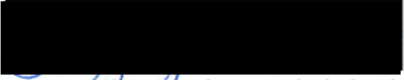



EXCEPTION TO SF 30, APPROVED BY NARS 5/79		1. CONTRACT ID CODE	PAGE 1 OF 2
<b>AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT</b>			
2. AMENDMENT/MODIFICATION NO. 553	3. EFFECTIVE DATE See box 16C.	4. REQUISITION/PURCHASE REQ. NO. NA27344	5. PROJECT NO. (If applicable)
6. ISSUED BY CODE		7. ADMINISTERED BY (If other than Item 6)	CODE
U.S. Department of Energy/NNSA SC M&O Contract Support Division P.O. Box 5400 Albuquerque, NM 87185-5400		U.S. Department of Energy/NNSA Livermore Site Office M/S L-293 7000 East Avenue Livermore, CA 94550	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, country, State, and ZIP Code)		9A. AMENDMENT OF SOLICITATION NO.	
Lawrence Livermore National Security, LLC Lawrence Livermore National Laboratory M/S L-019 7000 East Avenue Livermore, CA 94550			
		9B. DATED (SEE ITEM 11)	
		X 10A. MODIFICATION OF CONTRACT/ ORDER NO. DE-AC52-07NA27344	
		10B. DATED (SEE ITEM 13)	
CODE	FACILITY CODE	May 8, 2007	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS			
The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ___ is extended. ___ is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 25, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.			
12. ACCOUNTING AND APPROPRIATION DATA (If required) see attached			
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS , IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.			
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN CONTRACT/ORDER NO. IN ITEM 10A.			
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103 (b).			
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:			
X D. OTHER (Specify type of modification and authority) Modification pursuant to Contract Clause I.112, DEAR 970.5232-4 OBLIGATION OF FUNDS (DEC 2000)			
E. IMPORTANT: Contractor ___ is not, <u>X</u> is required to sign this document and return <u>2</u> copies to the issuing office.			
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) See attachment			
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.			
15A. NAME AND TITLE OF SIGNER (Type or print) Joseph (Trey) Johnston Director, Prime Contract Management		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) David P. Goett, Contracting Officer U.S. Department of Energy/NNSA	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
 (Signature of person authorized to sign)	8/13/15	 (Signature of Contracting Officer)	8/13/15

The first sentence of Paragraph (a), Clause I-112, is revised to read as follows: "(a) The amount presently obligated by the Government with respect to this contract is \$12,805,083,531.39 through modification 552."

The funds obligated by this action represent a net funding decrease of (\$20,623.10). The total amount now obligated by the Government with respect to this Contract is \$12,805,062,908.29. The Approved Funding Program 28, Part 3 is hereby incorporated by reference. The funding shall be distributed into the Obligation Control Levels as specified in Approved Funding Program 28.

In accordance with Clauses B-2, the Contractor is authorized for the period of October 1, 2014 to September 30, 2015 to withdraw in monthly installments and on the last day of each month, 1/12<sup>th</sup> of the annual Fixed Fee. The annual Fixed Fee amount is \$10,126,809.00. Additionally, the Contractor is authorized for the period of October 1, 2014 to September 30, 2015 to withdraw in monthly installments and on the last day of each month, 3% of the annual Maximum Available Performance Incentive Fee. The annual Maximum Available Performance Incentive Fee amount is \$23,629,220.00. Finally, the Contractor is authorized for the period of October 1, 2014 to September 30, 2015 to withdraw monthly installments and on the last day of each month, 1/12<sup>th</sup> the Maximum Available Fixed Fee collected from Reimbursable work. The estimated Maximum Available Fixed Fee from Reimbursable work is \$6,500,000 based on an estimated cost of \$260,000,000. The Transition Period was performed on a cost reimbursement no fee basis for the period of May 9, 2007 to September 30, 2007 and final payment was made on modification 206. The Transition Period is now closed.

**FUNDING SUMMARY SHEET  
LAWRENCE LIVERMORE NATIONAL SECURITY, LLC  
INTEGRATED CONTRACTOR  
AUGUST - FY 2015**

CONTRACTOR: LLNS  
 CONTRACT NO.: NA27344  
 MOD NO.: 553  
 AFP NO.: 28 (Part 3 of 3)  
 NOTE: ARRA FUNDING FOR PROJECT CODE 2010000.

	FUNDS OBLIGATED THROUGH AUGUST	CURRENT FUNDS OBLIGATED	FUNDS OBLIGATED SINCE INCEPTION OF CONTRACT
Transition Integrated Contractor	\$10,097,436.78	\$0.00	\$10,097,436.78
TOTAL	\$12,805,083,531.39	(\$20,623.10)	\$12,805,062,908.29

**Required Signatures:**

Processed: Renee M. Pacneco for Norma G. Dizon Date: 8/11/2015  
 Received: [Redacted] Date: 8-13-15  
 Approved: [Redacted] Date: 8/12/15

**Detail of Current Funds Obligated:**

Summary of ARRA Funding				
ARRA TAS	PROJECT CODE	PREVIOUS AMT	CHANGE AMT	CUMULATIVE AMT
8909/100331	2004190	\$3,049,061.12	\$0.00	\$3,049,061.12
8909/100331	2004040	\$121,868.64	\$0.00	\$121,868.64
8909/100211	2003010	\$4,148,471.28	\$0.00	\$4,148,471.28
8909/100336	2010000	\$3,347,286.64	(\$20,623.10)	\$3,326,663.54
8909/100227	2005410	\$2,500,000.00	\$0.00	\$2,500,000.00
8909/100227	2005410	\$2,562,506.00	\$0.00	\$2,562,506.00
8909/100227	2005365	\$180,508.30	\$0.00	\$180,508.30
8909/100227	2005290	\$409,919.41	\$0.00	\$409,919.41
8909/100227	2005290	\$399,207.94	\$0.00	\$399,207.94
8909/100227	2005250	\$745,640.79	\$0.00	\$745,640.79
8909/100227	2005270	\$694,147.34	\$0.00	\$694,147.34
8909/100227	2005270	\$591,187.82	\$0.00	\$591,187.82
8909/100227	2005060	\$744,785.03	\$0.00	\$744,785.03
Total:		\$19,494,590.31	(\$20,623.10)	\$19,473,967.21

\*\*\* Please include the required Budget POC identified above in the Approval Route of the STRIPES Requisition \*\*\*

Date: 8/11/2015

To: Melissa Odom/Kristen Leong M&O Contractor – (Lawrence Livermore National Security (LLNS))

Cc: N. Nicole Nelson-Jean Field Office Business Manager – (LFO)  
Homer Williamson Field Office Contracting Officer – (LFO)

From: Linda Sanchez NNSA Albuquerque Complex, M&O Support Dept.  
Renee Pacheco NA-MB-61 Designated Funds Certifying Official *Renee Pacheco*  
Frances Medina NA-MB-53 Budget Analyst (Phone#: 505-845-4005)

Subject: **Supplemental Approved Funding Program (AFP) – Funds Certification for ARRA Funds**

The following allotment is certified available for de-obligation and will be reflected in the 8/11/15 local AFP.

- Non-Full Funding Situation (i.e., Continuing Resolution)
- Full Funding Situation

	Funds Source #1	Funds Source #2
Reporting Entity	100038	
CID	NA27344	
Appropriation Year	2009	
TAS / STARS Fund Code	AQ - 899/100336	
B&R Control / OCL <sup>1</sup>	C002599	
B&R / STARS Program <sup>1</sup>	CJ0100000/3166012	
Program Task	2010000	
PRN / Local Use	0000000	
Object Class	25400	
Cost Center	0	
Dollar Amount	(20,623.10)	

Comments

(\$20,623.10) FY 2009 EERE - Energy Efficiency and Renewable Energy Programs, Energy Efficiency and Renewable Energy, Recovery Act funding. Project was finished; de-obligation of unspent funds. Recovery Act funds to be returned to HQ on local AFP released on August 11, 2015. Any requests for redistribution of these funds from the intended purpose and/or site must be requested and approved in writing from the Headquarters Program contact with a cc to: PPBE Management (Debbie Jones) and AWFOD Management (Renee Addison).

Include in Performance Measures (if not provide reason)

1. For Non-Full Funding situations the breakdown to reporting levels B&R / STARS Program value should be provided to Budget Analyst prior to next regularly scheduled AFP.

**U.S. DEPARTMENT OF ENERGY  
CONTRACT WORK AUTHORIZATION**

1a. Project Title: Catalytic Improvement of Solvent Capture Systems		1b. Work Proposal Number (if applicable): CFW0003
2. Headquarters Program Point of Contact: Name: Shane Kosinski      Organization Code: AR-1      Telephone No.: (202) 287-1010		
3. Headquarters Budget Point of Contact: Name: Hai Duong      Organization Code: AR-1      Telephone No.: (202) 287-6583		
4. Responsible Program: Advanced Research Project Agency - Energy		5. Responsible Secretarial Officer: Director, Advanced Research Projects Agency
6. Responsible Field Organization: Lawrence Livermore National Laboratory		
7a. Site and Facility Management Contractor: Lawrence Livermore National Laboratory		7b. Contractor Point of Contact: Name: Dr. Roger Aines Telephone No.: (925) 423-7184
8. Work Authorization Number: 09/CJ000/05/01		9. Revision Number: 03
10. Funds Authorized (\$). B&R Code: CJ01 Previous: \$3,332,000    Change: -\$20,623.10    Current: \$3,311,376.90		
11. Performance Period Covered by Funds. From: 2/19/09 To: <del>9/30/10</del> 12/31/2014	12. Work Start Date: Month/Year 09/2010	13. Expected Completion Date: Month/Year <del>09/2013</del> 12/31/2014
14. Statement of Work:  The term "Work Authorization" is defined as the following set of documents:		
U.S. Department of Energy Contract Work Authorization		(Pages 1-7)
Attachment 1	Contractor Recovery Act Technical Milestones and Deliverables	(Pages 8-14)
Attachment 2	Reporting Requirements	(Pages 15-38)
<p>This Work Authorization is issued for the sole purpose of authorizing work in support of the American Recovery and Reinvestment Act of 2009 (ARRA). All contract terms and conditions apply, except as provided in this Work Authorization. Work shall be performed using ARRA funds obligated under the contract, and, as such, is subject to special statutory conditions.</p> <p>On or about March 15, 2010, Lawrence Livermore National Laboratory (LLNL), along with The Board of Trustees of The University of Illinois (University of Illinois) and Babcock &amp; Wilcox (B&amp;W), submitted a full application to the Advanced Research Projects Agency – Energy (ARPA-E) in response to Funding Opportunity Announcement DE-FOA-0000208, IMPACCT. On or about April 28, 2010, ARPA-E selected the project described in LLNL's full application for funding. ARPA-E is funding the project described in LLNL's full application through this Work Authorization and a separate financial assistance award, DE-AR0000099, to University of Illinois and B&amp;W. The technical monitor for this Work Authorization is Dr. Mark Hartney, AR-1, <a href="mailto:mark.hartney@hq.doe.gov">mark.hartney@hq.doe.gov</a>.</p>		
<b>I. Project Definition</b>		
<p>The Project is defined as the combination of (i) the work described in this Work Authorization and (ii) the work described in ARPA-E financial assistance award DE- AR0000099. The work described in this Work Authorization is to be performed by LLNL. The work described in ARPA-E financial assistance award DE-AR0000099 is to be performed by University of Illinois and B&amp;W, subject to modification of the award by ARPA-E.</p>		
<b>II. Coordination and Management of Project</b>		
<p>LLNL shall coordinate and manage the Project in the manner described in this Work Authorization.</p>		
<b>III. Financial Reporting</b>		

**A. Financial Reports on Work Described in Work Authorization:**

Within 10 business days of a written request by ARPA-E, LLNL shall provide ARPA-E with a report on cumulative expenditures to date for the work described in this Work Authorization. The report must show cumulative expenditures to date for each of the following categories: salaries/wages and fringe benefits; equipment; travel; participant/training support costs, if any; other direct costs, including subawards/contracts; and indirect costs. Within 10 business days of a written request by ARPA-E, LLNL shall provide additional supporting documentation.

**B. Financial Reports on Project:**

On January 15, April 15, July 15, and October 15 of each year during the period of performance, LLNL shall provide ARPA-E with a report on cumulative (Federal and non-Federal) expenditures to date for the Project. The report must show cumulative expenditures to date for each of the following categories: salaries/wages and fringe benefits; equipment; travel; participant/training support costs, if any; other direct costs, including subawards/contracts; and indirect costs. Within 10 business days of a written request by ARPA-E, LLNL shall provide additional supporting documentation.

**C. Review of Financial Reports from University of Illinois and B&W:**

LLNL shall request and review reports from University of Illinois and B&W showing cumulative expenditures to date for the work described in ARPA-E financial assistance award DE- AR0000099. The reports must show cumulative expenditures to date for each of the following categories: salaries/wages and fringe benefits; equipment; travel; participant/training support costs, if any; other direct costs, including subawards/contracts; and indirect costs. LLNL shall request and review additional supporting documentation from University of Illinois and B&W, as appropriate.

**IV. Cost Share Reporting**

**A. Cost Share Obligations:**

The total project cost for the Project is \$4,810,505. LLNL shall pay 5.6 percent (or \$270,000) of the total project cost. University of Illinois shall pay 0.7 percent (or \$33,333) of the total project cost. B&W shall pay 18.2 percent (or \$875,172) of the total project cost. Total project Cost Share is 24.5 percent (\$1,178,505). University of Illinois and B&W are liable for their respective shares of total project cost incurred to date, even if the project is terminated or is not funded to completion.

**B. Cost Share Monitoring:**

LLNL shall monitor and verify University of Illinois and B&W's compliance with their cost share obligations. LLNL may use the financial reports and additional supporting documentation referenced in III.C above for this purpose.

**C. Cost Share Reporting:**

LLNL shall include in the financial reports referenced in III.B above verification that University of Illinois and B&W have fulfilled their cost share obligations to date. Within 10 business days of a written request by ARPA-E, LLNL shall provide additional supporting documentation.

**V. Program/Technical Reporting**

**A. Technical Milestones and Deliverables:**

LLNL shall achieve the technical milestones described in Attachment 1 to this Work Authorization by the dates

indicated therein. LLNL shall provide ARPA-E with the deliverables described in Attachment 1 to this Work Authorization by the dates indicated therein.

**B. Program/Technical Reports on Work Described in Work Authorization:**

Within 10 business days of a written request by ARPA-E, LLNL shall provide ARPA-E with a report on the program/technical work described in this Work Authorization. The report must show (i) the current status of work on each of the technical milestones and deliverables described in Attachment 1 to this Work Authorization and (2) the expected date for completion of each technical milestone and deliverable. Within 5 business days of a written request by ARPA-E, LLNL shall provide additional supporting documentation.

**C. Review of Program/Technical Reports from University of Illinois and B&W:**

LLNL shall request and review reports from University of Illinois and B&W showing (i) the timely achievement of the technical milestones described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099 and (ii) the timely submission of the deliverables described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099. LLNL shall request and review additional supporting documentation from University of Illinois and B&W, as appropriate. Within 5 business days of a written request from ARPA-E, LLNL shall provide such reports and additional supporting documentation to ARPA-E.

**D. Technical Milestone/Deliverables Monitoring:**

LLNL shall monitor and verify (i) University of Illinois and B&W's achievement of the technical milestones described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099, and (ii) University of Illinois and B&W's submission of the deliverables described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099, LLNL may use the program/technical reports and additional supporting documentation referenced in V.C above for this purpose.

LLNL shall hold monthly conference calls with University of Illinois and B&W to review its progress towards achievement of the technical milestones and deliverables described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099. Within 5 business days of a written request from ARPA-E, LLNL shall provide ARPA-E with any information or data received during the monthly conference calls.

LLNL shall attend meetings (in person) with University of Illinois and B&W at least two times each year during the period of performance to review its progress towards achievement of the technical milestones and deliverables described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099. Within 5 business days of a written request from ARPA-E, LLNL shall provide ARPA-E with any information or data received during the monthly conference calls.

**E. Program/Technical Reports on Project:**

On January 15, April 15, July 15, and October 15 of each year during the period of performance, LLNL shall provide ARPA-E with a report on the program/technical work for the Project. Such report shall conform to the requirements for quarterly reports described in Attachment 2 to this Work Authorization. Within 5 business days of a written request by ARPA-E, LLNL shall provide additional supporting documentation.

LLNL shall include in the program/technical report for the Project verification that University of Illinois and B&W (i) are achieving the technical milestones described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099 by the dates indicated therein and (ii) are submitting the deliverables described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099 by the dates indicated therein. Within 5 business days of a written request by ARPA-E, LLNL shall provide additional supporting documentation.

**F. ARPA-E Meetings and Conferences:**

LLNL's Principal Investigator and relevant program/technical personnel shall attend (in person) at least one

ARPA-E meeting in Washington, DC each year during the period of performance. ARPA-E will select the date for the meeting. During the meeting, LLNL's Principal Investigator and relevant program/technical personnel will present a report on (i) the current status of work on each of the technical milestones and deliverables described in Attachment 1 to this Work Authorization and Attachment 3 to ARPA-E financial assistance award DE- AR0000099, and (2) the expected date for completion of each technical milestone and deliverable. ARPA-E may provide input, comment, guidance, instruction, and direction on the coordination and management of the Project, the work described in Attachment 1 to this Work Authorization, and the work described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099.

LLNL's Principal Investigator and relevant program/technical personnel shall attend (in person) at least two ARPA-E site visits each year, during the period of performance. ARPA-E will select the dates for the meeting. During the meeting, LLNL's Principal Investigator and relevant program/technical personnel will present a report on (i) the current status of work on each of the technical milestones and deliverables described in Attachment 1 to this Work Authorization and Attachment 3 to ARPA-E financial assistance award DE- AR0000099, and (2) the expected date for completion of each technical milestone and deliverable. ARPA-E may provide input, comment, guidance, instruction, and direction on the coordination and management of the Project, the work described in Attachment 1 to this Work Authorization, and the work described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099.

LLNL's Principal Investigator and relevant program/technical personnel shall attend (by telephone or webinar) at least two ARPA-E meetings each year during the period of performance. ARPA-E will select the dates for the meetings. During the meeting, LLNL's Principal Investigator and relevant program/technical personnel will present a report on (i) the current status of work on each of the technical milestones and deliverables described in Attachment 1 to this Work Authorization and Attachment 3 to ARPA-E financial assistance award DE- AR0000099, and (2) the expected date for completion of each technical milestone and deliverable. ARPA-E may provide input, comment, guidance, instruction, and direction on the coordination and management of the Project, the work described in Attachment 1 to this Work Authorization, and the work described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099.

LLNL's Principal Investigator and relevant program/technical personnel shall attend (in person) at least one scientific/technical conference designated by ARPA-E each year during the period of performance. Upon request by ARPA-E, LLNL's Principal Investigator and relevant technical personnel shall participate as panelists and/or speakers at the conference.

#### G. Other Communications

In addition to the formal reports, presentations, meetings, and conferences described in this Work Authorization, ARPA-E expects to communicate by telephone and email with LLNL's program/technical personnel on a regular basis. LLNL's program/technical personnel shall reply to ARPA-E telephone calls and emails within 5 business days, to the maximum extent practicable. Upon request, LLNL's program/technical personnel shall participate in conference calls with ARPA-E regarding the Project. ARPA-E may provide input, comment, guidance, instruction, and direction on the coordination and management of the Project, the work described in Attachment 1 to this Work Authorization, and the work described in Attachment 3 to ARPA-E financial assistance award DE- AR0000099.

### VI. ARRA Reporting

#### A. ARRA Reporting for Work Described in the Work Authorization:

On January 10, April 10, July 10, and October 10 of each year during the period of performance, LLNL shall complete its ARRA reporting for the work described in this Work Authorization. Instructions for ARRA reporting are provided in Attachment 2 to this Work Authorization. Additional information and instructions can be found at the following locations: [http://energy.gov/recovery/ARRA\\_Reporting\\_Requirements.htm](http://energy.gov/recovery/ARRA_Reporting_Requirements.htm) and <https://www.federalreporting.gov/federalreporting/downloads.do>



ARPA-E requests LLNL to complete its ARRA reporting for the work described in this Work Authorization at least 3 days prior to this deadline (i.e., January 7, April 7, July 7, and October 7) to allow for reporting verification and to remedy any problems relating to the ARRA reports.

**B. Coordinate and manage ARRA Reporting from the University of Illinois and B&W.**

~~LLNL shall coordinate and manage the collection of all information and documents required for University of Illinois and B&W to timely complete its ARRA reporting for the work described in ARPA-E financial assistance award DE- AR0000099. LLNL shall provide such information and documents to University of Illinois and B&W at least 10 business days in advance of the reporting deadline.~~

**VII. Substantial Involvement**

ARPA-E will have substantial involvement in the coordination and management of the Project.

**A. Site Visits**

Within 10 business days of a written request by ARPA-E, LLNL shall provide ARPA-E reasonable access to the facilities and sites where the work described in the Work Authorization is being performed. LLNL shall provide reasonable resources and assistance requested or required by ARPA-E for safety, convenience, or other purposes. LLNL shall arrange meetings, presentations, tours, and/or demonstrations requested by ARPA-E. ARPA-E will provide advance notice of site visits, and minimize interference with ongoing work.

**B. Project Meetings**

LLNL shall provide ARPA-E with reasonable advance notice of and reasonable access to technical and project status meetings, reviews, tests, and demonstrations so as to allow ARPA-E to better understand the progress and challenges of the work performed under this Work Authorization. ARPA-E may participate in these meetings, reviews, tests, and demonstrations, and may provide input and comment. ARPA-E has no right of approval for these meetings, reviews, tests, and demonstrations.

**VIII. Publication**

ARPA-E encourages LLNL to publish or otherwise make publicly available the results of work performed under this Work Authorization.

Should LLNL publish or otherwise make publicly available the results of work performed under this Award, LLNL shall include the following acknowledgement and disclaimer.

**Acknowledgment:** "The information, data, or work presented herein was funded in part by the Advanced Research Projects Agency – Energy (ARPA-E), U.S. Department of Energy."

**Disclaimer:** "The information, data, or work presented herein was funded in part 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."

**IX. Performance of Work in the United States**

**A. U.S. Work Obligation:**

At least 90 percent of all work performed for this Project, measured as a percentage of the total project cost, must be performed in the United States (i.e., the United States proper and U.S. territories and insular possessions).

B. U.S. Work Monitoring:

LLNL shall ensure that the obligation in IX.A above is met for the Project. LLNL shall include in the financial reports described in III.B above verification that this obligation has been met to date.

X. Equipment Purchases

A. 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.

B. Purchase of U.S. Equipment

To the extent LLNL purchases new equipment to perform the work described in this Work Authorization, LLNL purchase equipment made or manufactured in the United States, to the maximum extent practicable.

XI. National Environmental Policy Act (NEPA) Compliance

A. NEPA Determination

The ARPA-E NEPA Compliance Officer has determined that the work described in this Work Authorization falls within categorical exclusion B3.6 of DOE's NEPA regulations (10 C.F.R. Part 1021).

B. Notification Obligations

In the event of any changes or modifications to the work described in this Work Authorization, LLNL shall notify the ARPA-E NEPA Compliance Officer (ARPA-E-Counsel@hq.doe.gov) in writing immediately. LLNL shall include in its notification: (i) the name and contact information (telephone number and email address) for the individual(s) to whom the ARPA-E NEPA Compliance Officer should direct any inquiries regarding this matter; and (ii) a detailed description of the changes or modifications to the work described in this Work Authorization.

B. Compliance Obligations

Within 10 business days of a written request from ARPA-E, LLNL shall provide information and documents required or requested by the ARPA-E NEPA Compliance Officer and his designee.

XII. Patent Costs

A. Payments for Patent Costs:

ARPA-E will not pay more than \$15,000 in costs and fees relating to the filing and prosecution of U.S. patent applications on subject inventions disclosed to ARPA-E and the U.S. Department of Energy. ARPA-E will not pay any costs and fees relating to the filing and prosecution of foreign patent applications.

B. Patent Cost Monitoring:

LLNL shall ensure that, for the Project as a whole, ARPA-E is not charged more than \$15,000 in costs and fees relating to the filing and prosecution of U.S. patent applications on subject inventions disclosed to ARPA-E and the U.S. Department of Energy. LLNL shall ensure that, for the Project as a whole, ARPA-E is not charged any costs and fees relating to the filing and prosecution of foreign patent applications.

**XIII. Intellectual Property Management Plan**

LLNL shall negotiate an intellectual property management plan with University of Illinois and B&W LLNL shall submit a completed and signed intellectual property management plan to ARPA-E within 90 days of the date of this Work Authorization.

**XIII. Termination**

ARPA-E may terminate this Work Authorization and/or discontinue funding under this Work Authorization for: (i) failure to achieve the technical milestones in Attachment 1 to this Work Authorization by the dates indicated therein; (ii) failure to submit the deliverables described in Attachment 1 to this Work Authorization by the dates indicated therein; (iii) failure to fulfill the reporting obligations described in this Work Authorization; (iv) failure to coordinate and manage this Project; (v) failure to fulfill the monitoring and verification obligations described in this Work Authorization; (vi) failure to fulfill the substantial involvement obligations in VII above; (vii) failure to fulfill the U.S. Work obligations in IX above; (viii) failure to fulfill the NEPA obligations in XI above; (ix) failure to fulfill the Patent Cost obligations in XII above; (x) failure to fulfill the IP Management Plan obligation in XIII above; and/or (xi) any other basis established by law or by contract.

**XIV. U.S. Competitiveness**

LLNL shall require, by written agreement, licensees or assignees of elected subject inventions to manufacture substantially in the United States any products embodying the elected subject inventions or produced through the use of the elected subject inventions if said products are used or sold in the United States.

Licensees or assignees may request DOE and ARPA-E to waive the U.S. manufacturing requirement. Such waiver requests must be accompanied by substantial evidence that it is not commercially feasible to comply with the U.S. manufacturing requirement. Such waiver requests shall require the concurrence of DOE and ARPA-E.

In the event DOE and ARPA-E agree to waive the U.S. manufacturing requirement, DOE and ARPA-E shall require recoupment of the Federal Government's investment (with interest) or other appropriate recognition of the Federal Government's support of the technology.

The above conditions shall be binding on any subsequent assignee or sublicensee of, or any entity acquiring rights to, any elected subject invention.

**15. Reporting Requirements (Status reports, scientific and technical information or similar):**

The recipient of funding in this Work Authorization is responsible for meeting all reporting requirements established by the Department of Energy for activities funded by the American Recovery and Reinvestment Act (ARRA) of 2009 and the reporting requirements outlined in Attachment 2.

16. Work Authorization Program Official. Name (typed): Hal Duong	Signature: [Redacted]	Date: 4/23/15
17. DOE Field Organization Official. Name (typed): [Redacted]	Signature: [Redacted]	Date: 4/28/2015
18. Contractor's Authorized Representative. Name (typed): [Redacted]	Signature: [Redacted]	Date: 5/11/15
19. DOE Contracting Officer (or delegated representative). Name (typed): David P. Goett Contracting Officer	Signature: [Redacted]	Date: 4/28/15