  <a href="http://www.osti.gov/elink-2413">http://www.osti.gov/elink-2413</a> <a href="http://www.osti.gov/elink-2413">http://www.osti.gov/elink-2413</a> <a href="http://www.osti.gov/estsc/241-4pre.jsp">http://www.osti.gov/estsc/241-4pre.jsp</a>	<input checked="" type="checkbox"/> Other (see special instructions) Topical	DOE F 241.4	A	<i>* Scientific/technical conferences only</i>	DOE F 241.3	A	<b>C. FINANCIAL REPORTING</b>				<input checked="" type="checkbox"/> SF-425, Federal Financial Report		Q, FG	Electronic Version To NETL>  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a>	<b>D. CLOSEOUT REPORTING</b>				<input checked="" type="checkbox"/> Patent Certification		FC	Electronic Version To NETL>  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a>	<input checked="" type="checkbox"/> Property Certificate		FC	<input type="checkbox"/> Other				<b>E. OTHER REPORTING</b>				<input checked="" type="checkbox"/> Annual Indirect Cost Proposal		A	Electronic Version To NETL>  <a href="mailto:FITS@NETL.DOE.GOV">FITS@NETL.DOE.GOV</a>	<input checked="" type="checkbox"/> Annual Inventory Report of Federally Owned Property, if any		A	<input type="checkbox"/> Other				<b>F. AMERICAN RECOVERY AND REINVESTMENT ACT</b>				<input checked="" type="checkbox"/> Reporting and Registration Requirements		
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**FREQUENCY CODES AND DUE DATES:**

- A - As required; see attached text for applicability.
- FG - Final; within ninety (90) calendar days after the project period ends.
- FC - Final - End of Effort.
- Q - Quarterly; within thirty (30) calendar days after end of the calendar quarter or portion thereof.
- S - Semiannually; within thirty (30) calendar days after end of project year and project half-year.
- YF - Yearly; 90 calendar days after the end of project year.
- YP - Yearly Property - due 15 days after period ending 9/30.

**5. SPECIAL INSTRUCTIONS:**

- The forms identified in the checklist are available at [DOE Financial Assistance Forms Page](#). Alternate formats are acceptable provided the contents remain consistent with the form.
- See Federal Assistance Reporting Instructions on the following page.

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**Federal Assistance Reporting Instructions (2/09)**

**The Recipient must prepare and submit all scientific/technical reports (including conference papers/proceedings, journal articles, software, and topical reports, if applicable) via E-link at <http://www.osti.gov/mlink-2413> [see specific instructions below regarding form submittal and format]. If you have any technical problems with using E-Link or DOE Form 241.3, calls should be directed to OSTI at 865-576-1223. However, if your question is related to other submission issues, you should contact the DOE award administrator for the project.**

**For all other reports indicated on the “Federal Assistance Reporting Checklist” (including management, financial, closeout and other reporting), the Recipient must prepare and submit these via the internet at [FITS@NETL.DOE.GOV](mailto:FITS@NETL.DOE.GOV).**

Successful completion of this award is contingent upon submittal of the reports or items specified on the “Federal Assistance Reporting Checklist” in accordance with the following instructions:

Failure to follow these instructions can delay data entry of the report(s) into the **NETL FEDERAL INFORMATION TRACKING SYSTEM (FITS)** and result in the report being lost or considered delinquent.

The level of detail the Recipient provides in the reports must be commensurate with the scope and complexity of the effort and must be as delineated in the guidelines and instructions contained herein. The prime Recipient must be responsible for acquiring data from any contractors or sub recipients and ensuring that any information submitted is compatible with the requirements of the DOE.

**GUIDELINES FOR ELECTRONIC SUBMISSION AND FILE FORMAT OF NON-SCIENTIFIC/TECHNICAL REPORTS (includes management, financial, closeout and other reporting).**

Production of high-quality, electronic documents is dependent on the quality of the input that is provided. Thus, the Recipient must submit an electronic version of each report.

ELECTRONIC REPORTS MUST BE SUBMITTED IN THE ADOBE ACROBAT PORTABLE DOCUMENT FORMAT (PDF) AND BE ONE INTEGRATED PDF FILE THAT CONTAINS ALL TEXT, TABLES, DIAGRAMS, PHOTOGRAPHS, SCHEMATIC, GRAPHS, AND CHARTS. MATERIALS, SUCH AS PRINTS, VIDEOS, AND BOOKS, THAT ARE ESSENTIAL TO THE REPORT BUT CANNOT BE SUBMITTED ELECTRONICALLY, SHOULD BE SENT TO THE DOE ADMINISTRATOR. ELECTRONIC REPORTS SUBMITTED IN A FORMAT OTHER THAN ADOBE WILL BE RETURNED AND THE REPORT CONSIDERED DELINQUENT. IN ADDITION, THERE CAN BE NO RESTRICTIONS ON THE PDF FILE SUBMITTED THAT WOULD AFFECT OUR ABILITY TO OPEN OR EDIT THE REPORT DOCUMENT. THEREFORE, THE ONLY SECURITY METHOD THAT WILL BE ACCEPTED IS THE ADOBE ACROBAT “NO SECURITY” OPTION. THIS WILL ENABLE US TO PROPERLY INDEX AND PROCESS REPORT FILES.

The electronic file(s) must be submitted via the Internet at: [FITS@NETL.DOE.GOV](mailto:FITS@NETL.DOE.GOV). An e-mail message sent in conjunction with the file **must** contain the following information:

DOE Award Number  
Type of Report(s)  
Frequency of Report(s)  
Reporting Period (if applicable)  
Name of submitting organization  
Name, phone number and fax number of preparer

**A. MANAGEMENT REPORTING (See [Guidelines for Electronic Submission and File Format of Non-Scientific/Technical Reports](#))**

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## **PROGRESS REPORT**

The Progress Report must provide a concise narrative assessment of the status of work and include the following information:

1. The DOE award number and name of the recipient.
2. The project title and name of the project director/principal investigator.
3. Date of report and period covered by the report.
4. Executive Summary- A well organized summary that highlights the important accomplishments and new knowledge realized from the project during the reporting period. It should be no less than one page and no more than two pages in length, and should be single spaced. This summary must be more comprehensive than the traditional “abstract” and identify noteworthy advancements in research, design, manufacture or commercialization of technology developments. Also, summarize important breakthroughs that resolve critical science and technology risks or development barriers.
5. A discussion of what was accomplished under these goals during this reporting period, including major activities, significant results, major findings or conclusions, key outcomes or other achievements. This section should not contain any proprietary or classified data, or other information not subject to public release. If such information is important to reporting progress, **do not** include the information in this electronic report. Such information **MUST** be submitted in a separate hard-copy appendix to this report as explained under the **Supplemental Guidelines** below.

### **A suggested format is:**

**Approach** - this should describe, or reference all experimental, analytical and fabrication methods being used for the research and development efforts. It should also provide detail about materials and equipment being used. Standard methods can be referenced to the appropriate literature, where details can be obtained. Equipment should be described only if it is not standard, or if information is not available through the literature or other reference publications.

**Results and Discussion** - It is extremely important that this section includes enough relevant data, especially statistical data, to allow the project manager to justify the conclusions. With the relevant data, explain how the data was interpreted and how it relates to the original purpose of the research. Be concise in the discussion on how this research effort solved or contributed to solving the original problem. When investigation methods and/or procedures are being utilized for the first time, they must be described in detail. This description must contain detailed information on equipment and procedures utilized, as well as providing a rationale for their use and the accuracy of the method.

**Conclusion** - The conclusion should not simply reiterate what was already included in the “Results and Discussion” section. It should, however, summarize what has already been presented, and include any logical implications of how the successes are relevant to technology development in the future. This is extremely important, since “relevancy” continues to be a criterion of the program.

### **STATUS REPORTING:**

The following two sections of the Progress Report are to monitor uncosted obligations and project schedule/performance.

#### **6. COST STATUS**

The Cost Status reports the actual cost status of the award when compared with the original **Baseline Cost Plan** (i.e., the “Forecasted Cash Needs” originally provided on the SF-424A, Section D and as set forth in the Project Management Plan submitted with the Application and revised with Task 1.0 of SOPO).

The suggested format for the **Cost Plan/Status** follows:

**COST PLAN/STATUS**

Baseline Reporting Quarter	YEAR 1 Start:		YEAR 2 Start:		YEAR 3 Start:		End:						
	Q1 (From 424A, Sect. D)	Q2	Q3	Q4	Q5 (From 424A, Sect. E)	Q6		Q7	Q8	Q9	Q10	Q11	Q12
<b>Baseline Cost Plan</b> (from SF-424A)													
Federal Share													
Non-Federal Share													
Total Planned (Federal and Non-Federal)													
Cumulative Baseline Cost													
<b>Actual Incurred Costs</b>													
Federal Share													
Non-Federal Share													
Total Incurred Costs-Quarterly (Federal and Non-Federal)													
Cumulative Incurred Costs													
<b>Variance</b>													
Federal Share													
Non-Federal Share													
Total Variance-Quarterly (Federal and Non-Federal)													
Cumulative Variance													

Notes:

The Baseline Cost Plan is the “Forecasted Cash Needs” provided on the original SF- 424A, Section D for the current Budget Period (by Calendar Year Quarter) and will not be changed. If there are variances in the baseline, provide a brief analysis and recommendation.

Adjusting the baseline cost requires agreement of the DOE.

For Actual Incurred Costs, the recipient will insert the total amount of actual costs incurred for the quarterly period being reported, comprised of the DOE share and Recipient share.

The Variance is derived by subtracting the actual costs from the planned baseline costs, including an analysis explaining the variance.

## **7. SCHEDULE/MILESTONE STATUS**

The Schedule/Milestone Status measures changes in schedule or completion status of the originally anticipated (planned) milestones (as set forth in the Project Management Plan submitted with the Application and revised with Task 1.0 of SOPO) and their actual completion dates.

The Milestone Status will:

- (1) Identify a set of clearly stated project milestones (as contained under the Project Management Plan),
- (2) Clearly depict the actual progress achieved toward planned milestones,
- (3) Identify any individual milestone that was not met during the reporting period, and
- (4) Include a summary statement of the rationale for not meeting the milestone, a future date (Budget Period, calendar year and quarter) when the milestone will be met, the impact to the project of missing the milestone (i.e., schedule slippage, cost growth, other), and a plan to get back on schedule.

A suggested format for the Milestone Status is provided below:



8. Any changes in approach or aims and reasons for change. Remember significant changes to the objectives and scope require prior approval by the Contracting Officer.
9. Actual or anticipated problems or delays and actions taken or planned to resolve them. Identify any event causing a significant schedule slippage or cost growth; an environmental, safety, or health violation; or the achievement of or problems encountered for an important performance objective.
10. Any absences or changes of key personnel or changes in consortium/team arrangement.
11. A description of any product produced or technology transfer activities accomplished during this reporting period. Identify and describe any activities to transfer research results or developed technology to other research stakeholders or users of the technology, such as:
  - a. Identify publications (list journal name, volume, issue); conference papers; or other public releases of results as required for submission under Conference Papers/Proceedings and Journal Articles below.
  - b. Website or other Internet sites that reflect the results of this project.
  - c. Networks or collaboration fostered.
  - d. Technologies/Techniques.
  - e. Inventions/Patent Applications.
  - f. Other products, such as data or databases, physical collections, audio or video, software or netware, models, educational aid or curricula, instruments or equipment.
12. Earned Value Analysis

The Recipient shall report Earned Value data used for tracking schedule and cost performance of the project. Earned value is a project management tool which allows for the review of both the schedule and financial progress, as compared to the initial project plan.

The Recipient shall gather and record Earned Value Management (EVM) Data at the appropriate work breakdown structure level on a monthly basis. The Earned Value Analysis Report shall include EVM data as follows:

- Planned Value (PV) or Budgeted Cost of Work Scheduled (BCWS)
- Earned Value (EV) or Budgeted Cost of Work Performed (BCWP)
- Actual Cost (AC) or Actual Cost of Work Performed (ACWP)
- The Cost Performance Index (CPI) is calculated by dividing Earned Value by Actual Cost. (CPI= EV/AC)
- The Schedule Performance Index (SPI) is calculated by dividing Earned Value by Planned Value. (SPI=EV/PV)

The Planned Value (PV) is the cost budgeted for a given portion of planned work. The Actual Cost (AC) is the total of the funds actually spent for the work which was completed. The Earned Value (EV) is the budgeted or planned dollar value of the portion of work which was actually completed. The Cost Performance Index and Schedule Performance Index compare the planned dollar value of the portion of work actually completed with the actual cost for the work actually

completed, and the cost budgeted for the give portion of planned work, respectively.

EVM data shall be reported for the period and cumulative for the project. The baseline PV and AC incurred should be reported for the previous period. The projected PV versus EV for the upcoming month shall also be assessed. The Recipient shall provide the DOE summary level access/overview of the project management tool (e.g., Microsoft Project) at the Statement of Project Objectives task/subtask level in order to monitor project operations and status.

The Recipient shall use PV, EV, and AC used to assess the cost and schedule performance of the project by calculating and reporting the Cost Performance Index and the Schedule Performance Index. The Recipient shall provide an analysis of the project performance to date by assessing the Cost Performance Index and Schedule Performance Index, as shown below.

CPI >1 indicates that the project is under budget  
CPI =1 indicates that the project is on budget  
CPI <1 indicates that the project is over budget

SPI >1 indicates that the project is ahead of schedule  
SPI =1 indicates that the project is on schedule  
SPI <1 indicates that the project is behind schedule

### **SPECIAL STATUS REPORT**

The recipient must report the following events to the DOE Program Manager (identified in Block 15 of the Notice of Assistance Agreement Cover Page) by e-mail as soon as possible after they occur:

1. Developments that have a significant favorable impact on the project.
2. Problems, delays, or adverse conditions which materially impair the recipient's ability to meet the objectives of the award or which may require DOE to respond to questions relating to such events from the public. The recipient must report any of the following incidents and include the anticipated impact and remedial action to be taken to correct or resolve the problem/condition:
  - a. Any single fatality or injuries requiring hospitalization of five or more individuals.
  - b. Any significant environmental permit violation.
  - c. Any verbal or written Notice of Violation of any Environmental, Safety, and Health statutes.
  - d. Any incident which causes a significant process or hazard control system failure.
  - e. Any event which is anticipated to cause a significant schedule slippage or cost increase.
  - f. Any damage to Government-owned equipment in excess of \$50,000.
  - g. Any other incident that has the potential for high visibility in the media.
  - h. Any incident which causes a significant process or hazard control system failure, or is indicative of one which may lead to any of the above defined incidents, is to be reported as soon as possible, but within 5 days of discovery.

The e-mail correspondence should include:

1. Recipient's name and address;

2. Award title and number;
3. Date;
4. Brief statement of problem or event;
5. Anticipated impacts; and
6. Corrective action taken or recommended.

When an event results in the need to issue a written or verbal statement to the local media, the statement is to be cleared first; if possible, and coordinated with NETL Communications and Public Affairs Division, the DOE Project Officer and the Contracting Officer.

## **B. SCIENTIFIC/TECHNICAL REPORTING**

Scientific/Technical Reporting includes: Final Scientific/Technical Report, Topical Reports, Conference Papers/Proceedings, Software, and Journal Articles.

### **GUIDELINES FOR ELECTRONIC SUBMISSION AND ORGANIZATION OF FINAL SCIENTIFIC/TECHNICAL AND TOPICAL REPORTS**

Electronic Submission. The final scientific/technical report and topical reports must be submitted electronically via the DOE Energy Link System (E-Link) at <http://www.osti.gov/elink-2413>.

Electronic Format. REPORTS MUST BE SUBMITTED IN THE ADOBE PORTABLE DOCUMENT FORMAT (PDF) AND BE ONE INTEGRATED PDF FILE THAT CONTAINS ALL TEXT, TABLES, DIAGRAMS, PHOTOGRAPHS, SCHEMATIC, GRAPHS, AND CHARTS. ELECTRONIC REPORTS SUBMITTED IN A FORMAT OTHER THAN ADOBE WILL BE RETURNED AND THE REPORT CONSIDERED DELINQUENT. IN ADDITION, THERE CAN BE NO RESTRICTIONS ON THE PDF FILE SUBMITTED THAT WOULD AFFECT OUR ABILITY TO OPEN OR EDIT THE REPORT DOCUMENT. THEREFORE, THE ONLY SECURITY METHOD THAT WILL BE ACCEPTED IS THE ADOBE ACROBAT "NO SECURITY" OPTION. THIS WILL ENABLE US TO PROPERLY INDEX AND PROCESS REPORT FILES.

**Materials, such as prints, videos, and books, that are essential to the report but cannot be submitted electronically, should be sent to the DOE Award Administrator at the address listed in Block 16 of the Assistance Agreement Cover Page.**

Submittal Form. The report must be accompanied by a completed electronic version of **DOE Form 241.3, "U.S. Department of Energy (DOE), Announcement of Scientific and Technical Information (STI)."** You can complete, upload, and submit the DOE F.241.3 online via E-Link. You are encouraged not to submit Protected EAct Information in these electronic technical reports. These technical reports must also not contain any Limited Rights Data (such as trade secret, proprietary or business sensitive information), classified information, information subject to export control classification, or other information not subject to release. Such information **must** be submitted in a separate hard-copy appendix to the electronic technical and topical reports as explained under **Supplemental Guidelines** below.

Organization. The following sections should be included (as appropriate) in the final scientific/technical report and topical reports in the sequence shown. Any section denoted by an asterisk is **required** in all final technical and topical reports.

**TITLE PAGE\*** - The Title Page of the report itself must contain the following information in the following sequence:

- Report Title
- Type of Report (Final Scientific/Technical or Topical)
- Reporting Period Start Date
- Reporting Period End Date
- Principal Author(s)
- Date Report was Issued (Month [spelled out] and Year [4 digits])

DOE Award Number (e.g., DE-FG26-05NT12345) and if appropriate, task number  
Name and Address of Submitting Organization (This section should also contain the  
name and address of significant subcontractors/sub-recipients participating in the  
production of the report.)

**DISCLAIMER\*** -- The Disclaimer must follow the title page, and must contain the following  
paragraph:

“This report was prepared as an account of work sponsored by an agency of the United  
States Government. Neither the United States Government nor any agency thereof, nor  
any of their employees, makes any warranty, express or implied, or assumes any legal  
liability or responsibility for the accuracy, completeness, or usefulness of any  
information, apparatus, product, or process disclosed, or represents that its use would not  
infringe privately owned rights. Reference herein to any specific commercial product,  
process, or service by trade name, trademark, manufacturer, or otherwise does not  
necessarily constitute or imply its endorsement, recommendation, or favoring by the  
United States Government or any agency thereof. The views and opinions of authors  
expressed herein do not necessarily state or reflect those of the United States Government  
or any agency thereof.”

**ABSTRACT\*** - should be a brief, concise summary of the report.

**TABLE OF CONTENTS\***

**EXECUTIVE SUMMARY\*** - this should be a well organized summary that highlights the important  
accomplishments of the research during the reporting period. It should be no less than one page and no  
more than two pages in length, and should be single spaced. This summary must be more comprehensive  
than the traditional “abstract.”

**REPORT DETAILS** - The body of the final scientific/technical or topical report should address topics  
such as the following:

**Experimental methods:** Describe, or reference all experimental methods being utilized.  
Also provide detail(s) about materials and equipment used. Standard methods should  
reference the appropriate literature, where details can be obtained. Equipment should be  
described only if it is not standard, or if information is not available thru the literature or  
other reference publications.

**Results and discussions:** This section should include enough relevant data, especially  
statistical data, to allow the project manager to justify the conclusions. Explain how the  
data was interpreted and how it relates to the original purpose of the research. Be concise  
in the discussion on how this research effort solved or contributed to solving the original  
problem.

**Conclusion:** The conclusion should not simply reiterate what was already included in  
“Results and Discussion” but should summarize what has already been presented, and  
include any logical implications of how the successes are relevant to technology  
development in the future. This is extremely important, since “relevancy” continues to be  
a criterion of the program.

**GRAPHICAL MATERIALS LIST(S)**  
**REFERENCES**  
**BIBLIOGRAPHY**  
**LIST OF ACRONYMS AND ABBREVIATIONS**  
**APPENDICES (IF NECESSARY)**

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### **SUPPLEMENTAL GUIDELINES**

NETL cannot release technical reports that include Limited Rights Data (such as trade secret, proprietary or business sensitive information). Thus, if such information is important to technical reporting requirements, it **must** be submitted in a separate appendix to the electronic technical report. This appendix **MUST NOT** be submitted in an electronic format but rather submitted separately in **TWO GOOD QUALITY PAPER COPIES** when the electronic version of the sanitized technical report is submitted. The appendix must not be referenced in or incorporated into the sanitized technical report deliverable under the award. The appendix must be appropriately marked and identified. Only the legend provided in the Rights in Data clause in this award may be placed on the appendix. The appendix must be sent to:

**NETL AAD DOCUMENT CONTROL  
BUILDING 921  
U.S. DEPARTMENT OF ENERGY  
NATIONAL ENERGY TECHNOLOGY LABORATORY  
P.O. BOX 10940  
PITTSBURGH, PA 15236-0940**

Further, if this award authorizes the recipient under the provisions of The Energy Policy Act of 1992 (EPAct) to request protection from public disclosure for a limited period of time of certain information developed under this award, the main body of electronic technical reports **MUST NOT** contain such Protected Information. **TWO GOOD QUALITY PAPER COPIES** of such information must be submitted to the address above in a separate appendix to the sanitized electronic version of the technical report. The appendix must not be referenced in or incorporated into, the sanitized technical report deliverable under the award. In accordance with the clause titled "Rights in Data-Programs Covered Under Special Data Statutes," the appendix must be appropriately marked, including the date when the period of protection for the data ends. The EPAct appendix must be appropriately identified with the recipient's name, award number, type of report (final or topical), and reporting period start and end dates.

**Company Names and Logos** -- Except as indicated above, company names, logos, or similar material should not be incorporated into reports.

**Copyrighted Material** -- Copyrighted material should not be submitted as part of a report unless written authorization to use such material is received from the copyright owner and is submitted to DOE with the report.

**Measurement Units** -- All reports to be delivered under this instrument must use the SI Metric System of Units as the primary units of measure. When reporting units in all reports, primary SI units must be followed by their U.S. Customary Equivalents in parentheses ( ). **The Recipient must insert the text of this clause, including this paragraph, in all subcontracts under this award.** Note: SI is an abbreviation for "Le Systeme International d'Unites."

### **FINAL SCIENTIFIC/TECHNICAL REPORT**

The Final Scientific/Technical Report must document and summarize all work performed during the award period in a comprehensive manner. It must also present findings and/or conclusions produced as a consequence of this work. This report must not merely be a compilation of information contained in other reports, but must present that information in an integrated fashion, and shall be augmented with findings and conclusions drawn from the research as a whole.

### **CONFERENCE PAPERS/PROCEEDINGS AND JOURNAL ARTICLES**

**Content.** The recipient must submit a copy of any conference papers/proceedings, with the following information: (1) Name of conference; (2) Location of conference (city, state, and country); (3) Date of conference

(month/day/year); and (4) Conference sponsor.

**CONFERENCE PAPERS, PROCEEDINGS AND JOURNAL ARTICLES, GENERATED BY A SMALL BUSINESS OR NONPROFIT ORGANIZATION**

The Recipient must submit to DOE for review and approval all documents generated by the Recipient, or any subcontractor, that is not an educational institution, which communicate the results of scientific or technical work supported by DOE under this award, whether or not specifically identified in the award, prior to submission for publication, announcement, or presentation. The Recipient must submit to DOE for review and comment all documents generated by any subcontractor that is an educational institution. Such documents include conference papers, proceedings and journal articles. Upon completion of review, the DOE Project Officer will notify the Recipient of approval or recommended changes.

Electronic Submission. Scientific/technical conference paper/proceedings must be submitted electronically-via the DOE Energy Link System (E-Link) at <http://www.osti.gov/mlink-2413>. Non-scientific/technical conference papers/proceedings must be sent to the NETL Intranet address at: [FITS@NETL.DOE.GOV](mailto:FITS@NETL.DOE.GOV).

Electronic Format. Conference papers/proceedings must be submitted in the ADOBE PORTABLE DOCUMENT FORMAT (PDF) and be one integrated PDF file that contains all text, tables, diagrams, photographs, schematic, graphs, and charts.

Submittal Form. Scientific/technical conference papers/proceedings must be accompanied by a completed DOE Form 241.3. The form and instructions are available on E-Link at <http://www.osti.gov/mlink-2413>. This form is not required for non-scientific or non-technical conference papers or proceedings.

**OTHER**

**TOPICAL REPORTS**

Topical reports are intended to provide a comprehensive statement of the technical results of the work performed for a specific task or subtask of the Statement of Project Objectives, or detail significant new scientific or technical advances. The topical report format should follow the guidelines set forth above for technical reporting.

In addition to the Topical Reports required at each Decision Point (see SOPO), two Topical Reports (as a minimum) are required. The two required reports are the Public Preliminary Design Report and the Public Final Design Report. The purpose of the Public Design Reports is to consolidate for public use all available nonproprietary design information on the project. The Public Preliminary Design Report is based on the preliminary design information and is due at the end of Phase II. The Public Final Design Report is based on detailed design information and is due after completion of the Phase III. The Public Final Design Report should contain sufficient background information to provide an overview of the project and pertinent cost data. Since the scope of the reports is limited to nonproprietary information, their content will not be sufficient to provide a complete tool in designing a replicate plant. However, these reports will serve as a reference for the design considerations involved in a commercial-scale facility.

The reports should include an overview description of the technology and a summary of the mass and energy balances for the process. They should also define the overall process performance requirements and describe the evaluations and operating philosophies upon which those performance requirements are based. A summary cost estimate of capital and operating costs and, if possible, an analysis of how costs could be improved for future commercial projects should also be included.

The following deliverables are also to be included as components of the Public Preliminary Design Report addressing the preliminary design:

Process Flow Diagrams

The Participant shall provide a complete set of nonproprietary Process Flow Diagrams with all updates and modifications.

Stream Data

The Participant shall provide a complete set of all nonproprietary stream data. This would include both the expected values and ranges of flows, stream properties, and constituents at various operating conditions.

Equipment List

The Equipment List consists of a summary of the major equipment for the plant. Equipment is to be sorted by Flow Diagram, equipment type, and equipment number. General description data are to be provided for each equipment item, including, but not limited to, the number required for operation, size or capacity, major nonproprietary operating and design parameters, and manufacturer and/or vendor.

The Public Final Design Report shall include the final versions of the Public Preliminary Design Report plus the following:

Drawings

The Participant shall include a complete set of Equipment Plot and Elevation Drawings, and Process and Instrumentation Diagrams, which describe the plant configuration at the end of the demonstration period.

Plant Capital Cost Data

The Participant shall include the data and documentation for all projected costs associated with the construction of the plant, with a breakdown which would permit this information to be used for projecting future plant construction costs.

Plant Operating Cost Data

The participant shall include the data and documentation for all projected costs associated with the operation of the plant under conditions that represent reliable plant performance.

**PROTECTED PERSONALLY IDENTIFIABLE INFORMATION (PII)** Management Reports or Scientific/Technical Reports must not contain any *Protected PII*. PII is any information about an individual which can be used to distinguish or trace an individual's identity. Some information that is considered to be PII is available in public sources such as telephone books, public websites, university listings, etc. This type of information is considered to be Public PII and includes, for example, first and last name, address, work telephone number, e-mail address, home telephone number, and general educational credentials. In contrast, *Protected PII* is defined as an individual's first name or first initial and last name in combination with any one or more of types of information, including, but not limited to, social security number, passport number, credit card numbers, clearances, bank numbers, biometrics, date and place of birth, mother's maiden name, criminal, medical and financial records, educational transcripts, etc.

**C. FINANCIAL REPORTING**

Recipients must complete the SF-425as identified on the Reporting Checklist in accordance with the report instructions. The SF425A is not authorized for reporting under this award. A fillable version of the SF 425 form is available at [http://www.whitehouse.gov/omb/grants/grants\\_forms.aspx](http://www.whitehouse.gov/omb/grants/grants_forms.aspx).

**D. CLOSEOUT REPORTS**

**FINAL INVENTION AND PATENT REPORT**

The recipient must provide a DOE Form 2050.11, "PATENT CERTIFICATION." This form is available at <http://www.directives.doe.gov/pdfs/forms/2050-11.pdf> and [http://management.energy.gov/business\\_doe/business\\_forms.htm](http://management.energy.gov/business_doe/business_forms.htm).

### **PROPERTY CERTIFICATION**

The recipient must provide the Property Certification, including the required inventories of non-exempt property located at <http://www.management.energy.gov/documents/PropertyCertFINAL.doc>.

### **E. OTHER REPORTING**

#### **ANNUAL INDIRECT COST PROPOSAL AND RECONCILIATION**

**Requirement.** In accordance with the applicable cost principles, the recipient must submit an annual indirect cost proposal, reconciled to its financial statements, within six months after the close of the fiscal year, unless the award is based on a predetermined or fixed indirect rate(s), or a fixed amount for indirect or facilities and administration (F&A) costs.

**Cognizant Agency.** The recipient must submit its annual indirect cost proposal directly to the cognizant agency for negotiating and approving indirect costs. If the DOE awarding office is the cognizant agency, submit the annual indirect cost proposal to the address on the Reporting Requirements Checklist.

#### **ANNUAL INVENTORY OF FEDERALLY OWNED PROPERTY**

**Requirement.** If at any time during the award the recipient is provided Government-furnished property or acquires property with project funds and the award specifies that the property vests in the Federal Government (i.e. federally owned property), the recipient must submit an annual inventory of this property to the address on the Reporting Requirement Checklist no later than October 30<sup>th</sup> of each calendar year, to cover an annual reporting period ending on the preceding September 30<sup>th</sup>.

**Content of Inventory.** The inventory must include a description of the property, tag number, acquisition date, location of property, and acquisition cost, if purchased with project funds. The report must list all federally owned property, including property located at subcontractor's facilities or other locations.

### **F. AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (RECOVERY ACT) REPORTING**

Refer to the award term entitled, Reporting and Registration Requirements, of the Special Terms and Conditions for Grants and Cooperative Agreements for details on the reporting requirements under Section 1512 of the Recovery Act. The reports are due no later than ten calendar days after each calendar quarter in which the recipient receives the assistance award funded in whole or in part by the Recovery Act.

**ATTACHMENT 4 - BUDGET PAGES (Revised as of Amendment 014)**

**Budget Information - Non Construction Programs**

OMB Approval No. 0348-0044

Section A - Budget Summary							
Grant Program Function or Activity  (a)	Catalog of Federal Domestic Assistance Number  (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal  (c)	Non-Federal  (d)	Federal  (e)	Non-Federal  (f)	Total  (g)	
		1. FutureGen 2.0 - Phase 1	81.130			\$13,072,431	\$3,035,321
2. FutureGen 2.0 - Phase 2	81.130			\$99,766,951	\$1,007,747	\$100,774,698	
2a. FutureGen 2.0 - Phase 2a	81.130			\$3,294,307	\$33,276	\$3,327,583	
## FutureGen 2.0 - Phase 3	81.130			\$476,904,618	\$594,144,963	\$1,071,049,581	
4. FutureGen 2.0 - Phase 4	81.130			\$0	\$4,574,007	\$4,574,007	
5. Totals				\$589,744,000	\$602,762,038	\$1,192,506,038	
Section B - Budget Categories							
6. Object Class Categories	Grant Program, Function or Activity						
	(1) Phase I	(2) Phase 2	(2a) Phase 2a	(3) Phase 3	(4) Phase 4	(5) Total	
a. Personnel	\$987,761	\$454,567	\$13,240	\$2,420,793	\$0	\$3,863,121	
b. Fringe Benefits	incl. in personnel	\$104,550	\$3,446	\$556,782	\$0	\$661,332	
c. Travel	\$31,704	\$90,617	\$6,455	\$0	\$0	\$122,321	
d. Equipment	\$0	\$0	\$0	\$0	\$0	\$0	
e. Supplies	\$0	\$0	\$0	\$0	\$0	\$0	
f. Contractual	\$13,444,608	\$93,883,743	\$3,055,020	\$865,338,417	\$1,907,340	\$974,574,108	
g. Construction	\$0	\$0	\$0	\$0	\$0	\$0	
h. Other	\$880,361	\$1,476,221	\$1,508	\$187,792,589	\$0	\$190,149,171	
i. Total Direct Charges (sum of 6a-6h)	\$15,344,434	\$96,009,698	\$3,079,669	\$1,056,108,581	\$1,907,340	\$1,169,370,053	
j. Indirect Charges	\$763,318	\$4,765,000	\$247,913	\$14,941,000	\$2,666,667	\$23,135,985	
k. Totals (sum of 6i-6j)	\$33,257,580	\$100,774,698	\$3,327,582	\$1,071,049,581	\$4,574,007	\$1,192,506,038	
7. Program Income							

**Section C - Non-Federal Resources**

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) Totals
8. FutureGen 2.0 (81.130) - Phase I	\$3,035,321		\$0	\$3,035,321
9. FutureGen 2.0 (81.130) - Phase II	\$1,007,747			\$1,007,747
10. FutureGen 2.0 (81.130) - Phase III	\$594,144,963			\$594,144,963
11. FutureGen 2.0 (81.130) - Phase IV	\$4,574,007			\$4,574,007
12. Total (sum of lines 8 - 11)	\$602,762,038	\$0	\$0	\$602,762,038

**Section D - Forecasted Cash Needs**

	Total Forecasted	Cumulative Billed thru 1st Quarter	2nd Quarter	3rd Quarter	4th quarter
13. Federal	*	*	*	*	*
14. Non-Federal	*	*	*	*	*
15. Total (sum of lines 13 and 14)	*	*	*	*	*

**Section E - Budget Estimates of Federal Funds Needed for Balance of the Project**

(a) Grant Program	Future Funding Periods (Project Phases)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16. FutureGen 2.0 (81.130)	*	*	*	*
17.				
18.				
19.				
20. Total (sum of lines 16-19)				

**Section F - Other Budget Information**

21. Direct Charges	TBD	22. Indirect Charges	\$23,135,985
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23. Remarks:  
 \*See Project Management Plan and updates thereto.

**ATTACHMENT 5 – DEPARTMENT OF LABOR WAGE DETERMINATION(S)**

Reserved.

**ATTACHMENT 6 – COOPERATION AND TECHNOLOGY AGREEMENT**

Reserved.