

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 10/2015)

CALIFORNIA ENERGY COMMISSION



List all key partners: (attach additional sheets as necessary)
Legal Company Name:
International Rectifier
Keysight
Mentor Graphics
Synopsys

Budget Information			
Funding Source	Funding Year of Appropriation	Budget List No.	Amount
EPIC	14-15	301.001B	\$1,996,999
			\$
			\$
			\$
			\$
			\$
R&D Program Area: EERO: Buildings		TOTAL:	\$1,996,999
Explanation for "Other" selection			
Reimbursement Contract #:		Federal Agreement #:	

Recipient's Administrator/ Officer				Recipient's Project Manager			
Name:	Vojin Zivojnovic			Name:	Vojin Zivojnovic		
Address:	2967 Michelson Dr Ste G700			Address:	2967 Michelson Dr Ste G700		
City, State, Zip:	Irvine, CA 92612-0657			City, State, Zip:	Irvine, CA 92612-0657		
Phone:	949-212-0130 /	Fax:	- -	Phone:	949-212-0130 /	Fax:	- -
E-Mail:	vojin.zivojnovic@aggios.com			E-Mail:	vojin.zivojnovic@aggios.com		

Selection Process Used	
<input checked="" type="checkbox"/> Competitive Solicitation	Solicitation #: GFO-15-310
<input type="checkbox"/> First Come First Served Solicitation	

The following items should be attached to this GRF			
1. Exhibit A, Scope of Work	<input checked="" type="checkbox"/>	Attached	
2. Exhibit B, Budget Detail	<input checked="" type="checkbox"/>	Attached	
3. CEC 105, Questionnaire for Identifying Conflicts	<input checked="" type="checkbox"/>	Attached	
4. Recipient Resolution	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached	
5. CEQA Documentation	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> Attached	

_____ Agreement Manager	_____ Date	_____ Office Manager	_____ Date	_____ Deputy Director	_____ Date
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Exhibit A Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2		Development of the Energy Proportional Design Methodology
3		Development of the Institute of Electrical and Electronics Engineers Standard for Energy Proportionality
4		Virtual Prototype – Set-top Box
5		Virtual Prototype – Television Sets
6		Virtual Prototype – Personal Computer
7		Virtual Prototype – Game Console
8	X	Methodology Impact Analysis based on Virtual Prototypes
9		Device Reference Design – Set-top Box
10		Device Reference Design – Television Sets
11		Device Reference Design – Personal Computer
12		Device Reference Design – Game Console
13		Methodology Impact Analysis based on Device Reference Designs
14		Field Test – All Devices
15		Evaluation of Project Benefits
16		Technology/Knowledge Transfer Activities
17		Production Readiness Plan

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
IEEE	Institute of Electrical and Electronics Engineers
PC	Personal Computer
STB	Set-Top Box
TAC	Technical Advisory Committee
TV	Television Set
UHA	Unified Hardware Abstraction

¹ Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

Exhibit A Scope of Work

II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement

The purpose of this Agreement is to fund the development of new technology that can bring high levels of energy efficiency typically found in mobile devices to residential and commercial plug load devices, such as set-top boxes (STB), Television Sets (TV), personal computers (PC) and game consoles.

B. Problem/ Solution Statement

Problem

Plug load devices, like STB boxes, TVs, personal computers, game consoles and similar home and office devices have a significantly higher energy consumption than typical mobile devices despite offering same audio, video and information services. Mobile devices represent a negligent portion of the home or office energy consumption. Plug load devices easily contribute to more than a third of the electricity bills and represent a significant load factor for utilities. The problem is how to bring mobile efficiency to plug load devices in the shortest possible timeframe and at the lowest costs to consumers, device manufacturers, utilities and the state.

While mobile device manufacturers seemingly possess all the necessary know-how and financial means to aggressively improve energy performance to extend battery life, manufacturers of plug load devices continually struggle to meet even the moderate energy goals for their devices. The current functional convergence between the mobile and plug load devices delivers the information and entertainment content to homes and businesses in a unified way. For example, the same TV services are delivered over tablet and TV set. This trend provides a unique opportunity to leverage the unavoidable convergence and take the benefits of advanced mobile technology to address the often-neglected problem of energy consumption of plug load devices.

Solution

The recipient and its partners will develop the design and verification methodology, industry standards, prototypes and reference designs for energy optimized hardware and software to guide the plug load device manufacturers to reach mobile energy efficiency levels in the shortest time and lowest costs and verify the achieved energy savings. The primary classes of devices are the largest plug load consumers (STB, TV, PC and game consoles). For these primary classes complete fully functional reference designs shall be developed. The secondary classes of devices will be other home and office plug loads, such as small network devices, miscellaneous plug loads (e.g. pool pumps) and white appliances (e.g. refrigerators) for which the what-if analysis and standards-based design methodology shall be developed, but not the virtual prototypes and reference designs. In both classes, the focus shall be on the new and upcoming plug load device designs that are expected to be connected to the grid within the next 2-4 years.

Exhibit A Scope of Work

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Reduce the energy consumption of plug load devices by 20-50% and verify the savings;
- Provide methodology guidelines and standards for time and cost effective deployment of energy savings design best practices to the industry;
- Monitor and verify the achieved savings and the benefits to ratepayers;
- Guide state and utility policies toward more efficient plug load devices.

Ratepayer Benefits:²

This Agreement will result in the ratepayer benefits of lower costs by lowering the energy consumption of STBs, TVs, PCs, game consoles and other home and office electronic devices. The result shall be lower home electricity bills and reduced load on the state's electrical grid to contribute to increased reliability of the electricity supply.

Technological Advancement and Breakthroughs:³

This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by reducing the current issues the plug load device manufacturers are facing when developing more energy efficient devices. The new software, hardware and power management design and verification methodology shall be tested on virtual prototypes and reference designs, and in the form of design guidelines made available to the plug load device manufacturers and their suppliers.

Agreement Objectives

The objectives of this Agreement are to:

- Conduct detailed technical analysis of the energy consumption of the primary classes of plug load devices consisting of STBs, TVs, PCs and game consoles. Analyze the energy consumption of the secondary classes of devices;
- Analyze and compare the best practices for the design of mobile devices including selection of energy efficient hardware and software components and definition and implementation of device power states and latencies;
- Analyze the applicability of mobile technology best practices to the primary and secondary classes of plug load devices;
- Work with industry partners to develop virtual prototypes to conduct detailed "what-if" energy analysis and simulate energy behavior of current and newly designed devices before the physical device implementation;

² California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission, which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See CPUC "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

³ California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory and energy goals.

Exhibit A

Scope of Work

- Work with industry partners to make modifications to existing designs and develop new device reference designs based on the mobile technology practices and the results of the conducted “what-if” analysis;
- Conduct measurements and verify the achieved energy savings on all device reference designs;
- Derive the design and test methodology for energy proportional design procedures;
- Develop the design methodology guidelines for time and cost effective deployment of energy saving best practices by the industry;
- Develop the unified hardware abstraction (UHA) and layer description format including semantics and syntax as the formalism for design of energy proportional electronic systems (plug loads and mobile);
- Align with the key industry players and Institute of Electrical and Electronics Engineers (IEEE) to establish the new format as the IEEE P2415 standard;
- Measure, verify and monitor the achieved savings and benefits to the ratepayers.

Exhibit A Scope of Work

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V)**. Products that require a draft version are indicated by marking “**(draft and final)**” after the product name in the “Products” section of the task/subtask. If “(draft and final)” does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, “**days**” means working days.

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products

- Submit all data and documents required as products in accordance with the following:

Instructions for Submitting Electronic Files and Developing Software:

○ **Electronic File Format**

- Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the Energy Commission’s software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick or CD-ROM.

The following describes the accepted formats for electronic data and documents provided to the Energy Commission as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:

Exhibit A Scope of Work

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
 - Text documents will be in MS Word file format, version 2007 or later.
 - Documents intended for public distribution will be in PDF file format.
 - The Recipient must also provide the native Microsoft file format.
 - Project management documents will be in Microsoft Project file format, version 2007 or later.
- **Software Application Development**
- Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:
- Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
 - Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
 - Visual Studio.NET (version 2008 and up). Recommend 2010.
 - C# Programming Language with Presentation (UI), Business Object and Data Layers.
 - SQL (Structured Query Language).
 - Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
 - Microsoft SQL Reporting Services. Recommend 2008 R2.
 - XML (external interfaces).

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the Energy Commission's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other Energy Commission staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

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The administrative portion of the meeting will include discussion of the following:

- Terms and conditions of the Agreement;
- Administrative products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Match fund documentation (subtask 1.7);
- Permit documentation (subtask 1.8);
- Subcontracts (subtask 1.9); and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
 - An updated Project Schedule;
 - Technical products (subtask 1.1);
 - Progress reports and invoices (subtask 1.5);
 - Final Report (subtask 1.6);
 - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
 - Any other relevant topics.
- Provide an *Updated Project Schedule*, *List of Match Funds*, and *List of Permits*, as needed to reflect any changes in the documents.

The CAM shall:

- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

Recipient Products:

- Updated Project Schedule *(if applicable)*
- Updated List of Match Funds *(if applicable)*
- Updated List of Permits *(if applicable)*

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

The goal of this subtask is to determine if the project should continue to receive Energy Commission funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the Energy Commission and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient, and may include the CAO and any other individuals selected by the CAM to provide support to the Energy Commission.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit. However, the CAM may schedule additional CPR meetings as necessary. The budget will be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the Energy Commission, but they may take

Exhibit A Scope of Work

place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:

- Prepare a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a *Schedule for Providing a Progress Determination* on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)
- Task Products (draft and/or final as specified in the task)

CAM Products:

- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- Progress Determination

Subtask 1.4 Final Meeting

The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

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The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.

- The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
- The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
 - Disposition of any state-owned equipment.
 - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
 - The Energy Commission's request for specific "generated" data (not already provided in Agreement products).
 - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
 - "Surviving" Agreement provisions such as repayment provisions and confidential products.
 - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

Products:

- Final Meeting Agreement Summary (*if applicable*)
- Schedule for Completing Agreement Closeout Activities
- All Draft and Final Written Products

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

The Recipient shall:

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
 - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the "Payment of Funds" section of the terms and conditions, including a financial report on Match Fund and in-state expenditures.

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Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. The CAM will review the Final Report, which will be due at least **two months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use the Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:

- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM. (See *Task 1.1* for requirements for draft and final products.)

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Style Manual, and Final Report Template provided by the CAM with the following considerations:
 - Ensure that the report includes the following items, in the following order:
 - Cover page
 - Credits page on the reverse side of cover with legal disclaimer
 - Acknowledgements page (optional)
 - Preface
 - Abstract, keywords, and citation page
 - Table of Contents (followed by List of Figures and List of Tables, if needed)
 - Executive summary
 - Body of the report
 - References (if applicable)
 - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
 - Bibliography (if applicable)

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- Appendices (if applicable) (Create a separate volume if very large.)
- Attachments (if applicable)
- Ensure that the document is written in the third person.
- Ensure that the Executive Summary is understandable to the lay public.
 - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
 - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
 - If it's necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
- Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
- Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
- Include a brief description of the project results in the Abstract.

- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product
- Submit the revised Final Report and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period or approves a request for additional time.
- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Products:

- Final Report (draft and final)
- Written Responses to Comments on the Draft Final Report

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of Energy Commission funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

Exhibit A Scope of Work

The Recipient shall:

- Prepare a *Match Funds Status Letter* that documents the match funds committed to this Agreement. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:

- A list of the match funds that identifies:
 - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
 - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
 - A copy of a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter (*if applicable*)
- Match Funds Reduction Notification Letter (*if applicable*)

Subtask 1.8 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

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The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
 - The schedule the Recipient will follow in applying for and obtaining the permits.

The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

- Permit Status Letter
- Updated List of Permits (*if applicable*)
- Updated Schedule for Acquiring Permits (*if applicable*)
- Copy of Each Approved Permit (*if applicable*)

Subtask 1.9 Subcontracts

The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of the executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

- Subcontracts (*draft if required by the CAM*)

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TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
 - Technical area expertise;
 - Knowledge of market applications; or
 - Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.

The TAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Public interest market transformation implementers;
- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;
- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

The Recipient shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

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Products:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

The Recipient shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

Products:

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

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IV. TECHNICAL TASKS

To achieve the project goals and objectives the project shall be organized into four teams:

- STB/TV team – responsible for conducting the energy analysis, design, implementation and verification of the three types of STB devices (Internet Protocol Television, cable, satellite) and TVs. The team shall work closely with any subcontractors and partners with expert knowledge in STB and TV design;
- Computer team – responsible for the energy analysis, design, implementation and verification of the PC and game devices. The team shall work closely with any subcontractors and partners with expert knowledge in computer design;
- Design methodology and standards team – shall aggregate the best practices from the device teams and convert them into methodology guidelines, propose the new standards and work with IEEE on its implementation and release;
- Impact team – shall assess the impact of the proposed prototyping and device design solutions, as well as monitor and verify the achieved savings and benefits to the ratepayers.

Each team shall be led by one team member from the recipient with help and participation of experts from other subcontractors and partners.

TASK 2: Development of the Energy Proportional Design Methodology

The goal of this task together with tasks 8 and 13 is to develop a methodology for electronic systems and devices ensuring proportionality of energy consumption to the amount of work performed across all operating states of the device.

The Recipient shall:

- Prepare the *Existing Methodologies Report* that compares the industry-typical methodologies in use today, including a strength, weakness, opportunities, and threats (SWOT) analysis about their suitability for taking into consideration energy efficiency and energy proportionality;
- Identify techniques for achieving energy proportionality in an electronic system and explore how those techniques could be folded into existing design methodology;
- Define a new design methodology focusing on improving the energy proportionality of the resulting systems and devices;
- Prepare the first draft of the *Methodology Specification Document* explaining the proposed methodology in summary and detail;
- Create a proof of concept showcasing how the design methodology is to be applied in a typical project and how it will achieve energy proportionality and create the *Proof of Concept System Definition*, which is a description of the system in a formal description format.

Products:

- Existing Methodologies Report
- Methodology Specification Document (draft)
- Proof of Concept System Definition

Exhibit A

Scope of Work

TASK 3: Development of the Institute of Electrical and Electronics Engineers P2415 Standard for Energy Proportionality

The purpose of this task is to take an active role in IEEE P2415 standardization of modeling systems and devices for energy proportionality.

The Recipient shall:

- Participate in IEEE P2415 standardization meetings.
- Produce an *IEEE P2415 Standardization Update Report* after each IEEE P2415 standardization meeting.
- Produce an *IEEE P2415 Standardization Final Report* summarizing the resulting IEEE P2415 standard for energy proportionality.
- Analyze the impacts of the ratified IEEE P2415 standard on the design methodology; summarize the findings in a *Methodology Impact Report*.
- Update the *Methodology Specification Document* and finalize as necessary.

Products:

- IEEE P2415 Standardization Update Reports
- IEEE P2415 Standardization Final Report
- Methodology Impact Report
- Methodology Specification Document (updated and final)

TASK 4: Virtual Prototype – Set-Top Box

The purpose of this task is to develop a virtual prototype for a STB Box, capable of simulating the power states of all relevant components and produce energy estimates for the complete device for a set of typical use cases.

The Recipient shall:

- Define the typical use cases relevant for a STB device and create a *Use Case Definition Document for STB*
- Create a *Functional Specification Document for a STB virtual prototype*.
- Create an *Architecture Specification Document for the STB virtual prototype*.
- Develop a Virtual Prototype of the complete STB system that includes, but is not limited to the following:
 - Create a functional model of the complete system using existing project partner tools
 - Create UHA models of the individual hardware components required for the virtual prototype, covering all relevant power states and transitions.
 - Integrate the models into a virtual prototype of the complete system.
 - Include the STB software into the virtual prototype.
- Prepare a *Test Plan* for testing functional correctness of the virtual prototype.
- Simulate and test the virtual prototype for all typical use cases defined, producing a *Simulation Report*, including the test results and energy profiles.
- Identify energy efficiency opportunities and optimize the model accordingly by tuning model parameters and changing or adding power management software modules.
- Create a *User Manual for the Virtual Prototype* including step by step instructions for how to simulate different usage scenarios.

Exhibit A Scope of Work

Products:

- Use Case Definition Document for STB
- Functional Specification Document for a STB Virtual Prototype
- Architecture Specification Document for the STB Virtual Prototype
- Test Plan
- Simulation Report (draft and final)
- User Manual for the Virtual Prototype

TASK 5: Virtual Prototype – Television Sets

The purpose of this task is to develop a virtual prototype for a TV, capable of simulating the power states of all relevant components and produce energy estimates for the complete device for a set of typical use cases.

The Recipient shall:

- Create a *Use Case Definition Document for TV*, which defines the typical use cases relevant for a TV device.
- Create a *Functional Specification Document for a TV Virtual Prototype*.
- Create an *Architecture Specification Document for the TV Virtual Prototype*.
- Develop a Virtual Prototype of the complete TV system that includes, but is not limited to the following:
 - Create a functional model of the complete system using existing project partner tools
 - Create UHA models of the individual hardware components required for the virtual prototype, covering all relevant power states and transitions.
 - Integrate the models into a virtual prototype of the complete system.
 - Include the TV software into the virtual prototype.
- Prepare a *Test Plan* for testing functional correctness of the virtual prototype.
- Simulate and test the virtual prototype for all typical use cases defined, producing a draft and final *Simulation Report*, including the test results and energy profiles.
- Identify energy efficiency opportunities and optimize the model accordingly by tuning model parameters and changing or adding power management software modules.
- Create a *User Manual* for the virtual prototype including step by step instructions for how to simulate different usage scenarios.

Products:

- Use Case Definition Document for TV
- Functional Specification Document for a TV Virtual Prototype
- Architecture Specification Document for the TV Virtual Prototype
- Test Plan
- Simulation Report (draft and final)
- User Manual for the virtual prototype

TASK 6: Virtual Prototype – Personal Computer

The purpose of this task is to develop a virtual prototype for a PC, capable of simulating the power states of all relevant components and produce energy estimates for the complete device for a set of typical use cases.

Exhibit A Scope of Work

The Recipient shall:

- Define the typical use cases relevant for a PC and create a *Use Case Definition Document for PC*
- Create a *Functional Specification Document for a PC virtual prototype*.
- Create an *Architecture Specification Document for the PC virtual prototype*.
- Develop a Virtual Prototype of the complete PC system that includes, but is not limited to the following:
 - Create a functional model of the complete system using existing project partner tools
 - Create UHA models of the individual hardware components required for the virtual prototype, covering all relevant power states and transitions.
 - Integrate the models into a virtual prototype of the complete system.
 - Include the PC software into the virtual prototype.
- Prepare a *Test Plan* for testing functional correctness of the virtual prototype.
- Simulate and test the virtual prototype for all typical use cases defined, producing a draft and final *Simulation Report*, including the test results and energy profiles.
- Identify energy efficiency opportunities and optimize the model accordingly by tuning model parameters and changing or adding power management software modules.
- Create a *User Manual* for the virtual prototype including step by step instructions for how to simulate different usage scenarios.

Products:

- Use Case Definition Document for PC
- Functional Specification Document for a PC Virtual Prototype
- Architecture Specification Document for the PC Virtual Prototype
- Test Plan
- Simulation Report (draft and final)
- User Manual for the Virtual Prototype

TASK 7: Virtual Prototype – Game Console

The purpose of this task is to develop a virtual prototype for a game console, capable of simulating the power states of all relevant components and produce energy estimates for the complete device for a set of typical use cases.

The Recipient shall:

- Define the typical use cases relevant for a game console and produce a *Use Case Definition Document for Game Console*.
- Create a *Functional Specification Document for a Virtual Prototype of a Game Console*.
- Create an *Architecture Specification Document for the game console Virtual Prototype*.
- Develop a Virtual Prototype of the complete game console system that includes, but is not limited to the following:
 - Create a functional model of the complete system using existing project partner tools
 - Create UHA models of the individual hardware components required for the virtual prototype, covering all relevant power states and transitions.
 - Integrate the models into a virtual prototype of the complete system.
 - Include the software for the game console into the virtual prototype, covering a standard operating system as well as application software required for the typical use cases identified.
- Prepare a *Test Plan* for testing functional correctness of the virtual prototype.

Exhibit A Scope of Work

- Simulate and test the virtual prototype for all typical use cases defined, producing a draft and final *Simulation Report*, including the test results and energy profiles.
- Identify energy efficiency opportunities and optimize the model accordingly by tuning model parameters and changing or adding power management software modules.
- Create a *User Manual for the Virtual Prototype* including step by step instructions for how to simulate different usage scenarios.

Products:

- Use Case Definition Document for game console
- Functional Specification Document for virtual prototype of a game console
- Architecture Specification Document for the game console virtual prototype
- Test Plan
- Simulation Report (draft and final)
- User Manual for the virtual prototype

TASK 8: Methodology Impact Analysis based on Virtual Prototypes

The purpose of this task is to assess whether and how the design methodology developed in task 2 should be revised based on the experience from developing the different virtual prototypes.

The Recipient shall:

- Create a *Methodology Experience Report* detailing the experience with the design methodology during the development of the virtual prototypes.
- Propose changes to the design methodology in order to address limitations or weaknesses of the methodology uncovered during the development of the virtual prototypes.
- Create an *Updated Methodology Specification Document* which shall include all changes to the design methodology based on the addressed limitations or weaknesses during the development of the virtual prototypes.
- Participate in a CPR meeting and prepare a *CPR Report* in accordance with subtask 1.3 (CPR Meetings)

Products:

- Methodology Experience Report
- Updated Methodology Specification Document
- CPR Report

TASK 9: Device Reference Design – Set-top Box

The purpose of this task is to create a reference design for a STB showcasing how the developed design methodology can be used to improve the energy efficiency of such a device compared to existing devices.

The Recipient shall:

- Analyze existing designs of STBs and identify opportunities for energy efficiency gains.
- Create a new or modify an existing *Architecture Specification Document* for a reference STB employing the design methodology developed so far.
- Assemble the system hardware and integrate the software for the reference design.

Exhibit A

Scope of Work

- Prepare a *Test Plan* for testing the functional correctness of the device.
- Test and verify the reference design for functional correctness based on the typical use cases defined in Task 4 and produce a *Functional Verification Report*.
- Develop a measurement testbed for measuring the detailed power and energy behavior of the system and its main components and create a *Measurement Testbed Specification Document*.
- Measure power and energy profiles of the device for the typical use cases and prepare a draft *Measurement Report*.
- Tune the power management software to optimize power efficiency for the typical use cases.
- Perform energy and performance measurements and prepare the final *Measurement Report*.
- Create a *User Manual for the STB* that discusses how to optimize power efficiency.

Products:

- Architecture Specification Document
- Test Plan
- Functional Verification Report
- Measurement Testbed Specification Document
- Measurement Report (draft and final)
- User Manual for the Reference Design STB

TASK 10: Device Reference Design – Television Sets

The purpose of this task is to create a reference design for a TV device showcasing how the developed design methodology can be used to improve the energy efficiency of such a device compared to existing devices.

The Recipient shall:

- Analyze existing designs of TV and identify opportunities for energy efficiency gains.
- Create a new or modify an existing *Architecture Specification Document* for a reference TV employing the design methodology developed so far.
- Assemble the system hardware and integrate the software for the reference design.
- Prepare a *Test Plan* for testing the functional correctness of the device.
- Test and verify the reference design for functional correctness based on the typical use cases defined in task 5 and produce a *Functional Verification Report*.
- Develop a measurement testbed for measuring the detailed power and energy behavior of the system and its main components and create a *Measurement Testbed Specification Document*.
- Measure power and energy profiles of the device for the typical use cases and prepare a draft *Measurement Report*.
- Tune the power management software to optimize power efficiency for the typical use cases.
- Perform energy and performance measurements, prepare the final *Measurement Report*.
- Create a *User Manual for the TV Reference Design* that discusses how to optimize power efficiency

Exhibit A Scope of Work

Products:

- Architecture Specification Document
- Test Plan
- Functional Verification Report
- Measurement Testbed Specification Document
- Measurement Report (draft and final)
- User Manual for the TV Reference Design

TASK 11: Device Reference Design – Personal Computer

The purpose of this task is to create a reference design for a PC device showcasing how the developed design methodology can be used to improve the energy efficiency of such a device compared to existing devices.

The Recipient shall:

- Analyze existing designs of PCs and identify opportunities for energy efficiency gains.
- Create a new or modify an existing *Architecture Specification Document* for a reference PC employing the design methodology developed so far.
- Assemble the system hardware and integrate the software for the reference design.
- Prepare a *Test Plan* for testing the functional correctness of the device.
- Test and verify the reference design for functional correctness based on the typical use cases defined in task 6, produce a *Functional Verification Report*.
- Develop a measurement testbed for measuring the detailed power and energy behavior of the system and its main components and create a *Measurement Testbed Specification Document*.
- Measure power and energy profiles of the device for the typical use cases and prepare a draft *Measurement Report*.
- Tune the power management software to optimize power efficiency for the typical use cases.
- Perform energy and performance measurements, prepare the final *Measurement Report*.
- Create a *User Manual for the PC Reference Design* that discusses how to optimize power efficiency.

Products:

- Architecture Specification Document
- Test Plan
- Functional Verification Report
- Measurement Testbed Specification Document
- Measurement Report (draft and final)
- User Manual for the PC Reference Design

TASK 12: Device Reference Design – Game Console

The purpose of this task is to create a reference design for a game console showcasing how the developed design methodology can be used to improve the energy efficiency of such a device compared to existing devices.

Exhibit A Scope of Work

The Recipient shall:

- Analyze existing designs of game consoles and identify opportunities for energy efficiency gains.
- Create a new or modify an existing *Architecture Specification Document* for a reference game console employing the design methodology developed so far.
- Assemble the system hardware and integrate the software for the reference design.
- Prepare a *Test Plan* for testing the functional correctness of the device.
- Test and verify the reference design for functional correctness based on the typical use cases defined in task 7, produce a *Functional Verification Report*.
- Develop a measurement testbed for measuring the detailed power and energy behavior of the system and its main components, create a *Measurement Testbed Specification Document*.
- Measure power and energy profiles of the device for the typical use cases and prepare a draft *Measurement Report*.
- Tune the power management software to optimize power efficiency for the typical use cases.
- Perform energy and performance measurements and prepare the final *Measurement Report*.
- Create a *User Manual for the Game Console Reference Design* that discusses how to optimize power efficiency.

Products:

- Architecture Specification Document
- Test Plan
- Functional Verification Report
- Measurement Testbed Specification Document
- Measurement Report (draft and final)
- User Manual for the Game Console Reference Design

TASK 13: Methodology Impact Analysis based on Device Reference Designs

The purpose of this task is to assess whether and how the design methodology developed in this project so far should be revised based on the experience from developing the reference designs for the different devices.

The Recipient shall:

- Create a *Methodology Experience Report* detailing the experience with the design methodology during the development of the reference designs.
- Propose changes to the design methodology in order to address limitations or weaknesses of the methodology uncovered during the development of the reference designs.
- Create an *Updated Methodology Specification Document* which shall include all changes to the design methodology based on the limitations or weaknesses during the development of the reference designs.

Products:

- Methodology Experience Report
- Updated Methodology Specification Document

Exhibit A Scope of Work

TASK 14: Field Test – All Device Types

The purpose of this task is to demonstrate the real-life energy efficiency gains brought about by the reference designs developed in this project by comparing the power consumption of those devices when used by a typical private user against the power consumption of traditional devices of the same type.

The Recipient shall:

- Prepare a *Test Plan* covering field testing each of the device types
- Identify 10-20 consumer households as candidates to participate in the field test of at least 2 households for each device type with CAM's participation and approval.
- Install the reference design devices in the selected households, alongside power measurement equipment to log the power consumption history for the duration of the field test.
- Collect the equipment and process the logged data for analysis.
- Prepare an *Impact Report (STB, TV, PC, and Game Console)* based on the data obtained during the field test.

Products:

- Test Plan
- Impact Report (STB, TV, PC, and Game Console)

TASK 15: Evaluation of Project Benefits

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:
 - For Product Development Projects and Project Demonstrations:
 - Published documents, including date, title, and periodical name.
 - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
 - Greenhouse gas and criteria emissions reductions.
 - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.

Exhibit A Scope of Work

- A discussion of project product downloads from websites, and publications in technical journals.
- A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Additional Information for Product Development Projects:
 - Outcome of product development efforts, such copyrights and license agreements.
 - Units sold or projected to be sold in California and outside of California.
 - Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.
 - Investment dollars/follow-on private funding as a result of Energy Commission funding.
 - Patent numbers and applications, along with dates and brief descriptions.
- Additional Information for Product Demonstrations:
 - Outcome of demonstrations and status of technology.
 - Number of similar installations.
 - Jobs created/retained as a result of the Agreement.
- For Information/Tools and Other Research Studies:
 - Outcome of project.
 - Published documents, including date, title, and periodical name.
 - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
 - The number of website downloads.
 - An estimate of how the project information has affected energy use and cost, or has resulted in other non-energy benefits.
 - An estimate of energy and non-energy benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.

The Energy Commission may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Exhibit A Scope of Work

Products:

- Kick-off Meeting Benefits Questionnaire
- Mid-term Benefits Questionnaire
- Final Meeting Benefits Questionnaire

TASK 16: Technology/Knowledge Transfer Activities

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

The Recipient shall:

- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
 - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
 - A description of the intended use(s) for and users of the project results.
 - Published documents, including date, title, and periodical name.
 - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
 - A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
 - The number of website downloads or public requests for project results.
 - Additional areas as determined by the CAM.
- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California Energy Commission.
- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Products:

- Initial Fact Sheet (draft and final)
- Final Project Fact Sheet (draft and final)
- Presentation Materials (draft and final)
- High Quality Digital Photographs
- Technology/Knowledge Transfer Plan (draft and final)
- Technology/Knowledge Transfer Report (draft and final)

Exhibit A Scope of Work

TASK 17: Production Readiness Plan

The goal of this task is to determine the steps that will lead to the manufacturing of technologies developed in this project or to the commercialization of the project's results.

The Recipient shall:

- Prepare a *Production Readiness Plan*. The degree of detail in the plan should be proportional to the complexity of producing or commercializing the proposed product, and to its state of development. As appropriate, the plan will discuss the following:
 - Critical production processes, equipment, facilities, personnel resources, and support systems needed to produce a commercially viable product.
 - Internal manufacturing facilities, supplier technologies, capacity constraints imposed by the design under consideration, design-critical elements, and the use of hazardous or non-recyclable materials. The product manufacturing effort may include "proof of production processes."
 - The estimated cost of production.
 - The expected investment threshold needed to launch the commercial product.
 - An implementation plan to ramp up to full production.
 - The outcome of product development efforts, such as copyrights and license agreements.
 - Patent numbers and applications, along with dates and brief descriptions.
 - Other areas as determined by the CAM.

Products:

- Production Readiness Plan (draft and final)

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: AGGIOS, INC.

RESOLVED, that the State Energy Resources Conservation and Development Commission (Energy Commission) adopts the staff CEQA findings contained in the Agreement or Amendment Request Form (as applicable); and

RESOLVED, that the Energy Commission approves Agreement EPC-15-021 from GFO-15-310 with AGGIOS, Inc. for a \$1,996,999 grant to develop technology that can bring high levels of energy efficiency, typically found in mobile devices, to other electronic plug load devices, such as set-top boxes, television sets, personal computers, and game consoles; and

FURTHER BE IT RESOLVED, that the Executive Director or his/her designee shall execute the same on behalf of the Energy Commission.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the California Energy Commission held on March 9, 2016.

AYE: [List of Commissioners]

NAY: [List of Commissioners]

ABSENT: [List of Commissioners]

ABSTAIN: [List of Commissioners]

Tiffani Winter,
Secretariat