

# **GFO-15-310**

Developing a Portfolio of Advanced Efficiency Solutions:  
Plug Load Technologies and Approaches for Buildings  
Phase II

October 12, 2015

## **Pre-Application Questions, Answers, and Clarifications**

**State of California**

**California Energy Commission**

<http://www.energy.ca.gov/contracts/index.html>

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## Plug Load

1. We are going to propose a high-efficiency solid-state cooling device for a residential/commercial building and associated systems integration for an effective control based on the use of Building Energy Management System (BEMS).

We have realized that there are various definitions of plug load devices depending on agencies/organizations.

- I would like to ask to confirm if your program (#15-310) considers a small A/C (e.g., a personal desktop-plug cooling module) as a type of plug load device.

For an effort for lowering building electricity use related to plug loads, we approach in two ways: by developing a high efficiency cooling device (using plug power); and by designing a smart control using a user's behaviors and climate data integrated with BEMS.

- I would like to ask whether our research focus would be appropriate for Group A or Group B in the program.

**A: The Energy Commission cannot, at this time, answer whether or not your particular project is eligible for funding, because all the project details are not known. It is the applicant's responsibility to determine whether or not their particular proposed project is eligible for funding, by reviewing the Eligibility Requirements in Section II. However, as to the first question, hypothetically, and assuming all other eligibility requirements are met, small plug-in A/C devices do fall within the scope of this solicitation. As to the second question, this research is appropriate for Group A. Keep in mind that an application must justify the technical merit and need in Attachment 4, such as amount of energy savings relative to the total energy consumed by all other plug load devices.**

**A definition for plug loads has been added in Section I.B. of the Application Manual.**

2. For the purpose of this solicitation, are the following considered plug loads? And if they are, which category of plug loads do they fall under (e.g., miscellaneous or electronic)?
  - A. Coffee makers and warmers
  - B. Vending machines, beverage coolers
  - C. Cold/hot water dispensers
  - D. Computers, servers, storage and networking devices in building's closets/server rooms?
  - E. IT equipment (servers, storage and networking devices) in data centers?
  - F. Toasters, induction cookers, microwaves
  - G. Refrigerators

**A:** For the purposes of this solicitation, the definition of plug loads is electrical devices which are brought into the building by the occupants or electrical devices which are builder or building-owner installed and which are not regulated by Title 24. (See Application Manual Section I.B, “Key Words/Terms.”) This can include white goods appliances, consumer and office electronics, and miscellaneous electric loads. As electronic and miscellaneous devices are currently 2/3’s of California’s residential electrical load, improvements in this area could provide significant benefits to California ratepayers. However, all plug load devices and technologies, such as those referenced in this question and Question 1, are eligible if applicants demonstrate significant technical merit and need, and benefits to California ratepayers, in Attachment 4.

Plug loads can be categorized as follows:

- Appliances:** These include but are not limited to white goods such as refrigerators, electric ranges, clothes washers and dryers, dishwashers.
- Electronic plug loads (E):** These are consumer electronic devices that have an internal/external AC-DC power supply and include but are not limited to TVs, set top boxes, personal computers, laptops, tablets, printers, monitors.
- Miscellaneous plug loads (MEL):** These are loads that are plugged in but are not consumer electronics, including but not limited to aquarium pumps and motors, coffee dispensers, towel warmers, garage door openers, portable electric spas, dehumidifiers.
- Hard-wired:** These are devices that are builder or owner installed and include but are not limited to ground fault interrupters, ceiling fans, security cameras, thermostats, irrigation timers.

The following table identifies the eligibility of some plug load devices and whether they are eligible for this solicitation.

| Device  | Plug Load Device Category | Eligible for GFO-15-310                |
|---|---------------------------|--|
| Coffee makers and warmers   | Miscellaneous             | Yes                                    |
| Vending machines, beverage coolers  | Miscellaneous             | Yes                                    |
| Cold/hot water dispensers   | Miscellaneous             | Yes                                    |
| Personal computers, including tablets and smart phones, set top boxes, routers, modems etc. | Electronic                | Yes                                    |
| Servers, storage and networking devices in closets or server rooms                          | Electronic                | No                                     |
| IT equipment in data centers  | Electronic                | No                                     |
| Toasters, microwaves  | Miscellaneous             | Yes                                    |
| Induction cookers   | Appliances                | Yes- see response to Questions 1 and 2 |
| Refrigerators   | Appliances                | Yes-See response to Questions          |

|  |  |         |
|--|--|---------|
|  |  | 1 and 2 |
|--|--|---------|

3. Can you provide examples of EPIC or PIER funds awarded to a project demonstrating software-driven behavioral changes to reduce energy use?

**A: The following are two examples of projects previously funded by the Energy Commission. Please keep in mind that eligibility for past funding is different from eligibility for this solicitation, which has its own distinct focus, eligibility requirements, and scoring criteria.**

- A Survey of Computer Power Modes Usage in a University Population- Final Project Report

**<http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2014-093>**

- Monitoring Computer Power Modes Usage in a University Population

**<http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2014-092>**

4. Does the Commission have any data on types of plug loads that meet your target definition?

**A: Yes. Here are some example reports on plug loads:**

- Office Plug Load Field Monitoring Report

**<http://energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2011-010>**

- Efficient Electronics through Measurement and Communication

**<http://www.energy.ca.gov/2015publications/CEC-500-2015-038/index.html>**

- Improved Audio-Video Efficiency Through Inter-Device Power Control: National Lab Buildings Energy Efficiency Research Projects

**<http://energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2014-099>**

- HOW LOW CAN YOU GO? A White Paper on Cutting Edge Efficiency in Commercial Desktop Computers - Final Project Report

**<http://energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2012-065>**

- Research Findings on Consumer and Office Electronics

**<http://energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2011-028>**

5. In addition to listing the devices that give us some market expansion, we might have a really terrible device but only sell one. Would this be considered a pre-commercial technology?

**A: Pre-commercial technologies are defined in the application manual as a technology that has not reached commercial maturity or been deployed at scales sufficiently large and in conditions sufficiently reflective of anticipated actual operating environments to enable the appraisal of operational and performance characteristics, or of financial risks. A technology that does not sell and has not reached commercial maturity could meet the definition of pre-**

**commercial technologies. However, you will need to indicate that this technology has technical merit and need in Attachment 4 and that it would be ready for market expansion and widespread deployment.**

6. Are there any preferences for commercial building technologies over residential?

**A: No. We are open to both commercial and residential plug load technologies.**

7. Do you consider portable space heater as a plug load device?

**A: Yes, portable space heaters are plug-in devices. However you must show that the technology has technical merit and need in Attachment 4. Please also see response to question 2.**

8. Are 220 volt plug-in appliances such as dryers, and 220V water heaters considered plug loads?

**A: Dryers are appliances and would be eligible. Water heaters that are part of the building and supply hot water to that building are not eligible. Please see answer to Question 2. However, an applicant would need to justify technical merit and need in Attachment 4, including significant energy savings and high enough equipment replacement rates to justify the energy savings, along with the impact any federal requirements would have on widespread adoption in California.**

9. Are standalone smart strips or plugs with built-in electric meters considered plug loads?

**A: Yes, but these technologies are commercially available. Only pre-commercial technologies as defined in the Application Manual, Section I.B, "Key Words/Terms," are eligible for this solicitation.**

10. Can you give us examples of plug loads? Are battery storage and EVs considered plug loads?

**A: Please see response to question 2 for some examples of plug loads. For this solicitation, battery storage and electric vehicles are not considered plug loads.**

## **Definitions**

11. In the solicitation, "plug load" is defined as anything that draws power from an outlet. This would bring in a large number of devices, including many major appliances, some HVAC equipment, some water heating devices, task lighting, and even vehicles. Is such a broad scope intended? Are there some types of plug load devices that are of more interest, or less interest, to be focuses of research under this solicitation?

**A: It is incorrect that “plug load” is defined, for the purposes of this solicitation, as anything that draws power from an outlet. Plug load is defined in Section I.B of the Application Manual, “Key Words/Terms,” as electrical devices which are brought into the building by the occupants or electrical devices which are builder or building-owner installed and which are not regulated by Title 24. Please see the response to question 2. For the purpose of this solicitation, we are emphasizing electronic and miscellaneous devices because they are currently 2/3’s of California’s residential electrical load. In addition, we will also consider hard-wired appliances that are builder-installed and not regulated by Title 24. Electric vehicles, for example, are not intended to be included in this solicitation. See the response to question 10. In all cases, applicants must justify the need for the technology in the technical merit and need section (Attachment 4 of the solicitation manual).**

12. Is there any limit on researching “covered products” covered by state or federal regulations, such as some major appliances?

**A: No. The focus of the proposal must be associated with technological improvements and advancements. Research on covered products can be included in an application to establish baseline conditions but this cannot be the sole purpose of your proposals. Please also see response to question 8 regarding federal preemption requirements.**

13. Could CEC give some input in terms of the proportion of commercial vs. pre-commercial stage smart monitoring (residential) products to be tested?

**A: All technology funded by this solicitation must be pre-commercial; however, it may contain commercially available components. It must advance science and technology and deliver energy savings. A technology used widely outside of California could also qualify as a pre-commercial technology in California if the applicant can demonstrate significant ratepayer benefits and meet any regulatory issues for installation in California.**

14. The solicitation states “Applied research and development activities include early, pilot-scale testing activities that are necessary to demonstrate the feasibility of pre-commercial technologies.” Do pilot-scale testing activities include lab testing or just field testing? For field testing, how many sites are required (e.g., just one site or multiple sites)?

**A: Pilot-scale testing can include both lab and field testing. For field testing, one site is sufficient.**

15. In Attachment 13, a suggested project under Strategy is “Research the most cost effective ways of determining duty cycling for plug load devices and appliances while using smart metering.” What does “smart metering” refer to in this example, advanced metering involving revenue-quality meters?

**A: A smart meter can determine when the equipment is on or off or in different modes of operation (e.g., hibernate, sleep, on, or, off) so that energy use of particular plug load devices can be accurately determined.**

16. Does "pre-commercial" include software products that have been used in pilot projects but have failed to be included in a statewide energy efficiency program due to structural impediments?

**A: Yes, pre-commercial technologies include software products that have been developed but have failed to launch. However, Attachment 4, Technical Merit and Need, must address how the structural impediments have been overcome and will lead to technological advancements that are feasible and achievable. Please see Application Manual Section II.B, "Key Words/Terms."**

17. Can "pre-commercial" include enhancements to an existing software tool so it can address plug load reductions more effectively?

**A: Yes, but enhancements must be associated with a plug-in technology (not a standalone software tool) and applicants must demonstrate in Attachment 4 significant technical merit and need and benefits to California ratepayers.**

18. Definition of Plug Loads: Are hard-wired home security systems and smoke detectors considered as plug loads?

**A: Yes. See also response to question 2.**

19. What is considered technology for the purpose of this GFO? Does actual hardware testing need to be included in this proposal? Are the development of software, benchmark testing standards, energy reporting protocols also considered in this GFO?

**A: For this solicitation, software development and hardware testing can be included in the proposal. Benchmark testing standards and energy reporting protocols can be included but must show significant energy savings.**

20. Please explain power scaling?

**A: Power scaling is a method of controlling electricity consumption in a device relative to the amount of work or computing power needed. For instance, when an individual is reading emails or doing searches, very little compute power is needed, compared to when the computer is tasked to run multiple, complicated calculations and databases.**

21. I have the following questions:

- a) Could you clarify the concept of hardware testing?
- b) Do you need to perform a functionality test of a technology or devices developed during this grant funding or projects focused on hardware testing?

**A:**

- a) Hardware testing is physical testing of the developed technology (not a paper study).**
- b) Yes, recipients will need to perform functionality testing of the device or technology.**

22. Plug loads are defined as anything that draws power from an outlet which brings a large number of devices including major devices such as water heating devices, lighting and HVAC, is this broad scope intended?

**A: It is incorrect that “plug load” is defined, for the purposes of this solicitation, as anything that draws power from an outlet. Plug load is defined in Section I.B of the Application Manual, “Key Words/Terms,” as electrical devices which are brought into the building by the occupants or electrical devices which are builder or building-owner installed and which are not regulated by Title 24. Please see the response to questions 2 and 11. For the purposes of this solicitation, systems that part of a building, such as built-in water heating; lighting; and HVAC units, are not considered plug load devices. Please also see response to questions 2 and 8.**

23. Can the definition of energy efficiency be interpreted to be broader like integrated demand side management or efficiency in terms of covering reduction through strategies to maximize renewable generation?

**A: Demand side management can be included in applications, such as demand response controls, but not renewable generation or battery storage (see response to question 50).**

## **Solicitation**

24. The Key Activity Schedule suggests a timeline of close to 4 years. How would CEC view a shorter, say a 2-year proposal?

**A: A two year proposal is perfectly acceptable. Projects must be completed by March 31, 2020.**

25. Will the application be rejected if a manufacturer is unwilling to reveal proprietary software coding or algorithms on how its product controls plug load devices to save energy as described in section III.D.3 of the solicitation document that discusses confidentiality?

**A: Applications must not contain any confidential information. Applications that identify any portion as confidential will be rejected pursuant to the Screening Criteria. Rather than providing proprietary coding and algorithms, you can provide publicly-disclosable information on the basis for how the product saves energy. If an applicant is successful, an applicant may potentially identify confidential information and intellectual property if such information is part of the deliverables in the resultant agreement. However, the Energy Commission will ultimately determine if it is able to keep information confidential, and applicants are discouraged from creating applications which may result in a contract which includes deliverables which are in any part confidential. See EPIC Standard Terms & Conditions, Section 23.**

26. I have the following questions:

- a) Can EPIC funds be used for out of country travel?
- b) Can EPIC funds be used to fund the testing facilities located outside of the United States?
- c) If not, can these costs be included as match funding?

**A:**

- a) EPIC funds cannot be spent on out of country travel.**
- b) EPIC funds cannot be spent on work outside the United States of America.**
- c) Yes.**

**Section III.C.7 (Budget Forms) of the application manual has been corrected to reflect this change.**

27. What Terms and Conditions will govern agreements made as a result of the solicitation? The terms and conditions covering the projects to be funded under the solicitation are referenced by a hyperlink in Part C of the Introduction: <http://www.energy.ca.gov/research/contractors.html>. This hyperlink resolves to a page on the Commission's website which a further hyperlink has entitled "EPIC Terms and Conditions". Following this link leads to further links which eventually resolve to two documents one entitled: EXHIBIT D ELECTRIC PROGRAM INVESTMENT CHARGE (EPIC) SPECIAL CONTRACT TERMS AND CONDITIONS and the other entitled: EXHIBIT C EPIC UC TERMS AND CONDITIONS. These documents have some conflicting terms. Which of these documents will cover agreements made as a result of this solicitation? If the answer is both, which has priority where the terms conflict?

**A: As indicated in Section II.A.2., there are three potentially applicable terms and conditions. If you start at <http://www.energy.ca.gov/research/contractors.html>, "Information for Research Contractors," select "EPIC Terms and Conditions" under "EPIC Contractor Resources." This takes you to <http://www.energy.ca.gov/contracts/pier.html#epicterms>, "Current Solicitations for the Energy Research and Development Division," page. On this page go to the "EPIC Terms and Conditions" and under Grant, select the terms and conditions that are applicable to your organization. For instance,**

- University of California terms and conditions: applies to applicants who are part of the University of California, such as UC Los Angeles.**
- U.S. Department of Energy terms and conditions: applies to applicants who are part of the U.S. Department of Energy, such as a national laboratory.**
- Standard terms and conditions: applies to applicants who are not the University of California nor the U.S. Department of Energy, such as private companies, non-profits, and other governmental agencies.**

28. Can the grant funds be used for outreach and marketing to recruit users for the developed technology?

**A: Yes. Keep in mind that the Energy Commission will only reimburse costs incurred after agreement execution.**

29. Can you provide any guidance on cost/benefit goals? For example: reduction of kWh/\$; or therm/\$; or lbs CO2/\$.

**A: According to Title 20 and Title 24, a technology must be considered cost-effective. In our view, the benefit to cost ratio must be at least one.**

30. In Appendix 12, sheet "Emissions Factors", 1 metric ton is defined as 2,240 pounds. Is this a typo? Several sources indicate the accurate value is 2,204.6 lbs per metric ton.

**A: Yes, that is a typo. It should be approximately 2,205 lbs per metric ton. We have corrected this in the addendum.**

31. Can one company be involved in several proposals?

**A: Yes, one entity may submit multiple applications as long as each application is distinctly different and there is no overlap between applications. A company may also be a major or minor subcontractor on other entities' applications for different projects.**

32. Does patented technology qualify for match funding?

**A: Match funds must be spent during the term of the agreement. If the patent work is started after the execution of the grant and it is related to supporting the pre-commercial technology then it may be considered match funding.**

33. Can a group of two people submit a single application as individuals?

**A: Awards will be made to one individual or entity. Individuals may apply, but there will be one awardee only. It would be up to the individuals to decide if, for example, one individual would be a subcontractor. Applicants should also keep in mind the requirement (in Section II.A.3) that entities conducting business in California must be registered with the Secretary of State. If a project proposes work which involves instate business, the individual applicant may wish to consult with her legal counsel (consider, for example, registering as a limited partnership, or creating a sole proprietorship).**

34. Does IP qualify for match funding?

**A: Match funds must be spent during the term of the agreement. If the IP work is started after the execution of the grant agreement and is part of the project and related to supporting the pre-commercial technology that is being funded by the grant, then it may be funded by match. See also response to question 32.**

## Project Scope

35. I have the following questions:

- a) Are projects that focus on propane (an under-attended form of energy in CA and elsewhere) considered under this solicitation?
- b) Is this fuel off limits due to the fact that IOUs do not provide it?

**A:**

- a) No. Projects that focus on propane are ineligible.**
- b) The funding for this solicitation comes from electric ratepayers of Pacific Gas and Electric, San Diego Gas and Electric and Southern California Edison. Projects funded under EPIC must benefit these ratepayers.**

36. Per the Grant Funding Opportunity GFO-15-310 - Developing a Portfolio of Advanced Efficiency Solutions: Plug Load Technologies and Approaches for Buildings (Phase II), how important are common communication standards to the goals sought from the subject solicitation?

**A: Common communication standards (e.g., open source) are valid technologies to include in a project application under this solicitation.**

37. I have the following questions:

- a) Under Group B, can a proposal to integrate plug loads in a residential setting be combined with integration of plug loads in a commercial building setting, if separate pilot test sites are involved for residential vs. commercial testing?
- b) Would we need to submit two proposals (i.e., one for residential and one for commercial building plug load integration)?

**A:**

- a) Yes.**
- b) No. You can submit one proposal if the tasks are written to clearly separate the two types of work. But note that if you wish to apply for two awards, there must be two separate applications for non-overlapping projects.**

38. Would plug loads themselves (devices and components such as phones, tablets, laptops etc.) be the only ones inside the scope of the grant, or could a focus on the adapters/chargers/power supplies used to charge these devices (phones, tablets, laptops, game consoles, etc.) be considered in category 1) of Group A (or any of the other categories or Group B)?

It is not obvious whether power supply technologies, such as for phone chargers and laptop adapters, that would facilitate an efficiency increase in adapters and chargers would be considered in the scope of the grant. Specifically whether energy efficiency improvements to these adapters/chargers would potentially be enough to warrant consideration for the grant and/or any guideline(s) there might be for chargers/adapters regarding what energy efficiency targets could be set as target for such pre-commercial technologies to be considered.

We may be able to get to significant power consumption reduction in the adapter/charger with pre-commercial technologies. The question comes down to whether (in the context of overall plug load system power consumption) the adapters/chargers broadly available today could be considered “highly inefficient” or otherwise be considered under the scope of the grant.

**A: Plug load devices, such as those listed in this question and applications to increase the efficiency of adapters, chargers and power supplies are eligible under this solicitation. However, many advances in energy efficiency have occurred with these devices, you must justify the technical merit, need and benefits to California ratepayers in Attachment 4. As an example, for information on current efficiencies for power supplies please go to the Plug Load Solutions 80 PLUS website: <http://www.plugloadsolutions.com/80pluspowersupplies.aspx>**

39. In the opinion of the CEC/EPIC, could today’s adapters/chargers (for phones, tablets, laptops etc.) be considered “highly inefficient” (or at least inefficient enough to be considered as a target for the GFO)?

Efficiency improvements are likewise open to interpretation – depending on the view-point.

**A: If these devices meet or exceed the efficiencies stated in the Plug Load Solutions 80 PLUS website, then they could be considered highly efficient. However, the focus of this GFO is on technologies or strategies that emphasize pre-commercial plug load technologies and improvements to processes and operations that have the potential for reducing electrical use and load in new and existing buildings and meet the requirements of Group A or Group B (see Section I.A of the application manual and Attachment 13, and response to question 38 and 41).**

40. Is the target efficiency improvement (at least 20%) indicated in Attachment 13 for Group A pertaining to
- A. The component/device (in this case the charger/adapter), or
  - B. The plug load system (in one example this could be adapter + laptop), or
  - C. The building (entire residence)?

Example (example given does not necessarily reflect present efficiency/power consumption numbers or achievable ones):

**Option A) Component/device efficiency:**

In one aspect the present average energy efficiency by converters is on the order of 85%. This means ~118W taken from the socket to power a plug load that consumes 100W. The adapter will consume ~18W. We might be able to raise the efficiency by some percentage points – e.g. 3% from 85% to 88%. In that case the power drawn from the socket would be 114W instead and the power consumed by the adapter would be ~14W. The power consumed in the adapter would thus be reduced by ~22% (which is on the order of the savings you are looking for). 22% improvement of the power consumed by component/device

**Option B) Plug load system efficiency:**

However – the power savings of the plug load system (adapter + load) would be ~4W out of ~118W, so power consumption reduction corresponding to efficiency improvement (3% in the example given). 3% improvement of the power consumed by plug load system (e.g. adapter + laptop)

**Option C) Building efficiency:**

In the attachment 12 excel sheet, the power from “Miscellaneous” is 16k7 of 58k3 total GWh for residential building power consumption today.

Since this category (“Miscellaneous”) is a rather broad “catch-all”, I will assume ~50% of that could be addressable by charger/adapter technologies (phones, tablets, laptops, ultrabooks, game consoles, GoPro cameras etc.).

The power addressable by such pre-commercial efficiency improvement technologies would then be on the order of 1.25GWh (assuming 85% adapter/charger efficiency today). In the example of reducing the power consumption of the chargers/adapters by 22%, the overall impact on power consumption in residential building would then be on the order of 0.4% (~0k25 GWh out of 58k3 GWh). 0.4% improvement of the power consumed by the (single family) residence/building

I am looking forward to your advice whether such pre-commercial technologies specifically targeting energy efficiency in chargers/adapters would be considered in the scope of the GFO.

**A: For the purpose of this solicitation, the target efficiency improvements indicated in Attachment 13 pertain to the component/device, Option A. Please refer to Section I.A. of the solicitation manual, and Attachment 13 regarding requirements for Group A or B projects..**

41. Here are my follow-up questions to Question 40:

- a. If chargers/adapters could indeed be considered, then could you advise a reasonable target power consumption reduction (energy efficiency improvement) in said devices?
- b. Is 20% reduction in power consumption of the charger/adapter (such as exemplified above) enough to be interesting (i.e. be considered in the scope of the solicitation GFO-15-310)?

**A:**

- a) **In the 80 PLUS program (see question 38), for example, there are already power supplies that are over 90% efficient. As an example devices listed on the Ecova Plug Load Solutions 80 PLUS website <http://www.plugloadsolutions.com/80pluspowersupplies.aspx> .Applicants must justify the technical merit and need in Attachment 4.**
- b) **You must make the case for the technical merit and need of your project along with benefits to California ratepayers in Attachment 4. As indicated in the response to question 38, chargers and adapters are eligible for this solicitation. However, we believe that these devices are already very efficient.**

42. Residential and commercial automation systems frequently employ multiple systems for remote monitoring (e.g., servers, hubs, back-end cloud service). Technology that operates such systems without servers, hubs or gateways could save additional energy by eliminating the backend service. Would that technology fit in Group B1 of the GFO or better fit in another category?

**A: No, this technology does not fit within the scope of this solicitation.**

43. If the proposed project is going to develop hardware and software, who will own the intellectual property of the hardware and software after the project is completed? The proposer or CEC?

**A: Typically, the Recipient owns all intellectual property developed under agreements resulting from this solicitation. Please refer to section 5(c) of the EPIC Standard Grant Terms and Conditions.**

44. Is hardware testing a requirement for this GFO?

**A: No, it is not required. If hardware is developed, then functionality testing is required. See also response to question 21.**

45. Where does the system integration in existing commercial components fit in to your pre-commercial spectrum of definition?

**A: If the resulting integration technology is pre-commercial and delivers solid energy savings, then it can use commercially-available components and may be eligible for this solicitation. Please also see response to question 13.**

46. Would counting plug loads such as computers and estimating their power consumption be an appropriate topic?

**A: Yes, counting plug loads, such as computers, and estimating their power consumption is acceptable if the study is solely focused on California and does not duplicate studies already in the public domain. Applicants must demonstrate significant technical merit and need, and benefits to California ratepayers, in Attachment 4.**

47. Would efficiency improvements of the converters for loads (not the load themselves) be considered?

**A: Yes, efficiency improvements of converters for plug loads may be considered.**

48. Are Variable Speed Drives interfaces and automated voltage controls, etc. within the scope of this solicitation?

**A: Variable speed drives and automated voltage controls would be acceptable technology under this solicitation if they directly relate to appliances or miscellaneous plug loads (see response to question 2), are otherwise eligible under the solicitation requirements, and are not associated with building-installed HVAC systems.**

49. Do you prefer plug load controls for reducing wasted energy consumption?

**A: This solicitation does not have a preference, but plug load controls for reducing wasted energy consumption are eligible.**

50. Are you looking for only energy efficiency or is demand response also considered?

**A: This solicitation's major focus is on energy efficiency. Demand response may be a secondary benefit.**

51. What about technology to eliminate back end energy consumption for any clock computing thermoses. For example, smart plug now requires a back end support to enable functionality of a remote control from your cell phone to eliminate energy consumption on the back end. Does this qualify as energy savings?

**A: Any energy-use that occurs off-site is not considered as energy savings for the purposes of this solicitation. The Energy Commission prefers energy savings that occur at the residential or commercial building level.**

52. Regarding integrated controls strategies, do you accept passive control strategies to integrate with space cooling such as natural ventilation?

**A: No, this is not the focus of the solicitation.**

53. To what extent are California's goals for ZNE buildings a driver for this solicitation, and the technologies that are developed under it?

**A: Plug loads are the fastest growing load in California. Reducing plug-in load energy consumption will be very important to achieving ZNE.**