BUSINESS MEETING

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of: )
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Business Meeting )
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SACRAMENTO, CALIFORNIA

WEDNESDAY, AUGUST 15, 2007

10:03 A.M.

ORIGINAL

Reported by:
Peter Petty
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COMMISSIONERS PRESENT

Jackalyne Pfannenstiel, Chairperson

James D. Boyd, Vice Chairperson

John L. Geesman

Jeffrey D. Byron

STAFF and CONTRACTORS PRESENT

B.B. Blevins, Executive Director

William Chamberlain, Chief Counsel

Mike Smith, Legislative Director

Harriet Kallymeyn, Secretariat

Chris Graillat

Derek Davis

Chris Scruton

Dave Michel

Guido Franco

PUBLIC ADVISER

Nicholas Bartsch

ALSO PRESENT

Shyamal Buch
California State Science Fair Award Recipient

Pete Fonda, (via teleconference)
Meruit, Inc.

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P R O C E E D I N G S

10:03 a.m.

CHAIRPERSON PFANNENSTIEL: This is the Energy Commission's biweekly business meeting. Please join me in the Pledge of Allegiance.

(Whereupon, the Pledge of Allegiance was recited in unison.)

CHAIRPERSON PFANNENSTIEL: Before we begin with the usual business meeting agenda we have a special treat today.

MS. GRAILLAT: Good morning, everyone. I'd like to introduce Shyamal Buch. He is one of our energy and science award winners. These awards are sponsored by the Commission at the California State Fair back in May. Shyamal was in the junior division. He received a $250 reward.

We also gave awards to three other students in the junior division and one in the senior division.

So, we're lucky that he is the only northern California winner, so we are fortunate to have him visit with us today and tell us about his project. Shyamal.

MASTER BUCH: Hello, everyone.

(Applause.)

MASTER BUCH: Who here knows what a motor is?

(Laughter.)

MASTER BUCH: Great. How about a generator? Okay. Then you'll basically understand my project.

Okay, my project is, "Got Motor? Got Generator? Can a Motor Act Like a Generator, and How Efficiently?"

You know how motors uses electricity in order to turn. Well, my question was can a motor generate electricity by turning. Also, how efficiently. My hypothesis was that the efficiency would be 60 or 75 percent.

For my research I learned about Faraday's Law of Induction, Ohm's Law, Lenz's Law, and about how a motor and generator work. I also learned why energy efficiency is so important.

Fossil fuels are a major source of electric power generation; they're nonrenewable; and they lead to global warming because of their greenhouse gases.

Now, the most important fact I learned was that the U.S. power generation system has an efficiency of only 35 percent. So there's a lot

of room to grow. Millions of dollars worth of electrical power are consumed every year. So putting all this together we can derive that just 1 percent improvement in efficiency can save us billions of dollars and reduce greenhouse gas emissions.

I visited the Cal-ISO, California Independent System Operator, in order to learn about the state's power grid.

Following the procedure I came up with a new approach to measure energy efficiency using a micro-computer and motors from my robotics kit. This is a lot less expensive than using the lab equipment needed to measure efficiency, which I thought was a plus.

(Laughter.)

MASTER BUCH: Step one. I started off with one motor and I found out that when you turn it, it produces electricity just like a generator. And that I could use this electricity to drive a second motor. And then my criteria for efficiency, right here in step two, would be counting deriving the rotations out and dividing it by the rotations in. Because efficiency is useful output divided by total input.

I wanted to measure the efficiency very accurately. I didn't want to do it manually, so I added a third motor and connected it to the second motor. And this motor would act like a rotation sensor because the motors had built-in rotation sensors. And then it would send the data to the microcomputer, which would then collect and display. I'll be giving a demonstration of that a little later on.

Here in step four I added a fourth motor because I wanted to, as you see right here in step three, I started off with a hand-crank so I could manually count how many rotations I did, how many rotations in. But with the microcomputer I could also -- I could accurately count it, and I could also vary the speed of the generator.

So, in order for the microcomputer to do its job I provided this program right over here. And it was a program that varies speed and rotations of the generator.

My first set of results that I got showed that the efficiency was 67.4 percent. I derived that from the slope of the line with all the points that I copied on the graph, and with a trend line drawn through it.

My error was small because my R-squared was close to 1, which means that it was almost exactly linear.

Now, for my third graph right over here, it shows how efficiency increases with generator speed. I found out something really interesting about this one. And that was that below the stall speed the motor stalls, obviously, and it doesn't run anymore. Therefore, efficiency is zero according to my criteria.

Now, I had to -- I was sure that the generator actually produced some electricity, so I decided to measure the voltage. I had to do some soldering and I wrote this second program right over here, a program to measure time to complete a certain amount of rotations. That way I could measure the rotation speed and angular velocity.

When I plotted the graph of output voltage versus the angle of velocity I found out that the results were linear, and that the relationship was linear.

Now, I did some more research and saw, you know how Faraday's Law says that the -- TTA is proportional to the number of turns in a coil, and the rate of change of the magnetic flux. Well,

for a generator the equation is EA=KMF, which is basically the EMF coefficient of the generator multiplied by Omega, which is the angle of velocity.

And at steady state the circuit equation of my generator is V=EA, -- and where IA is the armature current, RA is the armature resistance and B is the output voltage.

And so comparing when we combine these two equations and then put it together with the equation of the line, you can derive a KMF EMF coefficient.

The reason this is so important is that it's a mathematical model of my generator. And you can give me any given speed and I can tell how much voltage my generator will produce, which is great because I don't have to keep on doing experiments.

So, in conclusion, I learned that a motor can act like a generator; and my results supported my hypothesis because 67.4 percent is in the range I hypothesized.

I also found out the relationship of output voltage and angular velocity, found out that it was linear. And that I could derive the

mathematical model of my generator from the slope of the line. And errors were small because of the R-squared for both of these linear graphs was so close to 1. It was 0.9992 or 1 - yeah. It was very close to 1.

And so you may be wondering why is energy efficiency so important. As I already told you, even 1 percent improvement in efficiency can save us billions of dollars. I actually calculated it some time ago and it turned out to be $7 I estimated.

But in applications of a motor acting like a generator, why it's so important is that in hybrid cars, you know how a motor, when you apply the brakes to the car, the motor -- it uses an electric motor, and the momentum of the wheel turns the motor, so that it acts like a generator, and that charges the battery, which you can later use to startup or extend battery life basically. And that I think that NASA could use this technique with their Mars rovers and with robots which helps senior disabled people.

And before I wrap this all up, I'd like to thank the Energy Commission for inviting me to present my project to you guys; but, more

importantly, for supporting science fairs and for supporting kids like me that like science.

So, thank you.

(Applause.)

MS. GRAILLAT: I want to add that Shyamal won this award as a sixth grader. He's currently a seventh grader at Folsom Middle School.

(Applause.)

CHAIRPERSON PFANNENSTIEL: I want to say thank you, thank you not just for coming here and presenting this, although it was very important for us. But for the work you're doing. And if there's anybody here who still doubts our ability to match the challenges of global warming I think you've demonstrated to us that your generation is going to lead the way.

Are there questions or comments from the Commissioners?

COMMISSIONER GEESMAN: I'd just comment that I doubt this dude is a seventh grader. I just --

(Laughter.)

COMMISSIONER GEESMAN: -- seventh year of post-graduate studies.

VICE CHAIRPERSON BOYD: My only comment would be that it's a shame that Commissioner Rosenfeld isn't here today. Commissioner Rosenfeld is the acknowledged father of electrical efficiency in this country, if not on this planet. And I would like to have seen him meet his successor.

(Laughter.)

COMMISSIONER BYRON: And I'll add, Shyamal, cool. Thanks for being here.

CHAIRPERSON PFANNENSTIEL: Great job. Thanks so much.

(Applause.)

CHAIRPERSON PFANNENSTIEL: I think we should move on to the rest of our agenda. I don't think there's anything as interesting or as exciting, but certainly some challenges.

One change to the published agenda. Item number 2 will be held for future meeting.

We'll start with the consent calendar. Is there a motion for the consent calendar?

VICE CHAIRPERSON BOYD: I'll move the consent calendar.

COMMISSIONER GEESMAN: Second.

CHAIRPERSON PFANNENSTIEL: All in favor?

(Ayes.)

CHAIRPERSON PFANNENSTIEL: The consent calendar is approved.

Item number 3, possible approval of purchase order 07-409.00-003 for $200,000 to Shandam Consulting for information technology network engineering and architecture services that are highly specialized where the knowledge and expertise is not available within the Energy Commission. Good morning.

MR. DAVIS: Good morning. My name is Derek Davis. I work in the information technology services branch. I'm asking for approval of a purchase order for $200,000 for Shandam Consulting.

This is to provide network engineering and architectural services for the enterprise for security performance and reliability. The Commission's network is complex and highly specialized. Shandam Consulting will provide architectural services to insure best configuration of the physical network, e.g. Cisco equipment and other firewalls and et cetera, for replacement or upgrade as the Commission's need for performance, stability and security.

It will also identify and recommend alternative technologies to improve performance, stability and security.

Finally, they will provide a value insight to industry best practices to complement Commission Staff research on emerging network technologies and issues.

CHAIRPERSON PFANNENSTIEL: Thank you. Questions?

VICE CHAIRPERSON BOYD: I had a question as to -- because there wasn't enough information in the material that I received in the agenda. Did we bid this, did we put out an RFP for these services?

MR. DAVIS: Yes, sir, back in July; and received all results July 30th.

VICE CHAIRPERSON BOYD: So this is the winning bidder?

MR. DAVIS: Yes, sir.

VICE CHAIRPERSON BOYD: Thank you.

COMMISSIONER BYRON: Just one brief comment, and it's not -- I mean I'm certainly in favor of approving this, and it's not in the way of reward, but I'd just like to say that the year that I've been here I've been extremely impressed

with the reliability of the systems that I have in my possession. I take it for granted, but I think it's all worked very well. So if this helps support, continue to support them, I'm glad to hear it.

MR. DAVIS: Thank you, sir.

VICE CHAIRPERSON BOYD: Move approval.

COMMISSIONER GEESMAN: Second.

CHAIRPERSON PFANNENSTIEL: All in favor?

(Ayes.)

CHAIRPERSON PFANNENSTIEL: Approved, thank you.

Item number 4, possible approval of contract 500-06-049 for $600,000 with the UC Center for the Built Environment. Good morning.

MR. SCRUTON: Good morning, Commissioners. I'm Chris Scruton with the PIER buildings program.

And this proposed research program would fund the UC Berkeley Center for the Built Environment to work with leading commercial designers, manufacturers and owners to improve guidelines and technology for designing, commissioning and operating underfloor air distribution systems.

It would also begin to develop guidelines and comfort analysis tools relevant to radiant cooling systems.

Both of these system types offer inherent benefits for energy efficiency and peak electric power reductions, especially in the California climate. And both type of systems are currently being implemented by innovative designers.

The Center for the Built Environment, through this research funding, will be able to offer design assistance, analytical services and develop information resources to make sure these systems work as well as possible.

The PIER Staff recommends approval of this contract. And I'll try to answer any questions you might have.

CHAIRPERSON PFANNENSTIEL: Thank you. I noticed in the writeup there's a reference to using this project for 2008 building standards, Title 24?

MR. SCRUTON: Yes.

CHAIRPERSON PFANNENSTIEL: When will this be available to the building standards staff?

MR. SCRUTON: Actually, the information

that was developed in the previous round of research with this Center for the Built Environment on underfloor air distribution systems has already been used to make proposals into the 2008 standards.

And I think there may be some outstanding questions that this research would help to answer. Although, frankly, the timing may be an issue with the 2008 standards. When this proposal was initially proposed that might have been possible. It may no longer be possible to affect the current round of standards.

CHAIRPERSON PFANNENSTIEL: It shows that 100,000 of the 600,000 would be used for the 2008 building standards. So is that money not going to be spent, then, because it's too late for the building standards, or what's the relationship --

MR. SCRUTON: Well, as I say, the timing could be an issue. But if they miss the 2008 standards then I guess they'll be hitting the 2011 standards.

CHAIRPERSON PFANNENSTIEL: Thanks.

COMMISSIONER GEESMAN: That's not exactly the crispness or discipline to schedule that one wants to encourage in government

contracting. And I don't think this issue was quite as well discovered in the consideration of the contract at the R&D Committee.

So I would suggest that we refer it back to the R&D Committee for closer scrutiny.

CHAIRPERSON PFANNENSTIEL: That's fine with me. Further discussions or questions? Why don't you go back to the R&D Committee and then come back with that.

MR. SCRUTON: Okay. Thank you.

CHAIRPERSON PFANNENSTIEL: Thank you.

Item 5, possible approval of seven grant applications totaling $619,913 in response to solicitation cycle 06-01G of the Energy Innovations Small Grant Program. And for those who didn't understand that from just reading, the G at the end of that means that this is natural gas. Correct?

MR. MICHEL: Correct.

CHAIRPERSON PFANNENSTIEL: Thank you.

MR. MICHEL: Good morning, Commissioners. My name's Dave Michel. I'm the Program Manager of the PIER Energy Innovations Small Grant Program.

This is our first solicitation in this

program for natural gas research. And I bring eight competitively selected small grant projects that have been approved for Commission consideration by the RD&D Committee.

One applicant declined funding after receiving other prime funding. The projects were selected from 30 grant applications received from natural gas solicitation 06-01G.

Nineteen passed initial screening and advanced to technical review; 15 exceeded the minimum required score in technical review to then advance to the program and technical review board. And that's where the eight were considered for consideration.

In terms of the PIER areas which this research is targeting, three are in advanced generation technology area, three in the renewable, and one in the natural gas environmental impact area.

In terms of applicants we received four technologies that are offered by the academic community, and three by small businesses.

The total funding request for the seven projects is $619,913. I recommend the seven projects for Commission consideration and

approval.

I'll answer questions. Thank you.

CHAIRPERSON PFANNENSTIEL: I would also say that I think there's somebody on the phone, is that correct, Harriet, who would like to speak to item 5.c.

MR. FONDA: No, I don't want to speak to it if not asked to.

CHAIRPERSON PFANNENSTIEL: Okay, thank you. Are there questions on any of these items? Or discussion?

COMMISSIONER GEESMAN: I'll move the item.

VICE CHAIRPERSON BOYD: I'll second the item; it was presented to the Natural Gas Committee, as well, and we appreciate the review opportunity we were given.

CHAIRPERSON PFANNENSTIEL: All in favor?

(Ayes.)

CHAIRPERSON PFANNENSTIEL: So those eight projects -- are approved.

MR. MICHEL: Seven.

VICE CHAIRPERSON BOYD: Seven.

CHAIRPERSON PFANNENSTIEL: Seven, sorry. I wasn't reading correctly.

And then you will present item 6, possible approval of nine grant applications totaling $853,675 in response to solicitation cycle 06-03 of the Energy Innovations Small Grant Program. These are all electric, correct?

MR. MICHEL: Correct. Good morning, again. This happens to be our 26th solicitation in the electricity small grant area. And we recommend nine projects that were selected from 64 applications received from solicitation 06-03.

Twenty-three passed initial screening and advanced to technical review; 15 exceeded the minimum required score in technical review and then advanced to the program and technical review board.

In terms of PIER areas, four in the building end-use technologies, two in the environmental, one renewable and one environmentally preferred advance generation, and one industrial/agriculture and water.

In terms of applicants, five technologies were offered by small businesses; three in the academic community; and one by a nonprofit.

The total funding request for the nine

projects is 953,675 (sic), which is well within our budget. I recommend the nine projects for Commission consideration and approval.

Thank you.

CHAIRPERSON PFANNENSTIEL: Thank you. Questions, discussion?

COMMISSIONER GEESMAN: Just to make certain I heard Dave correctly, the amount is 853,675?

MR. MICHEL: Yes.

COMMISSIONER GEESMAN: Okay. I'll move the item.

COMMISSIONER BYRON: I'll second.

CHAIRPERSON PFANNENSTIEL: All in favor?

(Ayes.)

MR. MICHEL: Thank you for both.

CHAIRPERSON PFANNENSTIEL: Thank you.

Item 7, possible approval of contract 500-07-004 for $114,996 with the University of California Davis to investigate climate-induced range shifts of commercially and ecologically important tree species in the Sierra Nevada. Good morning.

MR. FRANCO: Good morning, Commissioners. My name is Guido Franco; I'm with

the environmental area in the PIER program.

Prior PIER research demonstrated that Ponderosa Pine has moved in California about 26 kilometer to the east and about 450 meters up slope. This is -- the conclusion is that this is the warming climate in California.

This is a very important finding and what we're proposing to do is to study ten more species in California. The study will be conducted in area east of Yosemite to see how the lower boundaries of these species are moving, if they're moving due to climate change.

At the same time the scientists believe that temperature may be one of the factors, but the main factor may be the drying of the soil. So because of that they will be installing soil moisture probes to measure how long -- the extended summer season that we're experiencing, what effect it's having on soil moisture in these areas.

So, in general, this project would help us understand the potential impacts of climate change in forest ecosystems. Again, this is a very important project that would complement other ongoing projects that we're funding.

I'm asking you to consider this project; and if you consider that this project is worthwhile, to approve it. I'm ready to answer any questions that you may have.

CHAIRPERSON PFANNENSTIEL: Thank you. Are there questions?

VICE CHAIRPERSON BOYD: Only a comment that I know the precursor research project that was noted in the writeup was a major hit, I guess I would say, at last year's research conference, which I did attend and heard the discussion of these findings.

So I'm pleased to see that we're continuing our work in this arena, because it really was interesting and intriguing to the scientific community, and will be very relevant to our California climate change program.

COMMISSIONER GEESMAN: I'll move the item.

VICE CHAIRPERSON BOYD: I'll second it.

CHAIRPERSON PFANNENSTIEL: In favor?

(Ayes.)

CHAIRPERSON PFANNENSTIEL: Approved, thank you.

Approval of the minutes. And I need

Harriet to affirm that we'll have a quorum of people who can approve minutes for the June 20th business meeting? Yes.

COMMISSIONER BYRON: I believe I was not here for the meeting on the 20th.

COMMISSIONER GEESMAN: I'm afraid I wasn't, either. At least according to the minutes. It's Pfannenstiel, Boyd and Rosenfeld.

CHAIRPERSON PFANNENSTIEL: No quorum for the --

VICE CHAIRPERSON BOYD: I noticed this last night. We weren't going to be able to move this item.

CHAIRPERSON PFANNENSTIEL: August 1st I was not in attendance.

VICE CHAIRPERSON BOYD: I'll move approval of August 1st.

COMMISSIONER GEESMAN: I'll second.

CHAIRPERSON PFANNENSTIEL: Recusing myself. But, all those who were here?

(Ayes.)

CHAIRPERSON PFANNENSTIEL: Those minutes are approved.

Commissioner presentations? Any?

VICE CHAIRPERSON BOYD: Yes, I have one

item I'd like to reference for the Commission's information.

Yesterday Commissioner Byron and myself were briefed by the petroleum industry on the fact that they have submitted a petition to the Air Resources Board, which is fairly unique, but has been done on rare occasions before.

A petition to ask the Board to reconsider its action on the so-called -- what am I trying to say -- predictive model, excuse me. I know it so well --

The Air Board in June took an action at which this Commission Staff participated. They both reviewed and took an action to approve changes to the predictive model and changes to their regulations such that more or less the oil, petroleum industry has to produce E10 in California. And a very novel mitigation strategy was also put in place.

The industry -- and a very short timeframe -- the industry has appealed the item to the new Chair of the Air Resources Board, asking they reconsider the time schedule. They're not questioning the decision with regard to the use of ethanol, but they are questioning the time

schedule which they think was unusually short.

And the so-called novel mitigation strategy has the industry paying to mitigate the increase of emissions were they not able to, within two years, provide the fuel supplies required.

In any event I bring this to your attention only in that we were, through staff, a participant in the public hearing. Staff did testify as to the timeframe that the ARB Staff had proposed. And our staff took exception to the short timeframe, and suggested that additional time would be needed.

Therefore, it's fairly clear that we and our staff will be involved in the event this petition is granted. Now that has not been done as of yet. But if it were to be granted, and I have no idea if it will or won't, we will have to reenter the process and probably be a little higher profile to our testimony that took place at the time. Which, although heard by the Board, was not taken into consideration with regard to changing any of the timeframe that was ultimately approved by the Board.

So, we'll have to watch this issue.

COMMISSIONER GEESMAN: You know, I would observe that one of the things we need to be prepared to reconcile, or the staff needs to be prepared to address, is that in the 2005 IEPR we recommended that the E10 blend requirement go into effect in 2010.

So I think that before we get too engrossed, we need to recognize that either we didn't know what we were recommending, or conditions have changed, or we may have forgotten that we recommended it.

Because I think, to the credit of the Air Resources Board, they recognized the urgency which this Commission had attached to petroleum displacement. I believe they recognized the criticisms which we had focused on the predictive model, and attempted to be responsive.

VICE CHAIRPERSON BOYD: That's a good point, and Commissioner Byron can recall, I pointed out to the folks just yesterday that, indeed, we had taken a position in our IEPR on this subject. And we -- and that had been very prominent in our request that the predictive model be opened up to accept -- to consider the acceptance of additional blends of ethanol in the

state.

And furthermore, I do think that we, as a body, are going to have to take a close look at further testimony that we may make, as an agency, on this subject to reconcile the various positions of -- policy positions that the state has taken on this subject. Good point.

CHAIRPERSON PFANNENSTIEL: Further Commission discussion?

Chief Counsel's report.

MR. CHAMBERLAIN: I have no report to day, Madam Chairman.

CHAIRPERSON PFANNENSTIEL: Thank you, Mr. Chamberlain.

Executive Director's report.

EXECUTIVE DIRECTOR BLEVINS: I have no report.

CHAIRPERSON PFANNENSTIEL: Leg Director report.

MR. SMITH: I also --

CHAIRPERSON PFANNENSTIEL: Nothing going on, Mike?

VICE CHAIRPERSON BOYD: He regrets to say he has a report.

(Laughter.)

MR. SMITH: No, I have nothing specific to report, but I'd be happy to answer any questions.

CHAIRPERSON PFANNENSTIEL: When does the Legislature reconvene?

MR. SMITH: Monday. The party's over.

(Laughter.)

CHAIRPERSON PFANNENSTIEL: And for how long?

MR. SMITH: Three weeks, till September 14th. At least that's the published schedule. Who knows with the budget situation.

CHAIRPERSON PFANNENSTIEL: Thanks. Public Adviser's report.

MR. BARTSCH: Madam Chair, Members, Nick Bartsch, Public Adviser's Office. We don't have anything to report. Thank you.

CHAIRPERSON PFANNENSTIEL: Thank you. Any public comment?

Nobody on the phone.

We'll be adjourned.

(Whereupon, at 10:36 a.m., the business meeting was adjourned.)

--o0o--

CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Business Meeting; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting, nor in any way interested in outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 23rd day of August, 2007.

(916) 362-2345