

EPIC Investment Plan Workshop Questions
September 27, 2012

1) Program Scope

a. Are there proposed initiatives in the staff draft Investment Plan that should be dropped from the plan? Indicate the initiative(s) and explain why.

- **No Comment**

b. Are critical initiatives missing that are consistent with the EPIC mission? If so, please describe the initiative using the template in the Investment Plan (and outlined below).

- **Geothermal heat pump systems are missing entirely from this Plan, except for the single mention in retrofiting. Considering the recent signing of AB2339, initiatives related to this legislation should be added to the investment plan. A longer narrative occurs later in this submission.**

c. Are there proposed initiatives that are too narrow in scope? By contrast, are there proposed initiatives that are too broad in scope? Please indicate which initiative(s) and explain.

- **N/A**

d. Do the initiatives identified in the investment plan put the right emphasis on technologies that would significantly benefit from new innovations (e.g., in the applied research category) versus those that would significantly benefit from scale-up (e.g., in the technology demonstration & deployment category)? Please explain.

- **No. Solar and Biomass are heavily favored, while geothermal power is under-represented considering the resources available in California and the flexible and firming nature of the resource. Reducing upfront risk of geothermal should be as large if not larger than solar and storage initiatives in the EPIC plan as the very nature of geothermal energy can answer the challenges of integrating renewable energy in a way that is more amenable to system operators than variable resources such as solar and wind. Furthermore, this point is emphasized by the fact that levelized cost for geothermal energy is among the lowest for all power producing technologies, based on California Energy Commission studies. As a long term investment, therefore, geothermal energy has significant advantages that are not considered in this plan.**

2) Funding Priorities

a. Where should the greatest amount of funding be allocated among the initiatives to maximize the deployment of clean energy technologies?

- **Reducing project development risk of renewable energy and firming capabilities.**

3) Project Match Funding

a. Are the minimum match funding requirements appropriate for applied R&D and

technology demonstration & deployment categories? What level of match funding from local government is appropriate for the proposed market facilitation grant award?

- **There are some areas in California that have vast potential for renewable energy but are financially stressed. For example, the geothermal resources in Modoc and Mono Counties are under-developed and are located in local jurisdictions that are going through or are near bankruptcy. Requiring a match for these governments may mean missing out on some of the best resources California has to offer while removing an opportunity for economic development that could *help* these local economies. Similar arguments can be made for many counties, each with its own set of financial challenges. Match funding is appropriate, but it should be scaled according to local conditions, and should be flexible in terms of “in-kind” match share.**

4) Funding Priorities

a. What is the minimum and maximum amount of EPIC funds that should be set aside as match funding for federal awards? Please explain.

- **No more than 10% and it should be allowable for those funds to be reallocated to other EPIC initiatives at the end of the triennial cycle if the funds are not used.**

5) Intellectual Property

a. Are the IP rights in the Plan an appropriate balance to encourage innovation while returning applicable benefits to the ratepayers?

- **No comment**

6) Advisory Structure

a. Should there be an advisory structure, and if so, what elements are most important?

- **Yes. It should be composed of a broad-based suite of expertise that is aware of the complex resource distribution throughout California, and should have a majority representation that is independent of IOUs. The advisory capacity should be fulfilled by balanced representation from each renewable technology, and should have as its goal a stable energy infrastructure that is also flexible and able to smartly accommodate emerging technologies. Individuals should be selected who have a history of non-partisan expert participation in energy policy and technology development issues.**

b. What coordination with the IOUs proposed Investment Plans will be most helpful to you?

- **IOUs have a fundamental requirement to maintain short-term return on investment as a principle criterion for decision making processes. This can limit risk taking, reduce long-term vision, eschew innovation, and slow the rate of development of any technology or strategy that would reduce income. Therefore, coordination with IOU proposed Investment Plans will only be helpful to the extent that it simplifies introduction of expanded renewable technologies, improves access to transmission, reduces installation costs for generation capacity and expands distributed generation and community choice aggregation opportunities.**

7) Other Comments

Please articulate additional comments that would strengthen the Energy Commission’s proposed EPIC Investment Plan.

- The California Geothermal Energy Collaborative (CGEC) at UC Davis is in strong support of the Energy Commissions proposed funding initiative #S4.3 Develop Advanced Technologies and Strategies to Improve the Cost-Effectiveness of Geothermal Energy Production. The CGEC in conjunction with University of Nevada, Reno are working with the National Science Foundation (NSF) and the geothermal industry to start a Center for Geothermal Resources. This Center, if approved by NSF will focus specifically on this type of research. UC Davis and UNR would welcome the chance to work with the Energy Commission on studies related to this initiative while leveraging funding from federal agencies, the universities, and industry.**

California Energy Commission Staff Draft EPIC Initiative Template
Proposed Funding Initiative: Geothermal Heat Pump Barrier & Implementation Study

Technology Pipeline Stage				Electricity System Value Chain			
Applied R&D and Pilot-scale Testing	Fullscale Demo	Early Deployment	Market Facilitation	Grid Operations/ Market Design	Generation	Transmission/ Distribution	Demand – side Management
X	X	X	X	X		X	X

Issues:

- Geothermal Heat Pumps have been identified by the EIA as one of the most efficient market-ready technologies. While penetration of this technology has grown in other states, California remains far behind in GHP integration. AB2339 (2012), signed on September 27, 2012, requires the CEC in consultation with the CPUC to evaluate and recommend policies and implementation strategies to overcome barriers to the deployment and use of GHP technologies. By creating an initiative in the EPIC investment plan to address this legislation, the CEC will be leveraging existing programs to complete the work on this bill that does not have an appropriation.**

Purpose:

- **By reviewing the GHP market in California, incentives, rebate programs, efficiencies by region, etc. the Energy Commission will be complying with this recently passed legislation while promoting one of the most efficient heating and cooling technologies on the market.**

How will this technology or strategy help address the issue(s)?

GHP systems when modeled conservatively can achieve a 44% average energy savings on heating and cooling across California, with some areas achieving a reduction of over 70%.

Which objective of the draft investment plan does this initiative address?

- **Market Facilitation**

Please include a summary of relevant stakeholder support for the strategy or technology (if any). Also, describe how this technology or strategy will provide ratepayer benefits as described in the CPUC EPIC Phase 2 Decision.]

- **The direct rate-payer benefits include greater grid-reliability, drastically lower electric and natural gas bills, comfort during peak summer hours by not relying as heavily on the grid for air-conditioning, etc. Indirect benefits include less GHGs, particularly NO_x, reduction in IOU portfolio risk leading to more stable rates over time and local economic development. In addition, reducing electrical demand will also benefit the state by reducing the absolute RPS target.**

Background:

[Provide a few paragraphs discussing the context for this initiative. What has been done or is currently being done on this technology or strategy? Where in the innovation pipeline is the technology or strategy?]

- **GHPs are a relatively mature technology outside of California, though little exists in terms of industry infrastructure within the state which is why we suggest that this initiative be categorized in the “Market Facilitation” section of the Investment Plan.**
- **The CGEC recently completed a study for the CEC under the PIER program that examined the efficiency of these systems in the 16 California climate zones. Our findings show that these systems are more efficient in 15 of the 16 climate zones and in the outlying climate zone they are just as efficient as a traditional HVAC system.**
- **The CEC has a huge opportunity to work on wide-spread deployment of this technology as they have for solar PV. GHP systems coupled with PV systems can nearly take a residence off-grid, thus reducing the need for more transmission lines, and retrofits to distribution lines, while also supporting the AB32 and RPS mandates.**

• Market Facilitation: program tracking, market research, education and outreach, regulatory assistance and streamlining, and workforce development to support clean energy technology and strategy deployment (regulatory assistance, workforce development, education and outreach, program tracking, market research)

- **In a recent report, the California Geothermal Energy Collaborative examined the**

- efficiency of GHP systems in all 16 California climate zones. The findings show that replacing HVAC systems by GHP systems would save the average residence 44% of its electrical consumption for HVAC purposes. These systems have been installed in hospitals, schools and other public facilities in a few locations in the state and have been shown to be exceptionally effective. However, the absence of a state-recognized program for qualifying designers and installers has also lead to inappropriate applications, designs and installations. It would be extremely advantageous for the state to aggressively pursue a standardized approach for these systems, much as it does for installation of other facilities that require electrical power.**
- **It should also be noted that the Department of Energy is finalizing a report that documents national benefits for deployment of GHP systems. This report will inevitably produce significant interest in the HVAC community. It would behoove California to take a leadership position now in the deployment and management of GHP systems, which would ultimately result in financial benefit and increased jobs for the state as it adopts this technology.**

Describe any public and/or private successes and failures the technology or strategy has encountered in its path through the pipeline. Summarize other related programs and initiatives in California, such as DOE funding initiatives.

- **The CEC has supported development of GHP applications in several places throughout the state, including Cedarville Weaverville. In addition, a number of small consulting firms around the state have deployed highly successful GHP systems. The “lessons learned” from these experiences document the importance of employing highly qualified and trained individuals and firms to carry out these applications. As well, they also document the key design and installation challenges that must be addressed to assure a successful system. Documenting these successes and the key elements that contributed to their success would be an important public service.**