

Advanced Turbines for Industries of the Future

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Good morning. I would also like to extend my welcome to participants at this ATS conference. I am going to go briefly through my talk and see if I can catch up some of the time. I would like to say that we also consider the ATS Program to be a model between DOE's EE and FE Offices, the DOE Office of Industrial Technologies, industry, universities, and national labs. It continues to be a strong, healthy program. I hope that you will take a minute with me to feel proud to be involved with this Program — and maybe also a little lucky to be involved with this Program, because it is pretty exciting. Good progress continues to be made in many areas, and we look forward to hearing more about that in the next 2 days.

On the energy efficiency (EE) side, we have the lead in industrial-scale turbines, supporting materials research, coordination of biomass applications, and coordination with the EPA. So I will address the EE side of the ATS Program. Technically, what you will hear about over the next couple of days are several successes. In materials, you will hear about the manufacture of very low sulfur castings. You will hear about success in thermal barrier coatings, which has already been alluded to. You will see an unveiling of an ATS engine model. We'll be very excited to see that and I hope you ask lots of questions. You will hear about the ceramic engine testing, which continues to set the world pace for advances in turbine technology. But most important, you will hear about how our industrial partners are meeting ATS goals. Financially, we are also doing fairly well as Joe described. The EE budget for the ATS program in fiscal year 1998 is \$34 million. This is fairly healthy from where we started in 1992 at near zero. We have come a long way since the kickoff meetings in Clemson.

Let me spend just a couple of minutes talking about some important issues that you may not hear so much about at this meeting, some of which Joe referred to when he started talking about global climate change and some of the pressures in Washington. First, over the last year, we supported efforts to understand the distributed generation potential of the United States and how changes in utility regulations can affect our development programs. This included support for studies under the auspices of the California Energy Commission. I served on a board called the California Alliance for Distributed Energy Resources (CADER). The Board had a summary meeting in early September attended by representatives from 22 other states. I think that shows how much the rest of the country is watching what is going on in California. A memorandum of understanding (MOU) resulted that includes both EE and FE with the California Energy Commission. This MOU is looking at how you might leverage these public R&D dollars jointly with our dollars to get the most for our money. I see that as happening, and there will be

joint projects with the California Energy Commission. We talked about the generation side of the activities. EE is also coordinating with FE, EPRI, and GRI as they push forward with their distributed generation effort.

We coordinated with the Distributed Power Coalition of America at a superb conference in Washington in September. We were able to get speakers who, I think, talked about the major issues. I think back to a few years ago — about 2 1/2 years — to a meeting in San Francisco. EPRI, GRI, and PG&E (in one of its last acts), and DOE sponsored a conference on distributed generation. We had a tough time then just defining what we were talking about. You notice that I went back to the time when most utilities had at least addressed the topic. Not too many things were implemented then, but most people now are looking at it, understand it, and generally pretty quickly begin to know what others are talking about. I think there has been tremendous change since that time, and I think this ATS Program has been part of that change in understanding what the potential is for distributed generation.

We have also been able to sponsor debates in Maine and West Virginia on distributed generation restructuring. It was very interesting to stand here in Morgantown and listen to the chair of Allegheny Power debate with environmental consumer and industry groups about what is going to happen with utility restructuring. It made a very entertaining afternoon. We are also sponsoring a study with EPA to look for potential environmental benefits and impacts of distributed generation. This study should be completed in the first quarter of 1998. And there are similar studies on climate change issues, affectionately called the Five-Lab Study, the Eleven-Lab Study, and the Congress Study. All these studies look at different aspects of what the administration could do to mitigate carbon emissions.

Early this past summer, the Combined Heat and Power Coalition (CHP) was formed between industry and environmental groups, and DOE and EPA participated. The goal of this coalition was to examine market barriers for industrial-scale technologies that could impact global climate change. This group sought three things. They sought environmental permitting, which is faster and less prohibitive for new efficient technologies. Skip Laitner will talk more about this in his talk on the EPA in just a little bit. Second, we asked for open access to the grid with no exit fees for CHP technologies. And we asked for adjustments in the depreciation rates for CHP technologies. This initiative favors no specific technology, it simply asks for access for these kinds of technologies. It also asks for removal of the barriers so that we can get major carbon engagement.

Several sources indicate widespread adoption of this initiative, which will provide 35 to 40 metric tons in carbon reduction, which is approximately 10 percent of the U.S. target. This is why Tom Caston, President of Tri-Gen, was part of Mr Clinton's global climate meetings, which, by the way, was covered on CSPAN on October 6. This is why Secretary Peña was in Philadelphia yesterday to dedicate a new co-generation facility that shows greater than 90-percent fuel efficiency.

Clinton talked a little about his middle-of-the-road approach to climate change, one that will embrace both technology solutions and tax cuts. He committed additional R&D expenditures beginning in fiscal year 1999. These R&D funds will be used to do the following: (1) to finish

the ATS program as soon as possible, which is our number one priority; (2) to work in other areas, such as micro turbines, fuel cells, and supporting technologies; and last, (3) to aid and deploy information on CHP technologies to help their advance into the marketplace as these barriers are removed by the President. Of course, we will be watching what happens with the Kyoto Protocol with great interest.

The third major broad activity that the Office of Industrial Technologies has worked on has been the Industries of the Futures Program, which we have been engaged in for the last 4 years. This program encourages industries to produce their own visions of their future with accompanying road maps that identify technologies, paths, and schedules. To date, six of these visions have been completed with a number of accompanying road maps. You can get access to this information on the EE Homepage, and there is a booth outside this room that you can take a look at. This has been a very successful partnership, perhaps even better than what the ATS Program has achieved.

The forest product industry targeted six major areas that they wanted to work on, and one of them was environmental compliance. The EPA says that part of the next round of the clean air act will be the next ratchet down in emission levels. The forest products industry went to them and said we can do what you say we must do, but we produced this vision and we can show that we can exceed your goals at a cost of \$3 billion. Your solution costs \$11 billion. If you let us, we will go forward and we will exceed your target levels and will also save ourselves \$8 billion. It looks as if EPA is going to say, "That is a reasonable alternative, and more than that, it is a major milestone."

Some of these visions include self generation with co-generation options. For example, there is interest in forest products and the chemical industry's multiple demonstrations of ATS technologies. We will continue to pursue these opportunities as we get closer to the ATS demonstrations just a year or two down the road.

So in conclusion, there is considerable activity in the ATS Program, and considerable success in the ATS program, and there is also considerable effort and support of ATS technologies in trying to open up the path to commercialization. We are in a great partnership with industry and others and we expect great things to come from this program.

I would like to take a moment to acknowledge the EE staff here today and I ask that they stand: Pat Hoffman, the ATS Program; Merrill Smith, with the CFCC Program; Debbie Haught, working on micro turbines; Steve Waslo, Industrial Program Manager; and Mike Karnitz, Oak Ridge Materials. Again, I want to thank these people for their great efforts. I hope you enjoy the next few days.

Thank you.