

To: Legacy Critique

From: Mark A. Million

Please scan the attached document (Modification 245), file in Sonar, and provide electronic copies to the following personnel:

Powell, Brenda G.; Shamblin, Diana Faye; Williams, Rhonda J.; Moore, Johnny O; Carter, Lisa B; Philipp, George J; Branton, M G; Kass, M J; Davis, Carolyn Marie; Lowery, Mary K.; Albaugh, Wayne H; Crow, Mary Lou; Fietze, Michael J; Mann, Deborah U; Solmonson, Debra Kay; jonescr@oro.doe.gov; Wilsonjn@oro.doe.gov; Johnsonmd@oro.doe.gov; and Million, Mark A.

If you have any questions, please call me at 576-4523.



Department of Energy

Oak Ridge Office
P.O. Box 2001
Oak Ridge, Tennessee 37831—

August 24, 2009

Mr. Michael J. Fietze, Director
Prime Contract Administration
UT-Battelle, LLC
P.O. Box 2008
Oak Ridge, TN 37831-6262

Dear Mr. Fietze:

CONTRACT NO. DE-AC05-00OR22725 - MODIFICATION NO. 245

A fully executed copy of the subject contract modification is enclosed for your retention. This modification obligates American Recovery and Reinvestment Act of 2009 funding as follows: 1) \$16,800,000 to the Work Authorization for the project entitled "EECBG Formula Grants Technical Assistance", 2) \$10,500,000 to the Work Authorization for the project entitled "Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies", and 3) \$3,100,000 to the Work Authorization for the project entitled "Energy-Intensive Processes R&D". The total amount of funds obligated under this contract since its inception is increased by \$30,400,000 from \$9,710,091,723.55 to \$9,740,491,723.55.

If you have any questions, please contact me at 576-4523.

Sincerely,

A handwritten signature in black ink that reads "Mark A. Million".

Mark A. Million
Contracting Officer

Enclosure

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES
			1 3
2. AMENDMENT/MODIFICATION NO	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
245	See Block 16C	09SC006327	
6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than Item 6)	CODE
Oak Ridge U.S. Department of Energy P.O. Box 2001 Oak Ridge TN 37831	00518	Oak Ridge U.S. Department of Energy P.O. Box 2001 Oak Ridge TN 37831	00518
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)		(x) 9A. AMENDMENT OF SOLICITATION NO	
UT-BATTELLE, LLC Attn: Michael J. Freitze, Director Prime Contract Administration Post Office Box 2008 OAK RIDGE TN 37831-6231		9B. DATED (SEE ITEM 11)	
CODE 099114287 FACILITY CODE		X 10A. MODIFICATION OF CONTRACT/ORDER NO. DE-AC05-00OR22725	
		10B. DATED (SEE ITEM 11)	
		10/18/1999	

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 15, 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 Page 3. Net Increase: \$30,400,000.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE 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 date, 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) 970.5232-4 OBLIGATION OF FUNDS (DEC 2000), P.L. 95-91, and P.L. 111-5

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ 0 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

Subj to Retent: N

Recovery TAS::89 0331::TAS

See Page 3.

Note: Information reflected on Page 2 is not relevant to this modification and may not be accurate. Please disregard Page 2.

Continued ...

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)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
		Mark A. Million	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		Mark A. Million (Signature of Contracting Officer)	8/24/09

NSN 7540-01-152-9070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

NAME OF OFFEROR OR CONTRACTOR
 UT-BATTELLE, LLC

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
00001	FOB: Destination Period of Performance: 04/01/2000 to 03/31/2010 Change Item 00001 to read as follows (amount shown is the total amount): MANAGEMENT AND OPERATION OF THE OAK RIDGE NATIONAL LABORATORY Incrementally Funded Amount: \$9,349,143,801.92				

Block 12 "ACCOUNTING AND APPROPRIATIONS DATA," continued.

Funds Obligated for Recovery Act Projects:

All required accounting and appropriations data, including the Treasury Accounting Symbol and Fund Code is hereby provided as Attachment 2 to this modification.

Block 14 "DESCRIPTION OF AMENDMENT/MODIFICATION," continued.

- A. This modification is issued to obligate American Recovery and Reinvestment Act (Recovery Act) of 2009 funds as follows: 1) \$16,800,000 to the Work Authorization for the project entitled "EECBG Formula Grants Technical Assistance", 2) \$10,500,000 to the Work Authorization for the project entitled "Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies", and 3) \$3,100,000 to the Work Authorization for the project entitled "Energy-Intensive Processes R&D".
- B. Accordingly, pursuant to Section I Contract Clause – DEAR 970.5232-4 entitled "Obligation of Funds," additional funds in the amount of \$30,400,000 are hereby obligated in support of Recovery Act activities. The total amount of funds obligated under this contract since its inception is increased from \$9,710,091,723.55 to \$9,740,491,723.55.
- C. The specific Contractor Recovery Act Statement of Work, Milestones, Outcomes and Measures, and Deliverables funded by this modification are identified in the following referenced Work Authorizations (Attachment 1):

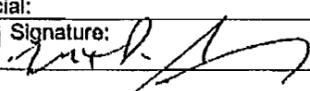
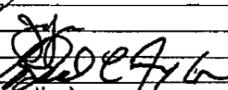
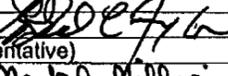
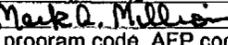
Work Authorization Number	Work Authorization Title
WA No. WI-470002-20458-09 (Initial, Rev1, & Rev2)	EECBG Formula Grants Technical Assistance
WA No. IF-470002-20421-09	Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies
WA No. IF-470002-20416-09	Energy-Intensive Processes R&D

(Numbers from Block 8 of the Work Authorizations)

- D. The work described in this modification shall be performed using funds obligated under this contract, which have been appropriated under the Recovery Act of 2009, (Pub. L. 111-5), and as such, is subject to the special statutory conditions and the additional contractual terms and conditions that are listed in section E below and previous contract modifications related to the Recovery Act. The funds obligated hereunder shall only be used to accomplish the work as set forth in section C above and may not be used for any other purpose without the prior written consent of the Contracting Officer.
- E. The Contractor shall complete all Recovery Act Work funded by this modification in accordance with Recovery Act requirements, including the required completion dates specified therein, and by the completion date identified in the approved work authorization for the activity.
- F. All other terms and conditions remain unchanged.

ATTACHMENT 1

WORK AUTHORIZATIONS

U.S. DEPARTMENT OF ENERGY CONTRACT WORK AUTHORIZATION			
1a. Solicitation/Project Title: EECBG Formula Grants Technical Assistance		1b. Work Proposal Number (if applicable): AOP# OR22725 ARRA	
2. Headquarters Program Point of Contact: Name: Dan Beckley Organization Code: Telephone No: (202) 586-7691			
3. Headquarters Budget Point of Contact: Name: Jay Schell Organization Code: Telephone No: (202) 586-0660			
4. Responsible Program: Office of Energy Efficiency and Renewable Energy		5. Responsible Secretarial Officer: Steve Chalk	
6. Responsible Field Element: Oak Ridge Operations Office			
7a. Site and Facility Management Contractor: University of Tennessee - Battelle (Oak Ridge National Laboratory)		7b. Contractor Point of Contact: Name: Patrick J. Hughes Telephone No: (865) 574-9337	
8. Work Authorization Number: * WI-470002-20458-09		9. Revision Number: 0	
10. Funds Authorized during FY 2009:			
<u>B&R Code</u>	<u>Previous</u>	<u>Change</u>	<u>Current</u>
WI1001020-05796-1005116 WCL → 8/24/2009	\$0	\$2,000,000	\$2,000,000
11. Performance period covered by funds: From: 10/1/2008 To: 9/30/2009 → 9/30/2012		12. Work Start Date: 10/1/2008 8/24/2009	13. Expected Completion Date: 9/30/2009 2012 WCL
14. Statement of Work: Funding in the amount of \$2,000,000 is authorized for EECBG Formula Grants Technical Assistance. These funds are made available for Project #20458 - EECBG Formula Grants Technical Assistance. These funds are to be distributed to Agreement # 19112-Energy Services Coalition Technical Assistance for SEP and EECBG ARRA 2009 in accordance with AOP# OR22725 ARRA. Provide state and local technical assistance to communities in support of recipients of the SEP and EECBG programs. The Project Code for this Activity is 2004350. Activities include developing, implementing and providing state performance contracting best practices and resources development in conjunction with other organizations. Specific activities include providing quick response to questions from Recovery Act applicants, establishing an infrastructure in state, local, and tribal governments that will build capacity on a self-sustaining basis, and providing technical services at workshops, webinars, and meetings. Funding provided in this work authorization is not approved for obligation of any type of support service contract either as a prime or subcontract award. The laboratory recipient of the funds is responsible for reporting all funding obligations and costs to headquarters. The laboratory recipient must maintain obligations and cost data at the agreement level and the data must be made available to EERE.			
15. Reporting Requirements: (Status reports, scientific or technical information or similar)			
16. Work Authorization Program Official:			
Name (typed): Gilbert P. Sperling, Program Manager	Signature: 	Date: 6/18/09	
17. DOE Field Organization Official:			
Name (typed): John	Signature: 	Date: 8/19/09	
18. Contractor's Authorized Representative:			
Name (typed): D.C. Christensen	Signature: 	Date: 8/19/09	
19. DOE Contracting Officer (or delegated representative)			
Name (typed): MARK A. MILLION	Signature: 	Date: 8/18/09	
* The work authorization number will consist of the program code, AFP code, solicitation/project id and the fiscal year.			

ATTACHMENT A – CONTRACTOR RECOVERY ACT PERFORMANCE REQUIREMENTS

Section A: Contractor Recovery Act Schedule or Milestone Requirements

The contractor shall award large SEP and EECBG Technical Assistance (TA) contracts by October 31, 2009. The metric and tracking system will be developed and implemented by January 31, 2010. Draft studies, reports and success stories will be begin by January 2011.

Section B: Contractor Recovery Act Performance Outcomes and Measures

The contractor will become proficient, knowledgeable and subject matter experts in SEP and EECBG TA. The contractor will develop, implement and manage technical assistance contracts for states, tribes and local governments. This will also include assistance and promotion of emerging and new energy efficient technologies to support market transformation, design assistance for new buildings and retrofits, energy modeling and demonstration support. Assistance and promotion opportunities will be identified through the technical assistance network established through awarded contracts. In addition, the contractor will develop, track and report metrics for TA activities at/through Oak Ridge National Laboratories (ORNL).

Section C: Contractor Recovery Act Deliverables

- Award TA contracts for SEP and EECBG
- Develop metric and tracking system
- Provide studies, reports, and success stories of TA activities

U.S. DEPARTMENT OF ENERGY CONTRACT WORK AUTHORIZATION			
1a. Solicitation/Project Title: EECBG Formula Grants Technical Assistance		1b. Work Proposal Number (if applicable): AOP# OR22725 ARRA	
2. Headquarters Program Point of Contact: Name: Mark Bailey Organization Code: Telephone No: (202) 586-9424			
3. Headquarters Budget Point of Contact: Name: Jay Schell Organization Code: Telephone No: (202) 586-0860			
4. Responsible Program: Office of Energy Efficiency and Renewable Energy		5. Responsible Secretarial Officer: Steve Chalk	
6. Responsible Field Element: Oak Ridge Operations Office			
7a. Site and Facility Management Contractor: University of Tennessee - Battelle (Oak Ridge National Laboratory)		7b. Contractor Point of Contact: Name: Michaela Martin Telephone No: (865) 574-8688	
8. Work Authorization Number: * WI-470002-20458-09		9. Revision Number: 1	
10. Funds Authorized during FY 2009:			
B&R Code	Previous	Change	Current
WI1001020-05796-1005116	\$0 \$2,000,000 <i>WCL</i>	\$4,000,000	\$4,000,000 <i>WCL</i> \$6,000,000 <i>WCL</i>
11. Performance period covered by funds: From: 10/1/2008 To: 9/30/2009 <i>2012</i>		12. Work Start Date: 7/1/2009 <i>8/24/2009</i> <i>WCL</i>	13. Expected Completion Date: 9/30/2010 <i>2012</i> <i>WCL</i>
14. Statement of Work: Funding in the amount of \$4,000,000 is authorized for EECBG Formula Grants Technical Assistance. These funds are made available for Project #20458 - EECBG Formula Grants Technical Assistance. These funds are to be distributed to Agreement # 19423-National Association of State Energy Officials (NASEO) Technical and Communications Support for EECBG ARRA. In accordance with AOP# OR22725 ARRA. Provide States with technical and communications support for EECBG. Activities include developing, implementing and providing a regional coordination structure to support state efforts and strategic program implementation of EECBG. Specific technical assistance to states will include program and project support of plans, communications, and innovative financing structures. Funding provided in this work authorization is not approved for obligation of any type of support service contract either as a prime or subcontract award. The laboratory recipient of the funds is responsible for reporting all funding obligations and costs to headquarters. The laboratory recipient must maintain obligations and cost data at the agreement level and the data must be made available to EERE.			
15. Reporting Requirements: (Status reports, scientific or technical information or similar) All work must be reported in compliance with the ARRA.			
16. Work Authorization Program Official: Name (typed): Gilbert P. Sperling, Program Manager Signature: <i>[Signature]</i> Date: 6/26/09			
17. DOE Field Organization Official: Name (typed): <i>John [unclear]</i> Signature: <i>[Signature]</i> Date: 8/15/09			
18. Contractor's Authorized Representative: Name (typed): D.C. Christensen Signature: <i>[Signature]</i> Date: 8/19/09			
19. DOE Contracting Officer (or delegated representative): Name (typed): MARK A. MILLION Signature: <i>Mark A. Million</i> Date: 8/18/09			
* The work authorization number will consist of the program code, AFP code, solicitation/project id and the fiscal year.			

ATTACHMENT A – CONTRACTOR RECOVERY ACT PERFORMANCE REQUIREMENTS

Section A: Contractor Recovery Act Schedule or Milestone Requirements

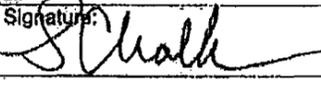
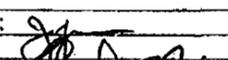
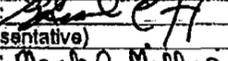
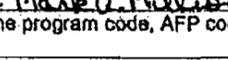
The contractor shall award large SEP and EECBG Technical Assistance (TA) contracts by October 31, 2009. The metric and tracking system will be developed and implemented by January 31, 2010. Draft studies, reports and success stories will be begin by January 2011.

Section B: Contractor Recovery Act Performance Outcomes and Measures

The contractor will become proficient, knowledgeable and subject matter experts in SEP and EECBG TA. The contractor will develop, implement and manage technical assistance contracts for states, tribes and local governments. This will also include assistance and promotion of emerging and new energy efficient technologies to support market transformation, design assistance for new buildings and retrofits, energy modeling and demonstration support. Assistance and promotion opportunities will be identified through the technical assistance network established through awarded contracts. In addition, the contractor will develop, track and report metrics for TA activities at/through Oak Ridge National Laboratories (ORNL).

Section C: Contractor Recovery Act Deliverables

- Award TA contracts for SEP and EECBG
- Develop metric and tracking system
- Provide studies, reports, and success stories of TA activities

U.S. DEPARTMENT OF ENERGY CONTRACT WORK AUTHORIZATION			
1a. Solicitation/Project Title: EECBG Formula Grants Technical Assistance		1b. Work Proposal Number (if applicable): AOP# OR22725 ARRA	
2. Headquarters Program Point of Contact: Name: Mark Bailey Organization Code: Telephone No: (202) 586-9424			
3. Headquarters Budget Point of Contact: Name: Jay Schell Organization Code: Telephone No: (202) 586-0680			
4. Responsible Program: Office of Energy Efficiency and Renewable Energy		5. Responsible Secretarial Officer: Steve Chalk	
6. Responsible Field Element: Oak Ridge Operations Office			
7a. Site and Facility Management Contractor: University of Tennessee - Battelle (Oak Ridge National Laboratory)		7b. Contractor Point of Contact: Name: Michaela Martin Telephone No: (865) 574-8686	
8. Work Authorization Number: * WI-470002-20458-09		9. Revision Number: 2	
10. Funds Authorized during FY 2009:			
B&R Code	Previous	Change	Current
WI1001020-05798-1005116	\$8,000,000 \$6,000,000 NCL	\$10,800,000	\$18,800,000 \$16,800,000 NCL
11. Performance period covered by funds: 12. Work Start Date: 13. Expected Completion Date:			
From: 4/1/2008 To: 9/30/2008 2012		10/1/2008	8/24/2009
			9/30/2009 2012 NCL
14. Statement of Work: Funding in the amount of \$10,800,000 is authorized for EECBG Formula Grants Technical Assistance. These funds are made available for Project #20458 - EECBG Formula Grants Technical Assistance. The Project Code for this Activity is 2004350. These funds are to be distributed to Agreement # 18423-National Association of State Energy Officials (NASEO) Technical and Communications Support for EECBG ARRA in accordance with AOP# OR22725 ARRA. Funding is provide to initiate and award a competitive solicitation for \$14 Million (\$8 Million provided herein and \$6 million dollars was sent previously to support this solicitation in Guidance Letters 09-10052S and 09-10087S). The four competitive solicitation areas of interest are: State and Local Infrastructure, Building Efficiency, Financial Mechanisms, and Program Design and Implementation. The remaining \$2.8 Million to ORNL for technical and management support. Funding provided in this work authorization is not approved for obligation of any type of support service contract either as a prime or subcontract award. The laboratory recipient of the funds is responsible for reporting all funding obligations and costs to headquarters. The laboratory recipient must maintain obligations and cost data at the agreement level and the data must be made available to EERE.			
15. Reporting Requirements: (Status reports, scientific or technical information or similar) Reporting must conform to ARRA requirements.			
16. Work Authorization Program Official:			
Name (typed): Steven Chalk, Principal Deputy Assistant Secretary		Signature: 	Date: 7/10/09
17. DOE Field Organization Official:			
Name (typed): John ...		Signature: 	Date: 8/19/09
18. Contractor's Authorized Representative:			
Name (typed): D.C. Christensen		Signature: 	Date: 8/19/09
19. DOE Contracting Officer (or delegated representative)			
Name (typed): MARK A. MILLION		Signature: 	Date: 8/18/09

* The work authorization number will consist of the program code, AFP code, solicitation/project id and the fiscal year.

ATTACHMENT A – CONTRACTOR RECOVERY ACT PERFORMANCE REQUIREMENTS

Section A: Contractor Recovery Act Schedule or Milestone Requirements

The contractor shall award large SEP and EECBG Technical Assistance (TA) contracts by October 31, 2009. The metric and tracking system will be developed and implemented by January 31, 2010. Draft studies, reports and success stories will be begin by January 2011.

Section B: Contractor Recovery Act Performance Outcomes and Measures

The contractor will become proficient, knowledgeable and subject matter experts in SEP and EECBG TA. The contractor will develop, implement and manage technical assistance contracts for states, tribes and local governments. This will also include assistance and promotion of emerging and new energy efficient technologies to support market transformation, design assistance for new buildings and retrofits, energy modeling and demonstration support. Assistance and promotion opportunities will be identified through the technical assistance network established through awarded contracts. In addition, the contractor will develop, track and report metrics for TA activities at/through Oak Ridge National Laboratories (ORNL).

Section C: Contractor Recovery Act Deliverables

- Award TA contracts for SEP and EECBG
- Develop metric and tracking system
- Provide studies, reports, and success stories of TA activities

U.S. DEPARTMENT OF ENERGY
CONTRACT WORK AUTHORIZATION

1a. Solicitation/Project Title: Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies		1b. Work Proposal Number (if applicable):	
2. Headquarters Program Point of Contact: Name: Isaac Chan Organization Code: EE-2F Telephone No: (202) 586-4981			
3. Headquarters Budget Point of Contact: Name: Shawn Mason Organization Code: Telephone No: (202) 586-8862			
4. Responsible Program: Office of Energy Efficiency and Renewable Energy		5. Responsible Secretarial Officer: Steve Chalk	
6. Responsible Field Element: Oak Ridge Operations Office			
7a. Site and Facility Management Contractor: University of Tennessee - Battelle (Oak Ridge National Laboratory)		7b. Contractor Point of Contact: Name: Craig Blue Telephone No: (865) 574-4351	
8. Work Authorization Number: * IF-470002-20421-09		9. Revision Number: 1	
10. Funds Authorized during FY 2009:			
<u>B&R Code</u>	<u>Previous</u>	<u>Change</u>	<u>Current</u>
ED1904032-05794-1004383	\$0	\$10,500,000	\$10,500,000
11. Performance period covered by funds: From: 9/15/2009 To: 9/30/2010 <i>mnr</i> 01/15/2009 <i>7/2009</i>		12. Work Start Date: 9/30/2010 <i>9/30/2011</i>	
13. Expected Completion Date: 9/30/2010 <i>9/30/2011</i>		14. Statement of Work: <i>8/17/09 - 9/30/2011 mnr</i>	
Funding in the amount of \$10,500,000 is authorized for Industrial Materials of the Future. These funds are made available for Solicitation #20421 - Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies. Funding for this activity will expand collaborative activity to accelerate the transition of scientific discoveries into industrial application. This funding will support efforts in two primary areas: 1) Unfunded R&D Projects - This activity will initiate R&D projects which cannot be funded with normal program funding. This enables investment in new technology projects that have been recommended for selection by merit review committees of competitive solicitations, but not funded due to lack of program funding. Funding in this area will support research and demonstration projects in the areas of nanomanufacturing (13 projects), utilization of opportunity fuels in industrial processes (7 projects), combined heat and power R&D (2 projects), and efficient technologies for energy-intensive processes (4 projects). 2) Materials/Manufacturing Technology - ORNL will issue an RFP for advancement of materials/manufacturing technology. Focus areas will be strategic materials such as titanium and magnesium, structural materials such as high temperature steels; energy storage and production materials; and advanced/field/transient processing technologies. This project area is crosscutting by supporting manufacturing needs of hydrogen, wind, solar, vehicles, and biomass technologies. Funding provided in this work authorization is not approved for obligation of any type of support service contract either as a prime or subcontract award. The field AFP recipient of the funds is responsible for reporting all funding obligations and costs to the Program Management Center and headquarters. The field AFP recipient must maintain obligations and cost data at the agreement level and the data must be made available to EERE.			
15. Reporting Requirements: (Status reports, scientific or technical information or similar)			
16. Work Authorization Program Official:			
Name (typed): Jacques Beaudry-Losique, Deputy Assistant Secretary	Signature: <i>J. Beaudry-Losique</i>	Date: 7/17/09	
17. DOE Field Organization Official:			
Name (typed): <i>Johan Mason</i>	Signature: <i>Johan Mason</i>	Date: 8/13/09	
18. Contractor's Authorized Representative:			
Name (typed): <i>D.C. Christensen</i>	Signature: <i>D.C. Christensen</i>	Date: 8/14/09	
19. DOE Contracting Officer (or delegated representative)			

Name (typed): MARK A. MILLION Signature: Mark A. Million Date: 8/13/09
* The work authorization number will consist of the program code, AFP code, solicitation/project id and the fiscal year

FED 09-6076 AFP Jul

ATTACHMENT A – CONTRACTOR RECOVERY ACT PERFORMANCE REQUIREMENTS

Section A: Contractor Recovery Act Schedule or Milestone Requirements

Task 1 - Commercialization of Titanium Heat Exchangers Fabricated from New Powders.
Milestone 5.1 Complete and install at least one heat exchanger system with cold formed Ti sheets for evaluation at a company site for testing and evaluation in a test loop system; Month 19
Task 2 - Shear Rolling of Magnesium Sheet for Energy, Transportation, and Defense Applications.
Milestone 5.1: Successfully fabricate component 1 using materials fabricated through new processing technology; Month 21
Task 3 - Commercialization of New Carbon Fiber Materials Based on Sustainable Resources for Energy Applications. Milestone 3.2 Demonstration of scaled up production of carbon materials for energy storage application; Month 19
Task 4 - AFA Steels. Milestone 2.4 Report relative performance of AFA steels in four application relevant environments; Month 24
Task 5 - CF8C-Plus Cast Stainless Steels. Milestone 4.1 Report on the potential for cast AFA components based on creep and environmental resistance; Month 22
Task 6 - Materials & Processing for Advanced Batteries. Milestone 4.1 Scaling of processing; Month 25
Task 7 - Photovoltaic Materials. Milestone 1.7 Third round research completed; Month 20
Task 8 - Magnetic Processing of Steel Strip and Next Generation Alloys. Milestone 4.1 Develop process parameters for continuous feed production line that includes a TMP magnetic processing stage; Month 19

Section B: Contractor Recovery Act Performance Outcomes and Measures

All tasks described under this effort will be completed by 9-30-2011, within the budget allocated to each task. Completion of each task will be determined by the submission of a final task report to the sponsor's designated representative.

Section C: Contractor Recovery Act Deliverables

Task 1 - Commercialization of Titanium Heat Exchangers Fabricated from New Powders.
Deliverable, Final Report
Task 2 - Shear Rolling of Magnesium Sheet for Energy, Transportation, and Defense Applications.
Deliverable, Final Report
Task 3 - Commercialization of New Carbon Fiber Materials Based on Sustainable Resources for Energy Applications.
Deliverable, Establish Commercialization Plans
Task 4 - AFA Steels.
Deliverable, Completed evaluation of as-cast AFA steel properties for cast components.
Task 5 - CF8C-Plus Cast Stainless Steels.
Deliverable, Completed evaluation of slurry-coated CF8C-Plus steel properties
Task 6 - Materials & Processing for Advanced Batteries.
Deliverable, Develop deposition and drying procedure for lithium ion battery coatings (electrodes and ceramic composite separators) maintaining nano-scale feature and lab-scale performance
Task 7 - Photovoltaic Materials.
Deliverable, Final Report
Task 8 - Magnetic Processing of Steel Strip and Next Generation Alloys.
Deliverable, Final Report

U.S. DEPARTMENT OF ENERGY CONTRACT WORK AUTHORIZATION			
1a. Solicitation/Project Title: Energy-Intensive Processes R&D		1b. Work Proposal Number (if applicable): AOP# tbd, AOP# tbd, AOP# tbd, AOP# tbd, AOP# tbd, AOP# tbd, AOP# tbd, AOP# tbd, AOP# tbd	
2. Headquarters Program Point of Contact: Name: Isaac Chan Organization Code: EE-2F Telephone No: (202) 586-4981			
3. Headquarters Budget Point of Contact: Name: Shawn Mason Organization Code: Telephone No: (202) 586-8862			
4. Responsible Program: Office of Energy Efficiency and Renewable Energy		5. Responsible Secretarial Officer: Steve Chalk	
6. Responsible Field Element: Oak Ridge Operations Office			
7a. Site and Facility Management Contractor: University of Tennessee - Battelle (Oak Ridge National Laboratory)		7b. Contractor Point of Contact: Name: Craig Blue Telephone No: (865) 574-4351	
8. Work Authorization Number: * IF-470002-20416-09		9. Revision Number: 0	
10. Funds Authorized during FY 2009 :			
B&R Code	Previous	Change	Current
ED1908000-05794-1004889	\$0	\$3,100,000	\$3,100,000
11. Performance period covered by funds: From: 8/29 2009 To: 9/30/2012		12. Work Start Date: 8/29 2009	13. Expected Completion Date: 9/30/2012
14. Statement of Work: Funding in the amount of \$3,100,000 is authorized for Energy-Intensive Process R&D. These funds are made available for Project #20416 - Energy-Intensive Processes R&D. These funds are to be distributed amongst Agreement # 18974-Architected Nanomembranes for In-Situ Energy Conversion in accordance with AOP# tbd; Agreement # 18977-Nanocatalytic conversion of biomass into second-generation biofuels in accordance with AOP# tbd; Agreement # 18979-Oxide-Nanoparticle Containing Coatings for High Temperature Alloys in accordance with AOP# tbd; Agreement # 18980-Synthesis of Highly Ordered TiO2 Nanotubes Using Ionic Liquids for Photovoltaics in accordance with AOP# tbd; Agreement # 18981-Development and Application of Processing for Nano-Composite Materials for Lithium Ion Batteries in accordance with AOP# tbd; Agreement # 18983-Pulsed Thermal Processing of Self-Assembled Quantum Dot Structures in accordance with AOP# tbd; Agreement # 18984-Mesoporous Carbon Membranes for Selective Gas Separations in accordance with AOP# tbd; Agreement # 18985-Nanocrystallization of LiCoO2 Cathodes for Thin Film Batteries in accordance with AOP# tbd; Agreement # 18991-Improving Heat Recovery in Biomass-Fired Boilers in accordance with AOP# tbd. Agreement: 18974; Architected Nanomembranes for In-Situ Energy Conversion -This one year, concept definition study will consist of engineering concept studies and lead to an analysis of the technological and economic impacts of a unique architecture in nanocomposites membranes. This project builds upon the proof-of-principle results of an ORNL seed money project, which demonstrated a 4-5 orders of magnitude enhancement in oxygen ionic conductivity for a solid state electrolyte membrane having nanochannel architecture. The nanoscale host-guest architecture contains oriented interfaces between nanotube/nanowire arrays perpendicular to the membrane layer. Membrane nanostructure determines the performance of a fuel cell, and also possibly, solar cell, thermoelectric devices and catalytic membrane reactors. These nanomembrane-based devices and technologies provide significant energy, carbon, and economic benefits, which will also be evaluated to better define R&D paths for commercialization. ARRA Project Code: 2004320 Agreement: 18977; Nanocatalytic conversion of biomass into second-generation biofuels -This concept definition project will focus on the potential for nanocatalysis in playing a significant role in the development of efficient processes for biomass conversion into biofuels. Second-generation biofuels (i.e., those from catalytic conversion of lingo-cellulosic biomass/wastes) serve as alternatives to gasoline and diesel fuels and offer great benefits in both energy and carbon. This project proposes to investigate the use of clay-based nanocatalysts to facilitate the breakdown of refractory organics from unconventional sources: primarily from lignin, but also from bitumen and oil shale into feedstocks that can be used for transportation fuels and for the chemical industry. Advances in the use of clay minerals as economical catalysts will be coupled with the advantages posed by nanomaterials to greatly enhance the efficiency and economics of the processing of			

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refractory materials. In particular, lower temperature conversions and more rapid processing is predicted from the use of nanotechnology in this area. In particular, this study will focus on economical, naturally abundant clay-based layered nanocatalysts, and will evaluate issues related to production of the nanocatalysts and their performance in reducing waste and energy usage in the production of biofuels and chemicals from renewable sources. ARRA Project Code: 2004320 Agreement: 18979; Oxide-Nanoparticle Containing Coatings for High Temperature Alloys -The focus of the proposed work is to examine the fabrication of high temperature alloy coatings containing oxide nanoparticles. Use of oxide dispersion strengthened (ODS) alloys will enable achieving desired high temperature strength while avoiding problems with fabrication of components using these alloys. It is proposed that an optical technique, such as a laser or an infrared plasma arc lamp, will be used to rapidly heat particles sprayed onto the surface while electromagnetic stirring will be used to stir the molten pool to prevent agglomeration and floating of nanoparticles. The key and novelty in the process is the use of electromagnetic stirring. It is anticipated that this approach can be extended to the processing of bulk nanocomposite materials using optical techniques and to other wear and corrosion resistant coating with nanoparticles. ARRA Project Code: 2004320 Agreement: 18980; Synthesis of Highly Ordered TiO₂ Nanotubes Using Ionic Liquids for Photovoltaics -The major objective of this project is to conduct a one-year concept definition study to develop a unique technique for synthesizing highly ordered TiO₂ nanotubes using ionic liquids for photovoltaic (PV) applications, including dye sensitized solar cells and water splitting for hydrogen production. This project is based on a unique ionic liquid-based electrolytes technology. The scope of the project includes; 1) synthesis of highly ordered TiO₂ nanotubes using ionic liquids, 2) nanostructural characterization, 3) understanding synthesis mechanisms, and 4) evaluating PV characteristics. ARRA Project Code: 2004320 Agreement: 18981; Development and Application of Processing for Nano-Composite Materials for Lithium Ion Batteries -This project intends to develop optimized processing, process control and quality measures for a homogenous and reliable deposition and treatment of nano-composite coatings to be used in lithium ion battery technology with guidelines for scale-up and mass production of the product. It will develop fundamental understanding of the nanomaterial behavior, the process mechanisms, and the resulting functionality. It will integrate a quality control approach with science and technology to produce a reliable product and enable lithium ion battery technology for transportation and stationary applications. The primary purpose of the proposed effort is to advance the state of the nanomanufacturing of this nano-composite material for Li-ion batteries such that improvement in reliability in the material and in its production will be enabled and the scale-up of the technology will become feasible. ARRA Project Code: 2004320 Agreement: 18983; Pulsed Thermal Processing of Self-Assembled Quantum Dot Structures -The use of quantum dot (QD) materials for solid state lighting and photovoltaic applications are hindered by the ability to distribute QD across a substrate and produce an ordered structure. The overall objective of this research is to develop large scale manufacturing processes to encourage the self-assembly of QD structures and to incorporate broad area thermal annealing to decrease material defects. The first objective is to demonstrate self-assembly techniques for synthesizing a QD structure using long-chain molecules to bind the QD's into dimmer and trimer structures. Through preliminary research, it has been shown that the photoluminescence intensity of the QD structure can be increased by five times by correctly controlling the spacing between the QD's. The second objective is to use pulsed thermal processing to thermally anneal the QD structure without damaging the long range order or the inter-particle spacing. It has been demonstrated that short duration thermal annealing can increase the photoluminescence intensity by an order of magnitude by reducing the number of point defects that act as non-radiative recombination centers for electron-hole pairs. Overall, it is expected the combined effects of advanced synthesis and broad area thermal annealing will increase the efficiency of the QD structures by 50 to 100 times. ARRA Project Code: 2004320 Agreement: 18984; Mesoporous Carbon Membranes for Selective Gas Separations -This project is focused on translating a novel class of material developed at Oak Ridge National Laboratory - self-assembled mesoporous carbon - into robust, efficient membrane systems for selective industrial gas separations. These tailorable, nanostructured materials, described in US Patent Application 2006057051, "Highly ordered porous carbon materials having well defined nanostructures and method of synthesis," consist of ordered mesopores and tunable micropores that are ideally sized for high throughput separation of gaseous species, such as O₂, CO₂, and gaseous alkanes. The carbon is synthesized by conventional chemical and materials processing approaches, which provides promise for cost effective production of precision separations materials at large scale. The project, which will involve collaboration with the research group of W.J. Koros of Georgia Institute of Technology, will consist of stage 2 R&D. The project aims to develop supported mesoporous carbon membranes in the pores of anodized commercial alumina membranes for high-flux, high-selectivity separations. Recent preliminary tests have shown excellent selective transport of carbon dioxide and propylene relative to other gases. CFO Project Code: 2004320 Agreement: 18985; Nanocrystallization of LiCoO₂ Cathodes for Thin Film Batteries -The inherent difficulty of achieving high performance thin film batteries (TFB) is that they must undergo a post-deposition critical heat treatment that limits the substrate material to those that can withstand the processing environment. Thus, low temperature flexible polymer substrates cannot be utilized with conventional processing methods for these types of devices. The TFB's that are fabricated on flexible polymer substrates are limited in their performance due to the lack of the critical high temperature annealing step, which is required for optimal performance. Pulse Thermal Processing (PTP) with its unique high power densities (>20,000 W/cm²), short processing time (millisecond regime) and large

processing area (up to 1,000 cm²) is able to accomplish the required high temperature anneals of these types of material systems on flexible temperature-sensitive substrates including polymers without thermally affecting the underlying material, thus enabling a high performance flexible TFB on a polymer substrate. ARRA Project Code: 2004320 Agreement: 18991; Improving Heat Recovery in Biomass-Fired Boilers This agreement aims to identify and/or develop advanced materials, coatings and heat transfer technologies to optimize the performance of heat recovery components in biomass-fired boilers. The project addresses Waste Heat Recovery Systems area of the Waste Heat Minimization and Recovery Platform of the Energy Intensive Processes. ARRA Project Code: 2004320. Funding provided in this work authorization is not approved for obligation of any type of support service contract either as a prime or subcontract award. The laboratory recipient of the funds is responsible for reporting all funding obligations and costs to headquarters. The laboratory recipient must maintain obligations and cost data at the agreement level and the data must be made available to EERE.

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

16. Work Authorization Program Official:

Name (typed): Douglas E. Kaempf, Program Manager Signature: *D.E. Kaempf* Date: 7/13/09

17. DOE Field Organization Official:

Name (typed): J.O. Moore Signature: *J.O. Moore* Date: 8/19/09

18. Contractor's Authorized Representative:

Name (typed): D. Christensen Signature: *D. Christensen* Date: 8/19/09

19. DOE Contracting Officer (or delegated representative)

Name (typed): M.A. Millan Signature: *Mark D. Millan* Date: 8/18/09

* The work authorization number will consist of the program code, AFP code, solicitation/project id and the fiscal year.

ATTACHMENT A – CONTRACTOR RECOVERY ACT PERFORMANCE REQUIREMENTS

Section A: Contractor Recovery Act Schedule or Milestone Requirements

Task 1 – Architected Nanomembranes for In-Situ Energy Conversion
Milestone – Complete evaluation of engineering processing concepts for architected nanocomposite membranes; August 2010

Task 2 – Nanocatalytic Conversion of Biomass into Second-Generation Biofuels
Milestone – Complete analysis of extending technology to unconventional sources of carbon-based compounds; August 2010

Task 3 – Oxide-Nanoparticle Containing Coatings for High Temperature Alloys
Milestone – Complete initial processing trials and characterization of materials with and without electromagnetic stirring; August 2010

Task 4 – Synthesis of Highly Ordered TiO₂ Nanotubes using Ionic Liquids for Photovoltaics (PV)
Milestone - Identify preferable molecular structures of ionic liquids and synthesis parameters based on characterization of nanostructures, crystalline phases and PV; May 2010

Task 5 – Nanocomposite Materials for Lithium Ion Batteries
Milestone – Develop transport models & complete characterizations; September 2012

Task 6 – Pulsed Thermal Processing of Self-Assembled Quantum Dot Structures
Milestone - Complete optical evaluation of quantum dot structures; June 2010

Task 7 – Mesoporous Carbon Membranes for Selective Gas Separations
Milestone – Develop scalable methodology for preparing supported mesoporous carbon membranes supported on anodized alumina membranes for gas separation; August 2010

Task 8 – Nanocrystallization of LiCoO₂ Cathodes for Thin Film Batteries
Milestone – Determine optima PIP parameters for achieving desired performance from Thin Film Battery cathodes; August 2010

Task 9 – Improving Heat Recovery in Biomass-Fired Boilers
Milestone – Submit draft report with results of field corrosion probe studies; June 2012

Section B: Contractor Recovery Act Performance Outcomes and Measures

All tasks described under this effort will be completed by 9-30-2012, within the budget allocated to each task. Completion of each task will be determined by the submission of a final task report to the sponsor's designated representative.

Section C: Contractor Recovery Act Deliverables

Task 1 – Architected Nanomembranes for In-Situ Energy Conversion
Deliverable, Final Report

Task 2 – Nanocatalytic Conversion of Biomass into Second-Generation Biofuels
Deliverable, Final Report

Task 3 – Oxide-Nanoparticle Containing Coatings for High Temperature Alloys
Deliverable, Final Report

Task 4 – Synthesis of Highly Ordered TiO₂ Nanotubes using Ionic Liquids for Photovoltaics (PV)
Deliverable, Final Report

Task 5 - Nanocomposite Materials for Lithium Ion Batteries
Deliverable, Final Report

Task 6 - Pulsed Thermal Processing of Self-Assembled Quantum Dot Structures
Deliverable, Final Report

Task 7 - Mesoporous Carbon Membranes for Selective Gas Separations
Deliverable, Final Report

Task 8 - Nanocrystallization of LiCoO₂ Cathodes for Thin Film Batteries
Deliverable, Final Report

Task9 – Improving Heat Recovery in Biomass-Fired Boilers
Deliverable, Final Report

ATTACHMENT 2

FINANCIAL PLAN REPORT

Financial Plan Report - Detail

OR22725 - UT-BATTELLE (RECOVERY ACT - 8909/100331)

Rpt Entity	Fund Code	Leg FT	Program	Legacy B&R	Obj. Class	Local Use	Project	WFO	Legacy Order Number	Beginning Uncosted Obs	Previous	BA Change	Revised	Total Available
470002	05794	ZT	1005098	EB5100000	25400	0473100	2004040	0000000		0.00	700,000.00	0.00	700,000.00	700,000.00
<i>AY 2009 - Work Authorization Number 470002-20476-09</i>														
Total for Program Parent/Control Point: EB5100000										0.00	700,000.00	0.00	700,000.00	700,000.00
470002	05794	ZT	1004383	ED1904032	25400	0000000	2004320	0000000		0.00	0.00	10,500,000.00	10,500,000.00	10,500,000.00
<i>AY 2009 - Work Authorization Number: IF-470002-20421-09; Appropriation Number: 8909/100331</i>														
470002	05794	ZT	1004889	ED1908000	25400	0000000	2004320	0000000		0.00	0.00	3,100,000.00	3,100,000.00	3,100,000.00
<i>AY 2009 - Work Authorization Number IF-470002-20416-09; Appropriation Number 8909/100331</i>														
Total for Program Parent/Control Point: ED0000000										0.00	0.00	13,600,000.00	13,600,000.00	13,600,000.00
Total for Fund Type: ZT										0.00	700,000.00	13,600,000.00	14,300,000.00	14,300,000.00
470002	05796	ZV	1005116	WI11001020	25400	0000000	2004350	0000000		0.00	0.00	16,800,000.00	16,800,000.00	16,800,000.00
<i>AY 2009 - Work Authorization Number: WI-470002-20458-09; Appropriation Symbol: 8909/100331</i>														
Total for Program Parent/Control Point: WI1001000										0.00	0.00	16,800,000.00	16,800,000.00	16,800,000.00
Total for Fund Type: ZV										0.00	0.00	16,800,000.00	16,800,000.00	16,800,000.00
470002	05797	ZW	1004760	WI0702000	25400	0000000	2004360	0000000		0.00	11,800,000.00	0.00	11,800,000.00	11,800,000.00
<i>AY 2009 - Work Authorization Number: WI-470002-18777-09; Appropriation Symbol: 8909/100331 - \$5.8M</i>														
<i>Work Authorization Number: WI-470002-20443-09; Appropriation Symbol: 8909/100331 - \$6.0M</i>														
Total for Program Parent/Control Point: WI0702000										0.00	11,800,000.00	0.00	11,800,000.00	11,800,000.00
Total for Fund Type: ZW										0.00	11,800,000.00	0.00	11,800,000.00	11,800,000.00
Total for Recipient Code: OR										0.00	12,500,000.00	30,400,000.00	42,900,000.00	42,900,000.00
Total for Reporting Entity: 470002										0.00	12,500,000.00	30,400,000.00	42,900,000.00	42,900,000.00
Total for OR22725 - UT-BATTELLE (RECOVERY ACT - 8909/100331)										0.00	12,500,000.00	30,400,000.00	42,900,000.00	42,900,000.00

Financial Plan Report - Detail

OR22725 - UT-BATTELLE (RECOVERY ACT - 8909/100331)

<u>Agency</u>	<u>Obligation Change Amount</u>
Total Appropriated Funds (Program 40):	0.00
Total DOE and Non-Appropriated Funds:	30,400,000.00
Grand Total:	30,400,000.00
Total Non-Appropriated Funds:	0.00
