

**EXHIBIT A  
FINAL WORK STATEMENT**

**TECHNICAL TASK LIST**

Task #	CPR	Task Name
1	N/A	Administration
2		ENERGY USE DETERMINATION
3		VARIABLE FREQUENCY DRIVE INSTALLATION
4	X	DASH HARDWARE AND SOFTWARE
5	X	ENERGY SAVINGS VERIFICATION
6		TECHNOLOGY TRANSFER ACTIVITIES
7		PRODUCTION READINESS PLAN

**KEY NAME LIST**

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	William Tschudi	Federspiel Controls	
2	William Tschudi	Federspiel Controls	Level 3, Inc.
3	William Tschudi	Federspiel Controls	Level 3, Inc.
4	William Tschudi	Federspiel Controls	Level 3, Inc.
5	William Tschudi	Federspiel Controls	Level 3, Inc.
6	William Tschudi	Federspiel Controls	Level 3, Inc.

**GLOSSARY**

*Specific terms and acronyms used throughout this scope of work are defined as follows:*

Term/ Acronym	Definition
BACnet	Building Automation and Control Network
BMS	Building Monitoring System
CPR	Critical Project Review
CRAH	Computer Room Air Handler
DASH	Datacenter Automation Software and Hardware
HVAC	Heating Ventilating and Air Conditioning
IT	Information Technology
LBL	Lawrence Berkeley National Laboratory
N/A	Not Applicable
Negawatt	Magnitude of reduced electrical energy usage from a technology
PG&E	Pacific Gas and Electric Company
PIER	Public Interest Energy Research
RD&D	Research, Development and Demonstration

Term/ Acronym	Definition
VFD	Variable Frequency Drive

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**Problem Statement:**

This project addresses a solution to a common problem with data center Heating, Ventilating and Air Conditioning (HVAC) controls and introduces a new technology – wireless temperature sensors. The problem being addressed is the oversupply and over cooling of air used to cool data centers which results in large energy waste. The technology being demonstrated allows optimization of the air flow which in turn allows higher temperature air supply. This then allows for higher temperature chilled water and the combined savings from lowering fan and chiller energy results in large savings. This technology is new and there is a tendency for data center owners to stay with proven traditional cooling methods (e.g. constant speed fans) until they see that the new technology is reliably functioning in other centers. This demonstration should provide the assurance for some operators to adopt it and then as more successful installations can be shown, it will become widely adopted.

**Goals of the Agreement:**

The overall goals for this project are two-fold. The first goal is to show that the intelligent, supervisory control and wireless mesh network sensing system demonstrated in a Public Interest Energy Research (PIER) sponsored pilot project (500-02-004 ,MRA-016) at the Franchise Tax Board’s Sacramento Data Center can scale to large scale enterprise data centers. The second goal is to demonstrate that the savings calculation produced by the control software is sufficiently accurate to support a shared savings business model that could enable rapid market adoption.

**Objectives of the Agreement:**

This project has two main objectives; they are as follows:

1. Install and commission the Datacenter Automation Software and Hardware (DASH) solution in a datacenter that is 5 times larger and has 15 times higher information technology (IT) load than the pilot project conducted at the Franchise Tax Board’s Sacramento Data Center. This objective will investigate any issues involved in scaling the wireless supervisory control to a large-scale data center.
2. Compare the automated savings estimates of DASH with detailed energy savings from independent data-logging and metering equipment. This objective will investigate any issues with, and assess the accuracy of, a “negawatt meter” approach for measurement and verification that will facilitate shared savings contracts. Shared savings contracts significantly increase the market acceptance of technology because the upfront cost and risk to the end user are greatly diminished.

**Product Guidelines:**

For complete product guidelines, refer to Section 5 in the Terms and Conditions.

1 **TASK 1 ADMINISTRATION**

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3 **Task 1.1 Attend Kick-off Meeting**

4  
5 The goal of this task is to establish the lines of communication and procedures for  
6 implementing this Agreement.

7  
8 **The Recipient shall:**

- 9
- 10 • Attend a “Kick-Off” meeting with the Commission Project Manager, the  
11 Grants Officer, and a representative of the Accounting Office. The  
12 Recipient shall bring its Project Manager, Agreement Administrator,  
13 Accounting Officer, and others designated by the Commission Project  
14 Manager to this meeting. The administrative and technical aspects of this  
15 Agreement will be discussed at the meeting. Prior to the kick-off meeting,  
16 the Commission Project Manager will provide an agenda to all potential  
17 meeting participants.

18 The administrative portion of the meeting shall include, but not be limited  
19 to, the following:

- 20 ○ Discussion of the terms and conditions of the Agreement
- 21 ○ Discussion of Critical Project Review (Task 1.2)
- 22 ○ Match fund documentation (Task 1.6)
- 23 ○ Permit documentation (Task 1.7)

24  
25 The technical portion of the meeting shall include, but not be limited to, the  
26 following:

- 27 ○ The Commission Project Manager’s expectations for accomplishing  
28 tasks described in the Scope of Work
- 29 ○ An updated Schedule of Products
- 30 ○ Discussion of Progress Reports (Task 1.4)
- 31 ○ Discussion of Technical Products (Product Guidelines located in  
32 Section 5 of the Terms and Conditions)
- 33 ○ Discussion of the Final Report (Task 1.5)

34  
35 **The Commission Project Manager shall:**

- 36 • Designate the date and location of this meeting.

37  
38 **Recipient Products:**

- 39 • Updated Schedule of Products (no draft)
- 40 • Updated List of Match Funds (no draft)
- 41 • Updated List of Permits (no draft)

42  
43 **Commission Project Manager Product:**

- 44 • Kick-Off Meeting Agenda (no draft)

1 **Task 1.2 Critical Project Review (CPR) Meetings**

2  
3 The goal of this task is to determine if the project should continue to receive Energy  
4 Commission funding to complete this Agreement and to identify any needed  
5 modifications to the tasks, products, schedule or budget.

6  
7 CPRs provide the opportunity for frank discussions between the Energy Commission  
8 and the Recipient. CPRs generally take place at key, predetermined points in the  
9 Agreement, as determined by the Commission Project Manager and as shown in the  
10 Technical Task List above. However, the Commission Project Manager may schedule  
11 additional CPRs as necessary, and any additional costs will be borne by the Recipient.

12  
13 Participants include the Commission Project Manager and the Recipient and may  
14 include the Commission Grants Officer, the Public Interest Energy Research (PIER)  
15 Program Team Lead, other Energy Commission staff and Management as well as other  
16 individuals selected by the Commission Project Manager to provide support to the  
17 Energy Commission.

18  
19 **The Commission Project Manager shall:**

- 20
- 21 • Determine the location, date, and time of each CPR meeting with the  
22 Recipient. These meetings generally take place at the Energy  
23 Commission, but they may take place at another location.
  - 24 • Send the Recipient the agenda and a list of expected participants in  
25 advance of each CPR. If applicable, the agenda shall include a  
26 discussion on both match funding and permits.
  - 27 • Conduct and make a record of each CPR meeting. One of the outcomes  
28 of this meeting will be a schedule for providing the written determination  
29 described below.
  - 30 • Determine whether to continue the project, and if continuing, whether or  
31 not modifications are needed to the tasks, schedule, products, and/or  
32 budget for the remainder of the Agreement. Modifications to the  
33 Agreement may require a formal amendment (please see the Terms and  
34 Conditions). If the Commission Project Manager concludes that  
35 satisfactory progress is not being made, this conclusion will be referred to  
36 the Energy Commission's Research, Development and Demonstration  
37 (RD&D) Policy Committee for its concurrence.
  - 38 • Provide the Recipient with a written determination in accordance with the  
39 schedule. The written response may include a requirement for the  
40 Recipient to revise one or more product(s) that were included in the CPR.

41 **The Recipient shall:**

- 42
- 43 • Prepare a CPR Report for each CPR that discusses the progress of the  
44 Agreement toward achieving its goals and objectives. This report shall  
45 include recommendations and conclusions regarding continued work of  
the projects. This report shall be submitted along with any other products

1 identified in this scope of work. The Recipient shall submit these  
2 documents to the Commission Project Manager and any other designated  
3 reviewers at least 15 working days in advance of each CPR meeting.

- 4 • Present the required information at each CPR meeting and participate in a  
5 discussion about the Agreement.

#### 6 7 **Commission Project Manager Products:**

- 8 • Agenda and a list of expected participants (no draft)
- 9 • Schedule for written determination (no draft)
- 10 • Written determination (no draft)

#### 11 12 **Recipient Product:**

- 13 • CPR Report(s) (no draft)

#### 14 15 **Task 1.3 Final Meeting**

16  
17 The goal of this task is to closeout this Agreement.

#### 18 19 **The Recipient shall:**

- 20 • Meet with Energy Commission staff to present the findings, conclusions,  
21 and recommendations. The final meeting must be completed during the  
22 closeout of this Agreement.

23  
24 This meeting will be attended by, at a minimum, the Recipient, the  
25 Commission Grants Office Officer, and the Commission Project Manager.  
26 The technical and administrative aspects of Agreement closeout will be  
27 discussed at the meeting, which may be two separate meetings at the  
28 discretion of the Commission Project Manager.

29  
30 The technical portion of the meeting shall present an assessment of the  
31 degree to which project and task goals and objectives were achieved,  
32 findings, conclusions, recommended next steps (if any) for the Agreement,  
33 and recommendations for improvements. The Commission Project  
34 Manager will determine the appropriate meeting participants.

35  
36 The administrative portion of the meeting shall be a discussion with the  
37 Commission Project Manager and the Grants Officer about the following  
38 Agreement closeout items:

- 39 ○ What to do with any equipment purchased with Energy Commission  
40 funds (Options)
- 41 ○ Energy Commission's request for specific "generated" data (not  
42 already provided in Agreement products)
- 43 ○ Need to document Recipient's disclosure of "subject inventions"  
44 developed under the Agreement
- 45 ○ "Surviving" Agreement provisions, such as repayment provisions

- and confidential Products
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement

**Products:**

- Written documentation of meeting agreements (no draft)
- Schedule for completing closeout activities (no draft)

**Task 1.4 Monthly Progress Reports**

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement on time and within budget.

The objectives of this task are to summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, and to form the basis for determining whether invoices are consistent with work performed.

**The Recipient shall:**

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the Commission Project Manager within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Exhibit A, Attachment A-2.

**Product:**

- Monthly Progress Reports (no draft)

**Task 1.5 Final Report**

The goal of the Final Report is to assess the project's success in achieving its goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further RD&D projects and improvements to the PIER project management processes.

1 The Final Report shall be a public document. If the Recipient has obtained confidential  
2 status from the Energy Commission and will be preparing a confidential version of the  
3 Final Report as well, the Recipient shall perform the following activities for both the  
4 public and confidential versions of the Final Report.  
5

6 **The Recipient shall:**

- 7 • Prepare an Outline of the Final Report.
- 8 • Prepare a Final Report following the approved outline and the latest  
9 version of the PIER Final Report guidelines published on the Energy  
10 Commission's website at  
11 <http://www.energy.ca.gov/contracts/pier/contractors/index.html> at the  
12 time the Recipient begins performing this task, unless otherwise instructed  
13 in writing by the Commission Project Manager. Instead of the timeframe  
14 listed in the Product Guidelines located in Section 5 of the Terms and  
15 Conditions, the Commission Project Manager shall provide written  
16 comments on the Draft Final Report within fifteen (15) working days of  
17 receipt. The Final Report must be completed on or before the end of the  
18 Agreement Term.
- 19 • Submit one bound copy of the Final Report with the final invoice.  
20

21 **Products:**

- 22 • Draft Outline of the Final Report
- 23 • Final Outline of the Final Report
- 24 • Draft Final Report
- 25 • Final Report  
26

27 **Task 1.6 Identify and Obtain Matching Funds**

28  
29 The goal of this task is to ensure that the match funds planned for this Agreement are  
30 obtained for and applied to this Agreement during the term of this Agreement.  
31

32 The costs to obtain and document match fund commitments are not reimbursable  
33 through this Agreement. Although the PIER budget for this task will be zero dollars, the  
34 Recipient may utilize match funds for this task. Match funds shall be spent concurrently  
35 or in advance of PIER funds for each task during the term of this Agreement. Match  
36 funds must be identified in writing and the associated commitments obtained before the  
37 Recipient can incur any costs for which the Recipient will request reimbursement.  
38

39 **The Recipient shall:**

- 40 • Prepare a letter documenting the match funding committed to this  
41 Agreement and submit it to the Commission Project Manager at least 2  
42 working days prior to the kick-off meeting. If no match funds were part of  
43 the proposal that led to the Energy Commission awarding this Agreement  
44 and none have been identified at the time this Agreement starts, then  
45 state such in the letter. If match funds were a part of the proposal that led

1 to the Energy Commission awarding this Agreement, then provide in the  
2 letter a list of the match funds that identifies the:

- 3 ○ Amount of each cash match fund, its source, including a  
4 contact name, address and telephone number and the  
5 task(s) to which the match funds will be applied
- 6 ○ Amount of each in-kind contribution, a description,  
7 documented market or book value, and its source, including  
8 a contact name, address and telephone number and the  
9 task(s) to which the match funds will be applied. If the in-  
10 kind contribution is equipment or other tangible or real  
11 property, the Recipient shall identify its owner and provide a  
12 contact name, address and telephone number, and the  
13 address where the property is located

- 14 ● Provide a copy of the letter of commitment from an authorized  
15 representative of each source of cash match funding or in-kind  
16 contributions that these funds or contributions have been secured.
- 17 ● Discuss match funds and the implications to the Agreement if they are  
18 reduced or not obtained as committed, at the kick-off meeting. If  
19 applicable, match funds will be included as a line item in the progress  
20 reports and will be a topic at CPR meetings.
- 21 ● Provide the appropriate information to the Commission Project Manager if  
22 during the course of the Agreement additional match funds are received.
- 23 ● Notify the Commission Project Manager within 10 days if during the  
24 course of the Agreement existing match funds are reduced. Reduction in  
25 match funds must be approved through a formal amendment to the  
26 Agreement and may trigger an additional CPR.

#### 27 **Products:**

- 28 ● A letter regarding match funds or stating that no match funds are provided  
29 (no draft)
- 30 ● Copy(ies) of each match fund commitment letter(s) (if applicable)  
31 (no draft)
- 32 ● Letter(s) for new match funds (if applicable) (no draft)
- 33 ● Letter that match funds were reduced (if applicable) (no draft)

#### 34 **Task 1.7 Identify and Obtain Required Permits**

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36  
37 The goal of this task is to obtain all permits required for work completed under this  
38 Agreement in advance of the date they are needed to keep the Agreement schedule on  
39 track.

40  
41 Permit costs and the expenses associated with obtaining permits are not reimbursable  
42 under this Agreement. Although the PIER budget for this task will be zero dollars, the  
43 Recipient shall budget match funds for any expected expenditures associated with  
44  
45

1 obtaining permits. Permits must be identified in writing and obtained before the  
2 Recipient can make any expenditures for which a permit is required.

3  
4 **The Recipient shall:**

- 5 • Prepare a letter documenting the permits required to conduct this  
6 Agreement and submit it to the Commission Project Manager at least 2  
7 working days prior to the kick-off meeting. If there are no permits required  
8 at the start of this Agreement, then state such in the letter. If it is known at  
9 the beginning of the Agreement that permits will be required during the  
10 course of the Agreement, provide in the letter:
  - 11 ➤ A list of the permits that identifies the:
    - 12 ▪ Type of permit
    - 13 ▪ Name, address and telephone number of the permitting  
14 jurisdictions or lead agencies
- 15 • The schedule the Recipient will follow in applying for and obtaining these  
16 permits.
- 17 • Discuss the list of permits and the schedule for obtaining them at the kick-  
18 off meeting and develop a timetable for submitting the updated list,  
19 schedule and the copies of the permits. The implications to the  
20 Agreement if the permits are not obtained in a timely fashion or are denied  
21 will also be discussed. If applicable, permits will be included as a line item  
22 in the Progress Reports and will be a topic at CPR meetings.
- 23 • If during the course of the Agreement additional permits become  
24 necessary, provide the appropriate information on each permit and an  
25 updated schedule to the Commission Project Manager.
- 26 • As permits are obtained, send a copy of each approved permit to the  
27 Commission Project Manager.
- 28 • If during the course of the Agreement permits are not obtained on time or  
29 are denied, notify the Commission Project Manager within 10 days. Either  
30 of these events may trigger an additional CPR.

31  
32 **Products:**

- 33 • Letter documenting the permits or stating that no permits are required (no  
34 draft)
- 35 • A copy of each approved permit (if applicable) (no draft)
- 36 • Updated list of permits as they change during the term of the Agreement  
37 (if applicable) (no draft)
- 38 • Updated schedule for acquiring permits as changes occur during the term  
39 of the Agreement (if applicable) (no draft)

40  
41 **TASK 2.0 ENERGY USE DETERMINATIONS**

42  
43 This task will include an engineering audit of the data center's HVAC system to include  
44 but not be limited to:

- 45 • energy data collection

- environmental data collection
- data analysis

This is to establish the energy consumption baseline for the HVAC system.

The site's local utility, Pacific Gas and Electric (PG&E), will be contacted by the Recipient on behalf of the Host site to apply for energy efficiency incentives. The fan energy consumption baseline is expected to be constant because all of the computer room air handlers (CRAH) have constant speed fans. To assess the yearly energy use of the chilled water system IT loads and HVAC system loads will be measured and the yearly energy use estimated based upon local weather conditions.

The goal of this task is to determine energy use in the baseline condition prior to making modifications to the HVAC system and its controls.

### **Task 2.1 Contact PG&E to Receive Information for “Customized Retrofit Incentive”**

The goal of this task is to begin coordination with PG&E on behalf of the host demonstration site facility for receiving an energy efficiency rebate.

#### **The Recipient shall:**

- Contact PG&E account representative for the partner host demonstration site and begin the process to receive utility financial incentives for installation of the equipment.
- Provide a signed document from a PG&E Account Representative about Customized Retrofit Incentive Application for the Datacenter Cooling Optimization monitoring incentive.

#### **Products:**

- Copy of signed document

### **Task 2.2 Measurement and Verification Plan**

The goal of this task is to develop a means to validate energy savings from the installation of the energy-efficient cooling equipment.

#### **The Recipient shall:**

- Prepare and provide a suitable measurement and verification plan to PG&E for approval, to validate energy savings. This plan is to include but not be limited to, an appropriate format for showing the duration of monitoring and the method of extrapolating the data to annualize energy use.
- Provide measurement and verification plan approved by PG&E to the Energy Commission Project Manager.

1 **Products:**

- 2       • Draft Measurement and Verification plan  
3       • Final Measurement and Verification plan  
4

5 **Task 2.3 Baseline Energy Usage Data**  
6

7 The goal of this task is to develop baseline electrical consumption for the host  
8 demonstration site facility.  
9

10 **The Recipient shall:**

- 11       • Monitor HVAC and IT electric loads correlated with indoor and outdoor  
12       environmental conditions to develop baseline electrical energy usage for the  
13       facility. Baseline data collection should follow format required by PG&E in  
14       Task 2.2.  
15

16 **Products:**

- 17       • Monitoring baseline data (no draft)  
18

19 **Task 2.4 Submit Preliminary PG&E Incentive Application**  
20

21 The goal of this task is to enable PG&E to earmark energy efficiency incentive funds for  
22 its customer (the host demonstration site) to obtain a rebate for installation of energy-  
23 efficient cooling equipment. This application is nonbinding for either the customer or  
24 PG&E.  
25

26 **The Recipient shall:**

- 27       • Submit a preliminary incentive application PG&E's Customized Retrofit  
28       Incentive program on behalf of the customer.  
29       • Provide a copy of preliminary incentive program application successfully  
30       submitted to PG&E.  
31

31 **Products:**

- 32       • Copy of preliminary incentive program application (no draft)  
33

34 **TASK 3.0 VARIABLE FREQUENCY DRIVE INSTALLATIONS**  
35

36 Energy savings for this installation will be derived from the installation of variable  
37 frequency drives (VFD) in the system supply fans.  
38

39 **Task 3.1 Procure and Install VFDs**  
40

41 This task will include procurement of VFDs and planning for sensor locations and  
42 system integration so that the system design is acceptable to the Key Partner.  
43

1 **The Recipient shall:**

- 2       • Procure and install Variable Frequency Drives  
3       • Coordinate with partner on control system details  
4       • Provide a purchase order for the VFDs  
5

6 **Products:**

- 7       • VFD Purchase Order (no draft)  
8

9 **Task 3.2 VFD System Commissioning**

10  
11 This task involves post-installation commissioning of the VFDs. The project  
12 subcontractor will have primary responsibility for this task which may involve installation  
13 subcontractors (e.g. variable frequency drives).  
14

15 **The Recipient shall:**

- 16       • Convert the constant speed fans to variable speed and plan the sensor  
17       and control system so that it is acceptable to the host site.  
18       • Prepare and provide a Commissioning plan.  
19       • Prepare and provide a control sensor location and control strategy plan.  
20

21 **Products:**

- 22       • Commissioning plan (no draft)  
23       • Control strategy plan (no draft)  
24

25 **TASK 4.0 DASH HARDWARE AND SOFTWARE**

26  
27 The Subcontractor will install DASH hardware and software and perform commissioning  
28 to verify function of the wireless control system hardware and software.  
29

30 **Task 4.1 DASH Hardware and Software Installation Planning**

31  
32 In this task, the Subcontractor will plan the DASH hardware and software installation  
33 and develop a configuration spreadsheet to document the system.  
34

35 **The Recipient shall:**

- 36       • Plan DASH hardware and software installation  
37       • Prepare and provide DASH configuration spreadsheet  
38

39 **Products:**

- 40       • DASH configuration spreadsheet (no draft)  
41

42 **Task 4.2 DASH and Building Monitoring System Integration Planning**

43  
44 In this task, planning for the integration of DASH with the Building Monitoring System  
45 (BMS) will be conducted.

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**The Recipient shall:**

- Plan the integration of DASH with the BMS.
- Prepare and provide a DASH/BMS integration design document.

**Products:**

- DASH/BMS integration design document (no draft)

**Task 4.3 Interface with PG&E for Rebate Application Technical Questions**

PG&E will make a decision to issue the energy efficiency incentive discussed under Task 2.1 based upon review of the design document that is a product of Task 4.2.

**The Recipient shall:**

- Answer questions posed by PG&E program staff regarding the design document.
- Prepare and provide a Customized Retrofit Incentive Program incentive application.

**Products:**

- Copy of approved PG&E Customized Retrofit Incentive Program incentive application (no draft)

**Task 4.4 DASH Hardware and Software Installation**

This task is the actual installation of DASH hardware and software.

**The Recipient shall:**

- Install DASH hardware and software.
- Update and provide DASH configuration spreadsheet from Task 4.1 showing integration with BMS planned in Task 4.2.

**Products:**

- Updated DASH configuration spreadsheet (no draft)

**Task 4.5 DASH Commissioning**

This task is for the commissioning of the control system installation.

**The Recipient shall:**

- Commission the DASH hardware and software installation to ensure its functionality and proper control of fan VFDs.
- Update and provide DASH configuration spreadsheet from Tasks 4.1 and 4.4.
- Prepare and provide DASH Commissioning Plan

- Participate in CPR as required in Task 1.2

**Products:**

- Update DASH configuration spreadsheet (no draft)
- DASH Commissioning Plan (no draft)

**TASK 5.0 ENERGY SAVINGS VERIFICATION**

This task is for the purpose of providing independent measurement and verification of the energy savings.

**Task 5.1 Collect Post-Retrofit Data**

The goal of this task is to quantify the magnitude of the energy savings and document measurements for inclusion in the final report.

**The Recipient shall:**

- Conduct measurement and verification activities to determine post-retrofit energy use data based on plan from Task 2.2.
- Monitoring equipment post-retrofit and provide final energy use data  
Provide BMS post-retrofit energy use data

**Products:**

- Final energy use data (no draft)
- BMS post-retrofit energy use data (no draft)

**Task 5.2 Post-Retrofit Data Analysis**

The goal of this task is to evaluate data collected in Task 5.1.

**The Recipient shall:**

- Compare measured DASH system performance against simulated performance and document significant discrepancies for investigation.
- Prepare an energy savings analysis identifying the pre- and post-project energy use and comparing measured DASH system performance with simulation results.

**Products:**

- Actual energy savings analysis. (no draft)

**Task 5.3 Submit Final PG&E Rebate Application**

The goal of this task is to finalize and submit the completed and approved final Customer Energy Efficiency Incentive application to PG&E on behalf of the customer.

1 **The Recipient shall:**

- 2 • Update and finalize the incentive application initially completed under  
3 Tasks 2.1 and 4.3.  
4 • Submit and provide copy of final PG&E Customized Retrofit Incentive  
5 program application  
6 • Participate in CPR as required in Task 1.2  
7

8 **Products:**

- 9 • Copy of final PG&E Customized Incentive program application (no draft)  
10

11 **Task 6 TECHNOLOGY TRANSFER ACTIVITIES**

12  
13 The goal of this task is to develop a plan to make the knowledge gained, experimental  
14 results and lessons learned available to key decision-makers.  
15

16 **Task 6.1 Documentation**

17  
18 The goal of this task is to prepare the necessary technology transfer documentation.  
19

20 **The Recipient shall:**

- 21 • Update and provide configuration spreadsheets to include but not be  
22 limited to:  
23 ○ DASH/BMS Integration design documents  
24 ○ System Integration Configuration Spreadsheet  
25 ○ VFD Configuration Spreadsheet .  
26 • Prepare and provide a DASH Building Automation and Control Network  
27 (BACnet) Reference Guide.  
28 • Prepare and provide DASH Operation Reference Guide.  
29 • Prepare and provide DASH Web User Reference Guide  
30

31 **Products:**

- 32 • Updated DASH Configuration Spreadsheet: Tasks 4.1, 4.4, 4.5 (no draft)  
33 • Updated DASH/BMS Integration Design Document: Task 4.2 (no draft)  
34 • Updated System Integration Configuration Spreadsheet: Task 4.4 (no  
35 draft)  
36 • VFD Configuration Spreadsheet: Task 4.5 (no draft)  
37 • DASH Building Automation and Control Network (BACnet) Reference  
38 Guide (no draft)  
39 • DASH Operation Reference Guide (no draft)  
40 • DASH Web User Reference Guide (no draft)  
41

42 **Task 6.2 User Training**

43  
44 The goal of this task is provide the framework for training of potential users of the  
45 technology.

1  
2 **The Recipient shall:**

- 3       • Identify potential user training needs and develop a system for delivering  
4       the training.  
5       • Prepare and provide training and a syllabus at the partner's site at the  
6       minimum.  
7

8 **Products:**

- 9       • DASH Training System Overview Syllabus (no draft)  
10

11 **Task 6.3 Technology Transfer Activities**

12  
13 The goal of this task is to disseminate information about this technology to the IT  
14 industry.  
15

16 **The Recipient shall:**

- 17       • Develop a PowerPoint presentations and web materials and organize and  
18       conduct a technology transfer meeting with the IT industry.  
19       • Attend an Industry meeting in Sunnyvale to present the demonstrated  
20       technology and its results.  
21       • Document pre- and post-energy use, resulting energy savings, simple  
22       payback, and life-cycle cost savings.  
23

24 **Products:**

- 25       • Copy of presentation given at Industry meeting in Sunnyvale (no draft)  
26       • Demonstration results and final report on posted on LBNL's data center  
27       website to respond to Objective #2 (no draft)  
28       • PowerPoint presentation shown at meeting with the IT Industry. (no draft)  
29       • Invitation letter (no draft)  
30       • List of attendees (no draft)  
31

32 **Task 7: PRODUCTION READINESS PLAN**

33  
34 The goal of the plan is to determine the steps that will lead to the manufacturing of the  
35 technologies developed in this project.  
36

37 **The Recipient shall:**

- 38       • Prepare a Production Readiness Plan. The degree of detail in the  
39       Production Readiness Plan discussion should be proportional to the  
40       complexity of producing or commercializing the proposed product and its  
41       state of development. The plan shall include, as appropriate, but not be  
42       limited to:  
43       ○ Identification of critical production processes, equipment, facilities,  
44       personnel resources, and support systems that will be needed to  
45       produce a commercially viable product.

- 1           ○ Internal manufacturing facilities, as well as supplier technologies,
- 2           capacity constraints imposed by the design under consideration,
- 3           identification of design critical elements and the use of hazardous or
- 4           non-recyclable materials. The product manufacturing effort may
- 5           include “proof of production processes.”
- 6           ○ A projected “should cost” for the product when in production.
- 7           ○ The expected investment threshold to launch the commercial product.
- 8           ○ An implementation plan to ramp up to full production.
- 9

10 **Products:**

- 11           • Draft Production Readiness Plan
- 12           • Final Production Readiness Plan

13