
II. SECA: QUESTION AND ANSWER SESSION

Joe Strakey: Thanks, Wayne. I'm sure you all have some questions about the program and about what Wayne just talked about, as well as intellectual property and things of that nature. So I'll ask our panelists to come up, and we're going to take some questions from the floor.

Mark [Williams], Lisa [Jarr], Gary McVay, I'm going to ask all of you to use the microphone so that everybody can hear. If we don't get to your questions, just fill out a slip of paper and drop it off at the registration desk, and we'll get back to you with answers as best we can. [Note: None were submitted.] There are still things that are not 100 percent defined, so you may not get the firm answer that you might like. If we do get stumped, we can always turn to our other participants in the program who may be able to answer some of the questions that we can't.

With the remaining time, we'll try to take some questions for the people who spoke this morning. As I mentioned before, we cut off questions so that we could keep to the schedule. So with that, would someone like to start it off?

By the way, before you start, I should mention the following. You know Wayne [Surdoval]. Mark Williams is the Product Manager for our Fuel Cells Program at NETL. Gary McVay is from PNNL, where he manages Materials Programs, and he's our SECA contact for this program. Lisa Jarr is one of our attorneys. She specializes in the intellectual property area and she has had much to do with the development of the "exceptional circumstance" that will provide for limited non-exclusive licensing within the SECA pilot-program.

Sy Ali (Rolls-Royce): Mr. Rudins mentioned he would like to see \$400 per kilowatt by 2010. The speakers indicated values for central power under \$700 to \$800 per kilowatt without indicating the date. When do they expect to get to \$400 per kilowatt?

Wayne Surdoval: The program right now is structured such that the \$400 per kilowatt goal is a 2010 goal. It's pretty clear that we will have three phases. Phase 1 and phase 2 will have less aggressive cost goals. However, they will be aggressive enough that we can clearly get into a broad market even at these initial goals.

Joe Strakey: Keep in mind that we're trying to get to large central station plants using solid oxide technology in the 2015-and-beyond time frame for Vision 21 applications.

Lyman Frost (INEEL): Could you speak a little bit more to the sharing of the intellectual property and how that is going to work?

Lisa Jarr: The vision of SECA was that it would be critical to have the technology developed by the Core Technology Program available to all of the Industrial Integration Teams. Because we are a Government agency, we are restricted by law in taking certain rights from small businesses and nonprofits, such as universities, unless there is an exceptional circumstance under which we feel that we need to do

that. We feel that this program represents such an exceptional circumstance. So we are going forward to get permission to require the Core Technology Program developers to offer to the Industrial Integration Teams a non-exclusive license, under reasonable terms and conditions, for any patented technology that they develop. This option would be available for a period of time — probably a year after a patent is issued — and the Industrial Integration Teams could express an interest in whether they would like to engage in negotiations for such a non-exclusive license. The negotiations would be between the patent owner and the Industry Integration Teams.

Joe Strakey: Let me add to that. There's an important connection between the Industrial Integration Teams and the crosscutting developers of the Core Technology Program. That is the Industrial Integration Teams have something to gain from the technology that's developed by the Core Technology Program. They can get a non-exclusive license to the technology, which otherwise they may not have access to. With the exception circumstance in place, it will be an incentive for the Industrial Integration Teams to act as a guiding body to give the Alliance ideas, through DOE, of what research is important and relevant to the industry teams. We think that's a very important connection, and we're going to proceed with getting that in place.

Lisa Jarr: Right. And the benefit to the core technology developers is that they have a group of licensees for their technology where they can reap some benefit back to their programs. We think it's a win-win situation for all involved.

Wayne Surdoval: We plan to put a substantial amount of the budget into the Core Technology Program because, in return, it does help the alliance. In terms of this program; focusing this program; keeping it focused; if this relatively minor intellectual property change in fact is available, it will be critical to keeping the program focused. Otherwise, there wouldn't be much motivation for all of the participants in the program to work together.

Momtaz Mansour (ThermoChem): On intellectual property, unless you provide reciprocity, so that patent holders of enabling patents also have the right to license stack technology, then you're going to have a lot of litigation on your hands. If there's reciprocity in the program, there will be cooperation. But if you're going to make it such that technology invented somewhere in a small business has to end up in the hands of a bigger company, it's not going to fly.

Lisa Jarr: We're talking about non-exclusive rights.

Momtaz Mansour (ThermoChem): There's no such thing. Once you non-exclusively license the technology, it's lost its value. The other issue is: 18 to 20 years ago, the question was reduction in cost of the stack and the material cost. I remember the number; it was \$285 per kilowatt at that time for a solid oxide fuel cell, and the target was \$400 to \$500. What is new that we know now that allows this target to be real? What is it? Why is this costing so much? Is it the mass production, the lack of market? What is the issue?

Gary McVay: For the first time, we've got the type of industry interested in and committed to making solid oxide fuel systems that has the low-cost production capability for it to become a reality. I mean, that's what these folks, the suppliers to the auto industries, do for a living. So that's one of the new things. And the other thing is that we have a market pull. We have a customer saying "if you can do, we'll buy

it.” We’ve got an order in place for it. And technology has moved along. We haven’t stood still since the time you were talking about, and so we have better approaches to things. I think it’s a combination of technology advancements and getting high-volume, low-cost producers involved.

Mark Williams: I would like to emphasize that there’s been a tremendous amount of progress in the fuel cell industry in the last 18 years, witnessed by numerous scale-ups and improvement in materials and components.

Wayne Surdoval: Some other factors too: One thing we’re emphasizing is high power-density design. If you could increase the power density by a factor of two, you can substantially reduce your stack cost by that alone. We have had a number of studies done. If you look at the material cost at the higher volumes of projected production; the more simple manufacturing methods applicable to flat ceramic plates such as tape casting and screen printing; and if metallic interconnects are viable, the cost numbers do come out to \$400 per kilowatt as a reasonable goal. We have several studies that show this.

Dave Archer (Carnegie Mellon): I guess I wanted to make a special plea for those of us intended to respond to your multi-level fuel cell fabrication proposal. We had hoped to respond to that, and we’re told that a new program that you’ve announced today would be available. But it seems a rather long time to wait from now, when we had hoped to make a proposal to your multi-level fuel cell proposal, to the time when core support proposals will be entertained, approximately a year from now, I guess. A year’s vacancy is a concern.

Wayne Surdoval: Today we are only speaking about the SECA program. There are other programs throughout DOE. There will be many opportunities. There are SBIR opportunities. There are opportunities through AR&TD [Advanced Research and Technology Development]. We actually have a solicitation on the books — it’s written, and ready to be issued shortly — that would be directed to the universities. There will be other opportunities. This is strictly SECA. The SECA program will be an industry-driven program, but there will be other work. We also need to keep other work going to achieve the longer-term breakthroughs that can help us down the road.

Joe Strakey: Let me add that in the Government, the budget cycle is at least 2 years, so making a change in program direction is difficult, and we felt that it was important not to get people started in one direction and then change it once the contracts were awarded. So, with this slight delay, we pay a price, but I think in the long run it will provide additional opportunities for developers in this area, and will avoid early terminations or anything like that.

Gerry Agnew (Rolls-Royce): I’d like to return to an earlier topic and raise a question: What happens to the background IPR [intellectual property rights] for the existing stack development technology people who participate in this? And related to that is the question: For somebody who has the option to be in a vertical integration team or who has stack technology developed in-house, if we go in as a vertical integrator, are we just paying for the development programs that other people were involved in when we have a stack program of our own? How are you going to handle the background IPR for the core developers?

Lisa Jarr: The DOE intellectual property provisions will apply to any of these awards. And for large businesses, there is a background patent licensing requirement. It’s never been invoked, that I’m aware

of, by the Government — at least not by the Fossil Energy program — but it is a statutory requirement. The large businesses will be able to apply for a patent waiver for any inventions that they make under this program. But there is a limited background patent license requirement for purposes of practicing technology developed under the Government-funded program, which in this case would be, I guess, a financial assistance award under SECA. It's something that we really cannot get away from. But as I mentioned, it has not been invoked in any program that I'm aware of.

Gerry Agnew (Rolls-Royce): That would imply then that you don't feel you're building substantially on the existing IPR — the older IPR will be new IPR.

Lisa Jarr: Well, I think the idea is not for us to do fuel cell development, but to help you folks do it. The reason that we would invoke a background patent license would be if you've done work for us under this program and basically put it on the shelf, and we would have somebody that comes to us and say "We want to practice that technology that you paid to have developed," and we need to have a background patent license from Rolls-Royce or someone else. The intention is that you're going to be off practicing this technology in the marketplace and that we're not going to have to get to that point.

Joe Strakey: If there's a market need for a technology that's not being satisfied because somebody is sitting on the invention, that's hard to imagine that's going to happen. I've heard a story that it happened once in DOD, but . . .

Lisa Jarr: Did you have another part to your question?

Joe Strakey: I didn't quite follow the second part.

Gerry Agnew (Rolls-Royce): Yes, the question really is: Will the vertical integrator effectively end up licensing technology that was developed before this program began?

Joe Strakey: Licensing it to core program?

Gerry Agnew (Rolls-Royce): Implicitly.

Lisa Jarr: You're looking at the risk to your existing intellectual property — is that the idea?

Gerry Agnew (Rolls-Royce): Well, essentially, for Rolls-Royce, if we join as a vertical integrator, we're effectively going to be climbing on the back of Honeywell or other people's development programs, and yet we have our own. So, what is the incentive for us to do that? We're just helping those guys in some ways. That's the question in my mind.

Joe Strakey: There's some confusion on this. Your intellectual property rights are the vertical developers' and wouldn't pass on to anyone else. You'd be building on what you've done before.

Joe Strakey: You mean in the horizontal teams?

Wayne Surdoval: Well you can certainly act as a n industrial integration team. I mean a single company can act as a vertical integrator if you can meet all the requirements that will be in the solicitation for a vertical team. I don't really see a conflict myself.

Joe Strakey: More concerned about being of the Core Technology Program?

Wayne Surdoval: Yes, a company can also be part of the Core Technology Program. But in that case, whatever the intellectual property requirements are, you've simply got to accept them. And, if you choose to do that, then you're part of the technology pool. I would fully expect that certain companies would develop intellectual property or technology in-house as part of an industrial team, as well as be interested in what's going on in the core program. The core program is more for breakthrough technology. I would not expect you to be part of the core program if you had a significant prior intellectual property position ready for licensing, and in order to work in the core technology program you had to divulge that. I would think you would keep that in the industry team. There's no reason why you couldn't. That's your choice.

Joe Strakey: Other questions? How are we doing on time here? Are there any quick questions for any of the speakers this morning? You have to come to the microphone.

Steve Visco (LBNL): I have a question. It's kind of an organizational question. It also ties into IP [intellectual property]. If you have these kind of integral, vertical teams, which are, say, self-contained, but they can license technology from these horizontal core technology teams, you've also got the issue of these horizontal teams working, I assume, with the various vertical teams. And there's always this problem of cross contamination. I mean, there's going to be some sensitivities, I would think. You've got a hot project going in a vertical team; you've got members from horizontal teams who are seeing everybody's technical problems and trying to solve them. How are you going to keep the barriers there? How's that done in terms of intellectual property and how these two teams work with one another on two sets of teams?

Wayne Surdoval: I think that's up to the participants. We recognize that cross contamination could exist. I think the national labs in particular deal with that all the time.

Joe Strakey: Let me add to that. I think that maybe there's some misperception. The idea is that the industry team would provide input to the Government. DOE would decide what topics should be pursued on the horizontal teams, and we would issue solicitations. So, it's not like the horizontal team members would be working daily with each one of several vertical developers. I think that probably solves it.

Steve Visco (LBNL): So you will have separation?

Wayne Surdoval: Yes. The core program will consist of very specific contracted pieces of work.

Joe Strakey: See, it goes through our project management. You've got industry input, which feeds through project management, and it keeps it separated that way. Okay, we got a couple more.

Lyman Frost (INEEL): Let me ask one more question, following up on what you've just said. Underneath Federal law, the national labs are not allowed to work exclusively with any particular company. They have to be able to go to any of a number of companies if they want that area of

expertise. Are we going to be able to work exclusively with industrial companies to protect their technology base in this area?

Lisa Jarr: Maybe I don't follow completely the restriction on the national labs, but I think . . . you're talking about in the core development program now?

Lyman Frost (INEEL): Yes, in the core development team, if more than one company wants to work with you in a particular area of technology, you have to be willing to work with each one of those equally. So the question I have is: If we were working on one of the core teams, would we be able to work exclusively with an industrial team in a particular area of technology?

Wayne Surdoval: I think in the core program, assuming things go as planned, you would almost by definition be working for everybody.

Joe Strakey: For the public, yes.

Wayne Surdoval: Now, in the other sense, if you wanted to establish a CRADA with a specific company, within the rules of establishing a CRADA, that would also be acceptable.

Lisa Jarr: I think, in that case, you probably would be talking about working with one of the industry integration teams versus the core program. Then, whatever rules and restrictions fall from contracting or doing CRADAs with a certain company would apply. We anticipated . . . and we've had national labs as subcontractors or team members on these teams before . . . and we anticipate that that could happen under these industry integration teams also.

Gary McVay: Almost by definition, when you're working on a core team problem, you're working with all of the industries. They all are interested in the solution of that problem and will receive the output of that research.

Joe Strakey: Just like any national lab project now. I don't see any difference except for this one of intellectual property.

Joe Strakey: Last one before lunch.

Ismail Celik (WVU): I am from the University. I see one component missing from the SECA program. That's the education of the engineering students for supplying the demand for this mass production and maintenance and all these . . .10, 20, maybe 30 to 50 years. How do you envision supplying this demand without a program in curriculum development in solid oxide fuel cell technology or in general fuel cell technology?

Wayne Surdoval: We're working on that now. As I said, the SECA program certainly encompasses universities. And when you encompass universities, typically you are training grad students. At the same time, we have other solicitations available. There is one that is not on the street quite yet, but when you read it, it is specifically written to enhance educational opportunities and support graduate student training for solid oxide fuel cell work. Again, there are other funding avenues besides SECA. This is strictly SECA. This is a very short-term industry driven program.

Joe Strakey: I'm going to have to cut it off because were running late.