Response To 4-19-13 CEC Draft Policy for Ground Source Heat Pumps

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Public Resources Code 25228, bolstered by AB 2339, calls for two state agencies and multiple civil jurisdictions to evaluate policies that might overcome barriers to the use of Geothermal Heat Pump (GHP) technologies and to make recommendations in the 2013 Integrated Energy Policy Report (IEPR).

The production of a 3/21/13 workshop at CEC on GHP barriers was an informative and encouraging event—but the 4/19/13 draft CEC policy for GHPs is not. Since the draft included a call for the participation of "technical subject experts" related to GHPs, I will respond in an attempt to show the incongruity between three of the explored issues, CEC's mission, and their rather inflexible posture on GHPs.

While the CEC can be justifiably proud of their 40-year record of policy influence that has kept our state's per capita electricity consumption flat in contrast to the rest of the nation's 50% increase—this draft demonstrates a posture and policy perspective that largely ducks their responsibility to use their powers and influence to remove aforementioned barriers, while actually *increasing* them.

The 4/19 draft policy identified three guidelines for building a policy on page one and then looked at six issues. It

cited issue #3 (Renewable Portfolio Standards) as not feasible to pursue.

Issue 1-
Statutes adopted in 1996 resulted in work by CEC and three other agencies that led to draft standards for geothermal boreholes and wells that as of this writing have still not been finished. This unexplainable lapse has left local jurisdictions free to pursue their own permitting and inspection procedures and fees.

As pointed out by Phil Rawlings in *GeoOutlook*, vol. 10 no. 1, the Project Negatherm database clearly demonstrates the unfavorable contrast between most of California's borehole/well regulations and all of the other states featured.

The reasonable person would expect that having participated in the draft process for geo wells and boreholes in 1999, and having completed biennial IEPR reports since then— that CEC's responsibility for and progress toward finalizing GHP policies and regulations would have been demonstrated by now. At minimum, one would think that CEC would have made an effort to influence or prod the other agencies toward completion.

Fortunately, what I heard from the 3/21 workshop on GHP barriers sounded like DWR finally had a fire under it to complete this work. If CEC was instrumental in this renewed effort, thank you.

Issue 2-
Citation of this concern revolves around the CEC's Building Energy Efficiency Standards. But it places too many barriers and hoops in front of GHP expansion in this state. I acknowledge the terrific past and continuing achievements of Title-24. I used to teach the standards as far back as 1983 and I consider them directly responble for the Rosenfeld Effect of flat electricity growth.

For residential GHP installations, the bullets listed in this section of the draft document are onerous, time consuming, and expensive. They represent barriers added—not removed or minimized.

CEC is asking for some excessive proofs of efficiency. This issue has long since been settled, elsewhere. Are current non-GHP HVAC contractors monitored this close to prove a Manual J or D calculation? Are fossil-based "dual pack" units featuring rooftop placement facing a cool-roof mandate to maintain the highest SEER possible?

GHPs are exhaustively tested and certified (or not) as Energy Star rated. While there may be varied success with "rules of thumb," the geo industry is doing reasonably well on training and certification, and this will likely increase, consolidate, and improve over time. The CEC should not place burdens on this industry that residential HVAC doesn't face.

I do support third party verification of ground loop length per ton and ducting at 450cfm per ton at full compressor

capacity. If installers are trained and certified; if they use factory-supplied geo software, and if we restrict our demands on them to modeling only heating, cooling, and perhaps hot water— then, there is no need to take a project engineer approach to prove operating efficiencies to a regulating agency for residential applications.

Title-24 performs its work as a "how it's built," but there is no guarantee of "how it works" by virtue of the home's occupants. Operational efficiencies go out the window when windows or refrigerators are left open, lights and entertainment appliances are left on, or thermostats are mistakenly set back on heat pumps. Some folks are energy wastrels and we cannot control this. Neither can we make promises beyond heating and cooling costs.

It is my understanding that CEC has no computer resources to incorporate GHP technology into Title 24. For CEC to have tolerated this condition thus far, it is not acceptable for it to condition the lowering of another barrier to GHP by tasking the industry with "solving" this newfound administrative "headache," (which in itself is a *new* barrier).

I suggest greater flexibility. Abandon or delay computer modeling for GHPs within Title 24 in favor of a prescriptive compliance approach:

1. Evidence of heat load calculation?
2. Equipment appropriately sized and rated?
3. Ducting calculation provided?

4. Ground loop sized/installed/inspected before burial?

. . . You're good to go!

Issue 3-
It shouldn't take a meeting comment by CARB to amplify the fact that GHPs "reduce overall electricity production needs." The CEC has made a definitionally precise argument here to exclude this technology as Renewable Portfolio Standard (RPS) creditable.

But the obvious solution to *this* barrier (well within the agency's influence) is to *alter* the definition. Why?

a. CEC has responsibility for forecasting/siting future electrical generation. GHPs work to delay this need.

b. CEC has an interest in reliable electricity supply and for our state, that means controlling summer loads. GHPs shave these dependably while contributing less to "heat islands."

c. A kilowatt of permanent avoided load based on a renewable heat sink is non-time dependent. It's just as effective at 4pm on August 5th as it was at midnight, three days ago.

d. GHP technology is a "multiplier" of electric efficiency. It's twice as efficient as standard air conditioning on 35% less load while simultaneously reducing electric

hot water loads.

e. While ground loop first cost has long been identified as the single largest impediment to consumer choice of GHPs, the most obvious source of potential revenue-based self-interest and on-bill payment is the electric utilities. The potential to re-shape their summer daily load profile is being ignored if RPS credits are out-of-reach. The utilities would otherwise have a justification for loop lease financing; but without some flexibility here, all the other barriers pale by comparison. We are losing the potential to gain *another* incentive through the utilities—that of baseline allowance boosts and better Tier treatment for GHPs.

f. Let's be honest. Subdivision scale installations are needed to catapult this technology into more California homes. Such volume also makes energy efficient mortgage lending more likely. And smart meter technology would allow more comprehensive data collection and analysis to measure collective efficiency by the utilities. Again, take away RPS credit potential and this option disappears.

Issue 4-
I agree with the CEC's review.

Issue 5-
I agree with the CEC's review. But I add that I experience frustration by living in PG&E territory while Plumas-Sierra Rural Electric is less than half a mile away. I had to front

load my ground loop by myself in October, 2011.

Issue 6-
I agree with the CEC's review.

Summary-
I ask that the CEC review their own three guidelines on page one of this draft policy. I believe most of my objections arise from the contradiction between the contents of this first page and their language describing issues 1-thru- 3.

I admit to being a ground source heat pump adovocate. Though I do not have a direct financial self interest, I do support and benefit from the generally enlightened regulatory climate of my state, including AB 32. It would be a shame to leave barriers in place to GHPs while others clamor for boring into all the Monterey Shale formation for encapsulated gas. What an irony if we can't be regulatorily strong enough to demand fracking protections and remain fossil dependent because we've short-changed what I think has the greatest potential to save consumers money and protect the environment since the inception of Title 24.