ORANGE COUNTY

CLEANTECH SYMPOSIUM SERIES

SECOND CLEANTECH SYMPOSIUM

Date:	January 21, 2009
Time:	8:00 a.m. - 11:15 a.m.
Location:	UCF Executive Development Center 36 West Pine Street Orlando, Florida
Reported by:	Leslie Richmond, RPR

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Second Symposium, January 21, 2009
Downtown Executive Development Center
University of Central Florida

Sponsored by: AquaFiber TECHNOLOGIES CORPORATION

Agenda – Current Trends/Opportunities

8:00 - Registration

8:15 - 8:20- Opening Remarks & Welcome – John Lewis, Economic Development Administrator, Orange County Government

Review of Orange County Clean Initiative
Discuss Next Step in the Process

8:20 – 8:30 - State of Venture Capital Investments in Cleantech for 2008 – Kirstie Chadwick, Director, UCF Venture Lab

8:30 - 9:00 - Overview of Cleantech report/study – Dr. Sean Snaith, Director, UCF Institute for Economic Competitiveness

Marielle Granjean, Cleantech Project Lead, UCF Institute for Economic Competitiveness

- Purpose
- Data Collection
- Define resources
- How used

9:00 – 9:45am - Summarize Current Trends/Opportunities – James M. Fenton, Director, Florida Solar Energy Center (FSEC)

- Hot Topics in Clean Tech
- Sharing of Information around the Hottest Focus Areas

9:45 – 10:00am Break

10:00 - 11:15 - Major Company Presentations
Discussion areas within segments such as energy generation and storage, transportation, water, building codes, environment/air, and other areas that are gaining the most attention both from investors and economic development agencies in the leading clean tech regions.

- Siemens Energy Orlando – Frank Bevc, Director, Technology Policy and Research Programs
- Mitsubishi Power Systems Americas – Jim Williams, Vice President, Service and Manufacturing Operations

11:15 – Closing Comments

P R O C E E D I N G S

MR. LEWIS: All of us who are speaking today need to stand at the podium, and, Sean, you can't go wandering around like you usually do or we'll miss you on Orange TV.

Good morning and welcome to our second Cleantech symposium. Our first symposium was held on November the 5th, the day after a long election day. I stayed up until 3 o'clock in the morning or a little later than that myself that night. Today is our second symposium and it's the day after a very long inaugural day. We've got to stop meeting like this. Our next symposium is February the 18th, and I looked in Google and I couldn't see anything exceptional happening on February the 17th or 18th. I think 18th is Gambia National Day and so I don't think we'll lose too many people from that, but by February the 18th, I think we'll be back on a schedule that is a little more in sync with everyone else's schedule.

Meanwhile, I think we've got a very exciting agenda today that's going to keep everyone on the edge of your seats. Our purpose, of course, is to become educated about, learn about and help promote Cleantech economic development in not just Orange County but Metro Orlando and Central Florida. We have a lot of partners in this

endeavor. I mentioned at our first symposium that 15 years ago when I came here, our partner really was the Economic Development Commission in terms of economic development. There was no Enterprise Florida at the time, we had no technology incubator, we had no venture lab, we had no SBDC, at least in the way we have it today. We didn't have the Institute for Economic Competitives. We have all those entities today. And so when we look in terms of economic development, all of those entities are part of our economic development strategy. So now we've got look beyond that to Cleantech and recognize that the Florida Solar Energy Center, the Nano Technology Science Center, all of those institutions and programs at UCF need to be an integral part of our economic development program. So I want to especially thank our key sponsors for the Cleantech symposiums and especially the UCF venture lab which is managing and moderating the symposiums, and also the UCF Institute for Economic Competitiveness that is conducting a companion economic Cleantech study.

A number of cities and communities have already completed their cleantech studies, San Diego being one of them. This was in the reference guide that we distributed at the first symposium, but if you look at Boston, Austin, and about every place in between, you'll

find some sort of Cleantech studies or Cleantech symposium series of round tables. In a lot of those communities, they do the Cleantech study first, then they start a round table session to figure how to implement it. We've kind of looked at that and learned from that and are conducting them both at the same time. They were a little bit out of sync in the beginning just because it took a little longer to implement some of the steps in terms of the Cleantech study, getting a project manager on board and getting the internship team together and so forth, but everything is in sync now and we're running fairly smoothly.

I want to, before we begin this morning, especially thank two other sponsors. One is AquaFiber. They're helping to sponsor today's event and I would encourage you to look at their website and see what they're doing and commit a little bit of it to memory. When we first started this whole endeavor, we knew that Cleantech was the buzz word in San Diego, Boston, and Austin, but we didn't know exactly what that was, and when I would ask people, well, name five Cleantech companies in Orlando, we all had a little bit of a difficult time doing that. We've come to find out that there are at least six or seven emerging start up Cleantech companies that are being serviced by the venture lab and the technology

incubator. They were the focus of our first symposium, along with the institutions and entities and centers at UCF. But we've also come to realize that, gee, when you look at some of our largest employers, they have a significant amount of Cleantech also. Siemens Energy, Mitsubishi Power Systems, for example. And those presentations are the key part of today's presentation. But I want to thank AquaFiber for sponsoring today's event. I encourage everyone to go into their website and see more about that.

Also, I want to thank Sweet by Good Golly Miss Holly in Waterford Lakes for providing the breakfast cupcakes today. My motto has always been that a cupcake a day is okay. So maybe you want to adopt that as your New Year's resolution and support Sweet. And there is their phone number, and I encourage you to go to their website and see all the things they can do for your next event.

I also want to thank, and I think we all need to thank, Orange TV, Barry Keller, Orlando O'Heather and Mike Buslovich. They're the staff today that are videotaping the seminar series. As you know, we provide a transcript, full transcript, of every word that is spoken at these symposium series, and we have videos of every single presentation. Hopefully, in the next

couple weeks we'll have a new Orange County website with all that material on it. In the meantime, I think you were all e-mailed that material. I hope that doesn't keep you from coming to these symposiums. It occurred to me that, gee, I can get the transcript, I can get all the videos, why show up at 7 o'clock in the morning. But if you do miss the symposiums, I think you are missing a lot because you're not part of the discussion. The audience today and our other symposiums are really a critical component of the symposium series and the study. In the Cleantech study, for example, there will be a section that lists all the companies and organizations that have an interest in Cleantech and support Cleantech, the contact information, a description and so forth, and if you haven't been contacted yet in order to -- for us to collect that, you will be, because we want to present very fully the full extent of our Cleantech community here. And Orange TV is doing all of the videotaping of all of the sessions, and I think they should be applauded for that because Orange TV, just as with other counties and other departments and groups in Orange County, have to watch their budget, and they're under the Budget Act, and so I'm trying to do all I can to express our appreciation for Orange TV this morning. Let's give them applause.

Also, we, of course, want to thank Jim Weaver and the UCF Downtown Center for hosting these events. This is a great room and a great facility to have these events in, and we thank Jim Weaver and UCF for that.

One of the -- a couple of slides that I -- and I've got five minutes so I figure I've got about four minutes left.

I want to emphasize at least where we are in terms of just knowing what Cleantech is. These are from our first symposium. Cleantech encompasses a diverse range of innovative products and services that optimize the use of natural resources and reduce the negative environmental impact of the use while creating value by lowering cost, improving efficiency, and providing cleaner performance. To me, that's probably the best definition of Cleantech that I have come along, yet includes all the aspects of Cleantech. That definition may change a little bit as Marielle and Sean move forward with the study and we hear from you, but that may be a good starting place as a definition from Ernst and Young. If you look through there, there are really three elements of that. One is innovation, one is green, going green, reducing negative environmental impacts, and the other is value added. So an easy way to remember what Cleantech is is a very -- by a simple

formula. Cleantech is equal to green, plus innovation, plus value added.

Clean is more than green. Cleantech economic development means attracting, creating and growing the innovative high value companies that produce the products and provide the services that will allow us and the rest of the world to go green. A working definition of Cleantech, again, that might be adjusted or modified somewhat as we hear from you and as we move forward with the symposium series.

There are two parts, of course, to our initiative. The Cleantech economic study is we'll look at our assets, our capabilities, our potential, and the possibilities, what we hope to come out of from this Cleantech series. And the study is maybe five to ten very actual items that can be part of Mayor Crotty's lasting legacy in getting those started and also provide a starting place for the new mayor. So there's a rhyme and reason for having this economic study provide guidance. With all of the Cleantech expenditures coming from hopefully the new Obama administration, there is going to be the money to do some of these things. And, of course, as I mentioned, the Cleantech symposium series, which is an integral part of the study, we take information from the symposiums, it goes into the study.

As the studies develop, information and questions and surveys will be coming out of the study for you to participate in.

So that's really where we are with the Cleantech symposiums. Thank you all for coming. Kirstie Chadwick and Christa Santos who's working with Kirstie have just done an outstanding job in putting these together and managing them. At our February symposium, we hope to have Jacques Chirazi, who is the manager of the San Diego Cleantech initiative, here to tell us the San Diego story so we'll learn from them. Along the way, if you have an inclination that you would like to contribute and help sponsor one of these symposiums, such as AcquaFiber has stepped up to do today, please let Kirstie or I or one of the other people associated with the effort know so that we can engage you. Bringing in someone from San Diego involves a little more expense, so we're especially looking for someone to help sponsor that event.

And I also want to recognize our court reporter today who's with Zacco and Associates, and she is the one that is sitting in the front row and taking down every word that you say. So every word that you say means something and we are going to keep it forever.

Thank you very much and it's my pleasure to

introduce Kirstie Chadwick, the director of the venture lab, who will be our moderator for today, and one of the things that the venture lab has done is joined the Cleantech network which is probably the world's premiere organization for Cleantech companies, investors and organizations interested in Cleantech. And Kirstie and Sean Christenson with the venture lab have attended these forums in Washington, in California, and they're bringing back what they have learned to share with you. And the first time we're doing that is with Kirstie this morning. So I think I already used a minute or two of her time, so I apologize for that.

MS. CHADWICK: Thanks, John.

MR. LEWIS: Thank you very much.

MS. CHADWICK: Okay. If I can find my slides here. Okay. New Microsoft. Where is the little icon.

All right. As John mentioned, I'm the director of the UCF venture lab, and for those of you who are not familiar with the venture lab -- so the venture lab is four years old. It was founded -- it's a joint partnership between Orange County, UCF, the high tech corridor council, and a little support from an angel investment group called the Winter Park Angles, and its function is to help very early stage technology start ups that are interested in getting things going from --

as a business entity to do just that. So we help them with their business planning, potentially with fundraising, just sitting there as coaches and mentors. We're a group of folks that have all had our own companies, we've all raised venture capital, stuff like that. It's just a free resource that's available solely for technology entrepreneurs that are wanting to start high tech businesses in Central Florida.

Today, I'm here to chat about some data that I picked up as part of being a member of the Cleantech network, and this particular organization focuses on early stage Cleantech companies, and it's integrally tied to the venture capital community because so many of the economies that are based on Cleantech have a fundamental threat of early stage venture backed technology companies. So the investment world in this particular domain is particularly important to economic development. And then that, combined, of course, with the established corporations like Siemens and Mitsubishi and what not together are what would be -- what make these economies out like in California and Austin and what not hum and use this Cleantech domain as a foundation for doing that.

Okay. So my presentation is their data, not mine. I want to make sure everybody's clear that this is

coming straight out of a presentation basically cut and pasted from, with permission. So this is -- starting last year -- actually, the last six years in the world of venture capital have been rapidly growing with respect to investments and Cleantech. And so last year was the sixth consecutive year where there was a large growth, as was the case in pretty much everything else. Q-4 pretty much stunk and we'll see if that rebounds here. But this particular subdomain in the world of venture capital probably has the best chance of rebounding if anything does.

Solar was the dominant investment theme. However, we'll talk about that more later because early stage investments in solar are not necessarily growing, but the later stage large mezzanine type rounds are. So we'll get into that.

Smart grid and wind and biofuels were the other sections that did well, but solar dominated with 40 percent of the investments going into solar.

2009 was a year of transition that the group expects, you know, this year to also be depressed. No surprise, I'm sure. Everything else is in the same boat. But in the long run, the drivers that are driving the Cleantech focus and investment will remain intact over the course of many years, and so, therefore, the

group believes that in the long run this particular section will continue to be a strong one to focus on. That's just because China and India are going to continue to grow and migrate towards the middle -- upper middle class. Therefore, their energy demands are going to grow, which is going to create that shortage, which is driving some of the efforts that we're all focused on. Of course, climate change is still a key issue as well.

Okay. I think I've covered this and, for the sake of time, I'm going to keep trucking through slides. As we already mentioned, Q4's very significant downturn. The last time they say that big of a drop in that particular sector was back in 2006. As I had mentioned previously, 40 percent of the venture capital dollars went into solar. You can see, you know, based on this particular chart how big of a differential there was between solar and the next largest category, which was biofuels. And then the other categories are, you know, in single digits with respect to percentage of total dollars invested.

Okay. Solar. Let's start with that. I'm going to go one by one through the subdomains. This particular group, again, which spends their entire, you know, function of focusing on venture capital investment in

Cleantech, feels fairly strongly that solar is experiencing a bubble. And that's real important for us to pay attention to because of where these VC dollars are with respect to again economic development. These early stage companies are often the drivers. Most of the dollars that did get invested last year were in thin film PV, which is up 315 percent from 2007. You can see the big jump there. The second highest category was concentrated solar, which sounds like it was huge with 672 percent, but it had a tiny base to start from. We've seen a couple of those companies coming through both the Winter Park Angels and the venture lab. So even here in Central Florida, there's a couple of companies in the concentrated solar space that we're aware of. But, as I mentioned, the reason these numbers are so skewed towards solar is because there is these huge mega rounds of mezzanine and later stage funding going through which are kind of distorting the numbers, because if you look at the seed stage dollars, they're very consistent every year. They're not increasing. So there is not new early stage investment increases going on in solar, only later stage. So that's a sign that that particular market is maturing, and from an innovation perspective, we may want to start looking, you know, at some of the other categories.

Just to reiterate the point, the top 10 deals done, every one of them was over a hundred million dollars in a single round of investments in those companies, so -- and we'll get into the other domains and you'll see the difference. So it's, again, later stage.

Next category is biofuels. It was -- there was an increase last year from 2007, but it's down from 2006. This particular metric occurred this way because of the backlash on using corn as ethanol, and so as many of you know that have studied or paid attention to this, the food shortages were creating -- people -- that's on TV, isn't it. Anyway, corn was the foundation of the first round of biofuels, and, of course, with all the food shortages in third world countries, the press got a hold of that, and turned out that ethanol is not necessarily as effective, or it's -- actually, my gas mileage in my car is worse with ethanol and certain things like that. But it did increase this last year, but it was led by algae and cellusotic type of technologies. And they had been grossing -- there's a belief that this particular subdomain will continue to grow. We have some great research going on in this domain out at UCF. Dr. Henry Daniels is doing some good work there, and I'm sure there is many other efforts throughout the state and in our state universities and definitely the national level

as well. And to, you know, point out the difference, this was the second largest category. There was only one deal over a hundred million dollars in this domain in the top 10 deals done last year. And No. 10 was at 31 million, which is still a large, you know, nice mezzanine round, but it's a much more rational number than what we saw in solar.

Next category is energy storage. This would be batteries and fuel cells and stuff like that. There is a migration going on from fuel cells, which was the focus a few years back now to advance battery technologies. In particular, lithium ion batteries are dominating. This category was much smaller as the third highest category compared to the previous two. So even though one particular technology is dominating, which is lithium ion, you can see that the other subcategories in this particular field are still very small.

Wind. Wind is rebounding, however, the -- there has been a kind of a transition. In the early days of the focus on wind, there was a lot of investment, large investment, in wind farms because there was already wind turbine technology out there that worked and continues to be a stedfast, you know, solution for harvesting the wind power, so -- but those dollars are drying up, at least with respect to venture capital. That does not

mean that the larger energy companies are not investing in this. It just means VC's have considered it a mature technology and, of course, they focus on innovation. So instead, with respect to wind, the focus is very much on technologies that can optimize in a subcomponent type of fashion within those larger turbines and other types of harvesting technologies. So wind is a very young category. Again, the biggest deal was very large, but that was, you know, working on a large generator. But the -- No. 10 was only an 8 million dollar deal. That's an early stage VC type of a round. So very young categories. If anybody knows of any wind technologies going on that are, you know, components that can value add into the large farms or be sublicensed into the larger companies, this is where we should focus.

Okay. Welcome aboard, Obama. He, before he even started, has been campaigning and articulating that he's already putting initiatives or has intent to put initiatives together for green building certification, lead certification, and what not. That is a -- Jim Fenton from FSEC is here and he's going to talk for half an hour as our keynote here today, and this is a particularly strong area for the Florida Solar Energy Center, which is a UCF research center. So this is good for our region for a lot of reasons. First of all, it's

a great way for local governments to do incentives, but also it's an area that we have some domain expertise that we might want to focus on.

Water is actually a personal favorite of mine because if I had to hedge my bets and if I decided to start an early stage company tomorrow, I would probably bet on water because it has all the criteria for somebody trying to, you know, start something, because you always have to be ahead of the curve and you have to, you know, kind of look ahead and see where the problem's going to be. And water is going to be a very scarce resource somewhere in the next decade, and when that happens, trust me, the world will begin to panic and people will start paying top dollars for technologies that can optimize water. So it's very young today, very kind of hypothetical out there in the VC world. The VC's tend to not invest in this stuff. But things like memory technology, decelination optimization, you know, pollution control, that kind of stuff, I think, is critical.

Okay. So I'm going to switch gears for a quick second and just chat about venture capital. No surprise. We don't have a lot of venture capital in Florida, especially early stage. Everybody that knows me knows this is my particular pet peave. And, once

again, the numbers, you know, are pointing this out. This is a listing of all the VC's that invested in those top 10 deals of each of the different categories. Not a single one of them is anywhere near Florida. Most of them are all in California, as you might imagine, but, you know, Austin, Boston, all the usual areas. And, as John pointed out, California, Austin and Boston also happen to be the areas where Cleantech is a core foundation of their economies. So there's a direct link in my opinion of venture capital early stage companies and the maturation of these types of economies. So, once again, we need to pay attention to not just do we have the right technologies and the right people, but do we have the capital to fund these companies and get them started, which, frankly, right now, we don't.

So just to wrap up, as I already mentioned, green buildings is on the queue as a potential hot topic for next year. There's a lot of government focus on it as well, so a good place to potentially focus on. The other areas are grid -- smart grid technologies. So anything that can optimize, you know, our grid, which, by the way, is one of the poorestly run grids in the entire planet. Pretty sad. Part of that is because we were one of the first ones to implement one; therefore, we're dealing with data technology. So there's a lot of

focus on how to get that up to the standards that the rest of the world is already on.

And I guess that's it. So I only had 10 minutes and I think I also went over. So, once again, we're --

MR. LEWIS: Any questions of Kirstie?

MS. CHADWICK: Any questions? Not that I have the answers, but I'll do my best.

Cool. We'll keep it on time.

Now, I'm going to switch over and be the MC. That's my other function today. Next up is Sean Snaith with the Institute for Economic Competitive- --

MR. SNAITH: Competitiveness. It happens to everybody.

MS. CHADWICK: Sean and his people are the folks that are spearheading the studies that John was referring to, so him and his team are going to spend the next 20, 30 minutes chatting about that. One of the key things we need from you and one of the core missions of this series is input from you. We spend a lot of time up here rattling on, and we potentially will today, but, please, if you have input that you would like to share, the best thing you can do is engage with Sean and his group because the whole reason we're doing this is to let people know about this study so we can get your input into it.

With that, back to Sean Snaith.

MR. SNAITH: Thank you. Good morning, everybody. Appreciate you being here, certainly in some challenging times economically and in terms of financial markets, and I think that makes the efforts of the symposium in this study all the more important. Markets can be a cruel teacher, and I think we've all had some lessons in diversification lately, both in terms of your portfolios, but also in terms of the economy, and what's developed out around the UCF medical school and the pace with which that's occurred is an important advance, and it's helped ease the impact of the recession here in the Orlando Metro area. And I think it's the region's really unique affinity for partnerships that was behind the pace with which those developments occurred, and I think that's going to be a big part of what drives this Cleantech initiative as well. It's government, it's education, and it's the private sector working together to come forward with a plan in a very, you know, challenging environment. Not just the funding side of things, but what's happened in energy markets. You know, the Cleantech initiative and sectors impacted when oil goes from $147 a barrel down to below 40, and we have to be able to adapt to those changes. So we look forward to working with you all as we transition in

these next symposiums to a more interactive, more feedback, more of that partnership working to shape the final project.

I've been awful busy with the way the economy's been lately, and, heck, just trying to keep track of the tarp plan, what they're doing with that from one day to the next occupies a good share of time. So I was speaking with John about bringing someone on to help manage this Cleantech project, because it really needs someone to focus on it, and I think it went from our lips to God's ear because within a day a resume came across my desk, and this person, Marielle Granjean -- my French is not so good -- she's taking over as the project manager for this Cleantech study and the institute and she's got 15 years of professional experience in policy analysis and project management. She's got a bachelor's degree from NYU in economics, she's got a master's degree in public administration from the Kennedy School of Government, Harvard University. She has worked for the United Nations, a Democratic Republic of Congo, and in the Central African Republic, and so both John and I agreed she's probably well hardened to deal with county government. And without any further adieu, I'd like to introduce Marielle who will give you an overview of our study.

MS. GRANJEAN: Good morning. Before I start, I just would like to inform you that the presentation today will not be about any -- this presentation will not provide any specific data or details that will be included in the report, so our job today will be to map out the process, to let you know about what we intend to do and what will be in the report and how we're planning to get there.

First, it's very important from the center complex to assert itself. As for any major development agenda, we have to start from where we are. As you understand, there's a growing demand for cleaner products and services. For the past couple of decades due to growing awareness of climate change and developmental challenges, consumers and businesses have been demanding cleaner products that not only reduce pollution but also reduce cost and use less resources.

Secondly, we have to take into account the economy growth opportunities that exist with this. You know, as there's a new economy that is emerging out of this. You know, as we are trying to address the environmental challenges, we understand that Cleantech provides great tremendous opportunity for economic growth, not only for companies, but also for cities, states, and countries. The GE chairman, Jeffery Immelt, himself, he says that

green is green. Since then, this has been very popular. This is a recognition that environmental thinking is more than just an ability, because, as you understand, I don't know who it was at the previous symposium that talked about the fact that green is better -- clean is better than green because it -- clean provides this economic aspect that was inexistent in green technology. Also -- so Cleantech has fostered economic growth through innovation, new market and business opportunities. And there is outside opportunity for competitiveness and I will say Cleantech clusters.

Cleantech promises to be the next industrial revolution. As such, Cleantech is at center stage in all major government and recess institutions' agendas. Cities, states and regions all over the world are fighting and they are competing to make their cities the new hubs of science and technology. To repeat, Michael Porter was a guru in economy competitiveness, a schooler from Harvard Business School, and he argues in his book, 1998 book, Clusters and Competition, he said that clusters are the ingredient necessary for any regional community development.

All right. So it is in that context that the leadership of Orange County has decided to launch Cleantech as one of the major part of the economic

agenda for the next decades.

What is the purpose of the study? You know, it's three-fold. First of all, it will serve as a useful tool for all connect. This is general, for all connect quarters in the region. We're talking about you, all individuals, all of you who are here today, you know, groups or entities with a direct investment, involvement or interest to invest in clean technologies. And also it will serve as a source of data for companies who decide to invest in clean technologies. It will offer them a comprehensive blueprint to take advantage of this new economy and new vision. In turn, it will serve as a stepping stone toward future economic development for Metro Orlando, and this is what Mr. Lewis was talking about. This is very, very important for them because the study will provide them as the key input information base for any new leadership agenda for Cleantech as the driver for future wealth, creation and prosperity in the region.

The study methodology. The institute will use a very comprehensive research methodology that will include not only primary and secondary research, but we also are doing a survey. For instance, we will use -- okay. As sources, we will use existing Cleantech study reports and books. I don't know -- in the disks that we

received from the -- from Mr. Lewis, he has done a lot of research. You can see they have very, very great books as far as the Cleantech revolution, which is a great one that just came out and revised here. And, also, we have ministers that we have talked about from California. We have many, many great reports being done all over the countries, not only in the United States, but also overseas.

And, secondly, we intend to use information from major companies and networks like Cleantech Group, LLC, the Cleantech Network, and also from Clean Edge, Ernst and Young. Their websites are full of information that are being updated on a daily basis. And, also, we will use the research institute, science and business journals, newspapers and periodicals. And, finally, we intend to conduct interviews with Cleantech experts. Also, in the case of this region, we're planning to have a survey with major companies who are involved in Cleantech here in the Metro Orlando area.

So we are counting on your input in this process, and we think that, you know, everybody will benefit out of it. And, you know, as we said before, the symposium series definitely will play a major role in this process and we thank you in advance for your cooperation.

The timetable. The study will be implemented in

different phases. We have the research implementation that's been going on since the beginning and up to March, and the survey implementation, we just started it and we intend to finalize it this week and kick it in, you know, starting next week. We're going to start contacting all major companies around here and we are asking every single company or individual who wants to be contacted, please, after the symposium, you know, give her your coordinates. We would be more than happy to get an interview later. Also, the report and study outcome itself will be coming in March and we will share it with Orange County, and hopefully in April, we'll make a final presentation of the report data collection.

First of all, there's a combination of factors that will guide us -- you know, guide the type and scope of this study. First of all, we have to take into account the will and the wishes of Orange County and also the key uses of the companies, the government responsibilities, and that will be the assessment of any state or local policies and programs. And, finally, we understand there is research to be done from all private decision makers in Cleantech issues.

So the first type of information that will be in the study, first of all, we have to start with Cleantech as a new technology revolution. As you understand, as I

talked about it earlier, the book from Pernick and Wilder, they are two gurus in Cleantech from Clean Edge. They came out with this great, great book, and it's -- Cleantech is a new technology. And we also are going to talk about all the global trends and statistics. As we just saw here, there are many coming from different parts of the world and different sources, and we make sure we get you the most updated information. In terms of -- also, we will talk about the main drivers. In their book, Cleantech Revolution, these two authors mentioned six main drivers of Cleantech that they call sixes. It's caused capital competition, China, climate and consumers. So we will layout -- you know, briefly on each of them, we will explain why we believe that these six components are really driving Cleantech.

And also we will talk about Cleantech as an engine of growth because we cannot talk about Cleantech without talking about how it's bringing jobs and how it's creating economic growth in the region. So this is very, very important. And also Cleantech jobs, green jobs, will be a major part of it.

We also intend to talk about each major technological sector or industry. First, solar energy, wind power, biofuels and biomaterials, green buildings, personal transportation, utilities or smart grid, water

and mobile technologies. And what will be researched in each particular industry, in each of them, we want to talk about why it matters, why we need to talk about it, and also we talk about the overall trends and the challenges and opportunities that also exist, and we also talk about all the related Cleantech jobs and the major players. Here, we will try to introduce also the players in the region because this is how people can show more interest, because if they know in the region that something is starting already, so definitely it will help us out.

Cleantech clusters. As I said, Cleantech clusters are very, very important, so our intention will be to talk about all the existing clusters all over the country, talk about the initiatives that have been taking place, and, you know, again, talk about clusters and economic growth. And also we want to give some success stories. We're thinking about California as a state, because within California there are many clusters and we want to explain why -- you know, based on our research why we think they have been so successful. And then we're going to talk heavily about Metro Orlando. We're going to talk about all the assets. You know, why we think Metro Orlando can be the future -- one of the future leaders in Cleantech. We will talk about the

natural resources of Florida, we'll talk about all those organizations that are supporting Cleantech, the Cleantech industry here, and also all the organizations that have been engaged in making Cleantech a success, because we believe that partnerships are one key to any economic development success. So we talk about all the partnerships that exist already, like this series that is taking place here between the University and Orange County. We will also talk about all regional initiatives that are already existing. In terms of market analysis, we will also -- we will list all the major companies that are here and, you know, any companies that -- again, before you leave, please provide us with your information. We will contact you to get further information for the survey, because the purpose of this study is basically, you know, the survey is very -- would be a very important part of it, because so far we're just talking about, you know, all the details that exist out there, but unless we know for sure how companies that are investing or want to invest in Cleantech, how they feel about it, how, you know, they've been performing so far, if they have been successful, or maybe some have failed. So we want to know all about that and make it part of our recommendations.

Next, you know, for the survey, the reason for the survey will be laid out in detail. We talk about all the opportunities and challenges that exist, and we also talk about potential for growth, and before we talk about the potential for growth, we have to know all the assets, you know, what -- we have to know if there any investments -- you know, investors here. You know, we saw in here that these are existing and we want to know about those who want to invest and we want to know about those who have failed, as I said earlier, and we want to know about all the major industries. We will also provide an action plan with specific details for the for the -- for Orange County because it's good for them to have specific -- you know, specific recommendations. So this is what we're going to do.

And, finally, in the last, we want to emphasize in the role of symposium here we are asking every single one of you to collaborate with us, to give us all your valuable insights, because it will be a valuable part of the study.

Thank you very much.

UNKNOWN SPEAKER: Could you put your phone number back up, please?

MS. CHADWICK: I'll do it.

I would like to reiterate what Marielle already

mentioned, which is the role of all of you in this particular study that she's responsible for putting together for all of us. So in -- we haven't ironed out all the details yet, but in the next series 1 to 2 of these particular sessions, it's going to change from a passive format, which we're in right now where you hear from all of us, to an interactive format. And so that means we might be asking for you guys to actually provide some legitimate data based on your particular companies or your opinions or what not. So heads up. And so, please, keep coming, because start -- probably starting in the next one, we're going to transition into that format, and your input is invaluable.

With that, I'm going to turn the podium over to Jim Fenton. This is the guy with the tie. If you haven't -- he came in a tad late, so you may not have seen this, but it's probably in the introduction here. Jim is the director of the UCF Florida Solar Energy Center, which is over in the Titusville, Cocoa Beach area. He's been in that role since January of '05. He leads a staff of 140 folks in the research and development of energy technologies that are enhancing Florida's and the nation's economy, the environment, and it's focusing also on educating the public, students, and practitioners on the results of their research.

In addition to his duties as the director of FSEC, he leads a 12 member university and industry research team and a 19 million dollar Department of Energy research program to develop the next generation proton exchange membrane. That's in the fuel cell engine domain. I don't want to get into the batteries.

Prior to joining FSEC, he spent 20 years as a chemical engineer and professor at the University of Connecticut. His research activities in fuel cells, pollution prevention and sustainable energy are helping FSEC expand its nationally acclaimed research and education programs in hydrogen, alternative fuels, solar energy and buildings' energy efficiency. He's the author of more than 120 scientific publications and a number of book chapters, and he holds three patents.

With that, Dr. Jim Fenton. Thank you.

DR. FENTON: Let's see, new Bill Gates products. So thank you for that introduction, Kirstie.

I'm here to sort of talk today about opportunities. I'm going to give you some history as we move through this as well. The Florida Solar Energy Center was founded back in our first energy crisis. This was in the 1970's. At that time, we were concerned about the fact that we were importing a reasonable amount of oil. We're importing a lot more oil than we did back then.

And, as a result, there was an oil embargo and we implemented at that time automobile CAFE standards. That was when we implemented automobile CAFE standards. Today, we are about 23 miles per gallon average automobile now. The interesting thing since that period of time is the automobile has gone up -- the average automobile has gone up 800 pounds and it's doubled in its horsepower; i.e., we're all driving pickup trucks. Now, as you know, the price of fuel and everything else like that has changed. Some of the dynamics are changing. The interesting thing, though, is if you want to look at things like energy, we tend to get focused on the manufacture of energy, the production of energy. I'm going to try to get you more focused on the efficient use of it. The best energy is one you don't use. Okay? So efficiency really is where we should be looking at. It's not quite as sexy as you might think. That's where we need to go. Then, of course, I'd like to -- being in Florida Solar Energy Center -- move towards energy generation from a real perspective, but I'll always tell you to go with efficiency first. And usually that's the most cost effective thing to do as well.

Okay. I've listed the program areas we have. Kirstie mentioned that we have 140 employees. I'd like

to put this in a perspective the business world loves. I have an 8 million dollar payroll. State gives me 2 and a half million dollars. Most of my employees are on soft money. They don't win DOE department grants, they're unemployed. Simple. Okay? We're good at what we do; all right, because of that reason.

Solar, of course, is our name and we were founded, as I said, 30 years ago. And at that time, we were founded to test and certify all solar hot water heaters sold in the state of Florida. This would be safe for domestic hot water generation, right, as well as a solar pool hot water heater. All right. And we still carry out that mission. We actually test and certify all solar hot water sales in the whole United States. We do that via a national program. In Florida, if you buy a solar hot water heater, it will have an FSEC stamp on it.

We've grown into the photovoltaics area as well. I have about 10 people on the professional side in solar hot water, 10 people in the photovoltaic area. We test and certify all PV sold in the state of Florida as well as all the systems that are sold in the state of Florida.

Now, my biggest group is the buildings area. We have 40 professionals in high performance buildings.

We're the only university at UCF that leads a DOE sponsored Building America program. I didn't even know UCF existed five years ago. I'm sure you've been told by now that we're the sixth largest university in the United States. So we're a well kept secret. Florida Solar Energy Center and its activities are a relatively well kept secret as well. So of these 40 employees working on performance buildings, I have two architects working full time on Habitat for Humanity homes throughout the whole United States. I'm making those homes energy efficient. Okay. So our least expensive homes we can make energy efficient. This isn't just for the wealthy. All right. In the photovoltaic area, we're one of two universities that lead photovoltaic applications throughout the whole United States. We have a nice resource at the Florida Solar Energy Center.

The testing and certification in the solar thermal area continues today. In the hydrogen alternative fuels and fuel cell area, I have 20 employees tied into that. We actually run a DOE program, so I actually wear a Department of Energy hat, and the membrane will be used in our automobile fuel cells in the future. So we have that activity going on. Then we also have about five people in the K through 12 education arena. We do a lot of training. We run a banner center on behalf of work

force in Florida on the training of photovoltaic installers. Okay. This is being done in conjunction with about 10 community colleges and so forth. So I think you are going to find that the opportunities in the alternative energy areas are rising in efficiency as well in that. The opportunities are in the jobs, and I will get into that a little bit later on, and then the demonstrations of these technologies, of course, are important.

Let me give you a background. We've used the word, markets, okay, and a lot of the cases alternative energy is always going to be alternative until it's cheaper. Okay? So when we want to talk about solar, wind, biofuels, and some things like this, you have to put this in perspective as to what the current technology is costing everybody. Now, everybody in this room knows the price of a gallon of gasoline. Everybody in this room probably knows where the cheapest gasoline is. How many times did you drive by a price sign today on the way to this symposium? It's a marketing marvel the fact that gasoline -- you're bombarded with the price of gasoline. Occasionally you might go by a liquor store and see a price of Budweiser. Other than that, the price of gasoline bombards you all over the place. Most Americans don't know the price of electricity, nor do

they even know what the units are. As Kirstie pointed out to you, a gallon of gasoline has no energy merits with it. It's just a volume. And, yes, ethanol has less energy per volume than gasoline does per miles per gallon. So your miles per hour will go down, but you pay for it based on gallons. Electricity is actually paid for using energy units. It's a kilowatt hour. As you can see from this slide I've got here, it may be difficult to see the prices, but Florida down there in the lower right is at 11.2 cents a kilowatt hour. We can call that 12 cents if you want. You can see on the top above the map here -- do I have a pointer up here? Okay. If you look above the map there, you can see that the United States in 2007 had an average price of 10.64 cents. Now, I'd like you to look at the states that surround Florida. They're all cheaper. Okay? I'd like you to look at West Virginia. West Virginia is probably somewhere around 6.6 cents. Then let's go over and look at Utah. Okay? That's 8.17 cents. Okay? So when people talk about it's going to cost too much doing all this kind of stuff, you are already paying for it, folks. The state of Florida made a decision that we wanted to use cleaner burning natural gas to provide our electricity. Okay? So you pay more than those southern states that are just above us to the north. They're

paying less. They're burning more coal. Utah burns exclusively coal. Now, if you look up at Washington and Oregon, yeah, cheap hydroelectric. Okay? You look at Texas, 12.41 cents. You look at the state that I came from, most expensive outside of Hawaii on here, 18.6 cents. Okay. West Virginia, which isn't too far away, is paying less than half for the cost of electricity. So where do you suppose the markets for alternative technologies are in the states that already have the cheapest electricity around? I.e., it isn't broken, why do we have to fix it. So I can explain why the Boston area has all the Clean technology areas. I can explain why California does. San Diego, which was mentioned earlier, has time of use rate electricity. This is where you pay for electricity as a function of time, because, as you might expect, at around 2 o'clock, say, in Florida, that's when everybody's got all their air conditioners turned on and we're making electricity. Well, the utilities have to provide us with electricity. Okay? Right. They turn on their most expensive power generators around 2 o'clock. They hope to turn them off as fast as they probably can. Well, time of use rate in San Diego is 32 cents a kilowatt. 32 cents. That's their time of use rate. I.e., we're paying a fortune for electricity. We'd better do something about it.

Now, when I'm talking about alternative energy technologies, alternatives won't be alternatives when they're cheaper. Now, I didn't make the map here, but I have the map, and if there is an opportunity later, I can put it back up, that actually shows renewable energy portfolio standards, okay, for different states, and they're colored in green, and you can imagine that those people that are paying the most for electricity tend to have far more renewable energy going on than people that have less. It has nothing to do with your resources. Now, Utah is blessed. So is West Virginia, depending how you look at it, in that the coal they burn is their coal. So you might argue environmentally maybe that's not the right thing to do, but they purchase their own coal. So when they pay for electricity, all the money stays home. Florida spends 55 billion dollars a year on fossil fuels. This is our transportation fuels, this is our coal, this is our natural gas to make electricity, and so forth. 55 billion dollars a year. Ballpark, half of that leaves the state. Think about that. That's a lot of money. I think the economists in the crowd will tell me that, yeah, roughly, if you keep the money here, it actually develops, what, two to three times the value of the actual dollars you keep here. So roughly 55 billion, 27 billion is money that we ship out

of the state. Multiply by 2 to 3, that's a lot of money. So it is important that we're clean, okay? I'm more concerned about keeping the wealth here. Now, if you don't use energy at all, even if it's Florida's wonderful sun or biomass, okay, you keep the wealth here, too, because what are you doing? You're making an up front capital purchase. You own it. It's yours. So if the value goes up, you keep it. When you buy energy, you just consume it. It just -- it's gone. All right. Some things to think about. The interesting thing then here is that if you look at cost of electricity I've got on this map, you can see here that Connecticut is up there at 18.6 cents. Okay. So you know if the cost of photovoltaics on your roof top is less than 18.6 cents, okay, without subsidies or anything else like that you're putting in, okay. So the sunshine state, as an example, loses to the garden state like you wouldn't believe. It's cheaper to put PV on your roof, okay, in New Jersey, okay, today. The state of New Jersey has a portfolio stamp. By the way, the public service commission here in the state of Florida just announced that it agreed with the governor that we will have a 20 percent RPS by the year 2020. Hopefully, the state Congress will pass that. So our goal here in Florida is to have a 20 percent renewable. Many of these other

states that have these renewable portfolio standards also have what we call a public benefit fund. Okay? You could argue it's a tax. Yes, it's a tax on your electric bill that helps offset the cost. It provides subsidy. Let me give you an example with the state of California. The state of California spends 550 million dollars a year on rebates to its citizens to buy down the cost of photovoltaics or solar thermal hot water on their roofs. 550 million. Now, California has twice the population the state of Florida does, so if we want a million solar roofs like California, this is easy. Just come up with two 275 million bucks a year. That's $1.50 a month on your electric bill. That's what that cost is. So I'm going to take away a beer from every one of you once a month, and if you're smart, you steal your wife's. Okay? That's what it comes down to. Now, we were told, of course, that $1.50 a month was too much money. Many of you who are in Progress Energy territory or in Florida Power and Light territory, you are going to be paying 6 to $9 a month to purchase a nuclear power plant which won't turn on for 10 years. Okay? I'm not saying those are good or bad things, but if Florida wants to have a market and generate opportunities here in the state, we've gone forward. We're coming up with 20 percent renewable portfolio standard. We have to

have a public benefit fund on the money. That's what will drive these markets. The cost of electricity has a bearing. As it turns out, at a 5 percent inflation rate -- by the way, that's very conservative, though it's hard to say what's gone on the last six months as to what the prices of energy are -- but roughly at a 5 percent inflation rate, the nation's average in 2015 will be 16 cents a kilowatt. In 2015, okay, the cost of photovoltaics on your roof without subsidies will be 16 cents a kilowatt hour. So who would have dreamed that I would have told you that in 2015, photovoltaics will be cheaper than electricity out of the wall. That's where we're going. The opportunities are there.

I did want to sell more of you of the efficiency thing, and the interesting thing about efficiency is let's look at where the sales of electricity occurred throughout the United States, and then let's look where they occurred in Florida. And you can see here that in Florida, okay, 51 percent of the electricity is used in your home. So if I could magically make every single one of your homes a zero energy home, how would we do that. We'd put a lot of money into your home. Make it more energy efficient. You get to keep the wealth. Or we could take money, invest in a big power plant. So you can own a tax payer power plant or you can own a

more valuable house. Okay? And guess what? We keep all the money in the state of Florida. It's simple. Every house in the state of Florida should be a zero energy home. Just to give you a flavor, Florida Power and Light generates 50 percent of all electricity in the state of Florida. 51 percent of the electricity is all used in your home. Guess what, you don't have to pay the bills. Make some upfront capital investments. Okay? Roughly, we can go ahead and improve our homes by 30 percent at a levelized cost of about 5 cents a kilowatt hour. Remember, you're already paying 11.2 out of the wall. So this is just an issue about financing. okay? If you think about it this way, almost all of you have a mortgage. Okay? Now, the interesting thing is when we talk about energy efficiency, everybody comes to me, what's the payback, what's the payback. When you put that granite countertop in your kitchen, did you ask what the payback was? When you upped up for leather seats, did you ask what the payback was? Do you remember when TV was free? You are all paying 60 bucks a month for TV now, aren't you? I can't get a buck, 50 out of you to go ahead and put PV panels all over your roof. Think about it. It's crazy what we're doing. Okay? The key here is that right now in Florida typically we were building about 190,000 homes a year.

Okay? Dropped down substantially on that. Okay? And we were all building them to the minimum code. What's that mean? A barely legal building. Okay? That's what it really means. All right? Furthermore, a builder builds you a building, gives you the biggest square foot you want. The builder doesn't operate it, you do. So you want to operate your building more energy efficiently. And, see, I think that's where the opportunities are. That's where the real growths are is in the efficiency area and the markets for that.

Okay. Let's talk about this American home. In Florida, by the way, we have 8 million homes. Okay? As I said, we can do about a 30 percent average efficiency on all these things and drive those down. We run into troubles with the paybacks, okay? But if you can imagine, if we had a scheme where somebody would come into your house, okay, do an energy efficiency measure with it, all right, come up with all the cost effective things. Basically give a loan to your power meter, okay? And if the loan -- say it's a 30 year loan to the meter. It's not to you, it's to the meter, okay? The state of Florida owns the house, okay? You're just an occupant, okay? Why do I say that? If you look down here at the punch line on this particular slide, in the year 2050, two-thirds of all buildings already exist

today. So, yes, I want to build new stuff more efficient, but we've got to go in and retrofit our existing buildings and our existing homes. Okay? Now, you come back to me, what's the payback? Six years? That's too long. Eight years? That's too long. Well, magically if I give you a 30 year mortgage to the meter, okay, and the pay back is less than 30 years, okay, your first month, you win because your cost of your electricity will go down, okay? Yes, your principal and interest will go up, but your cost of electricity will go down. And if it's a 30 year mortgage, you financed it over 30 years, and the payback is less than 30 years, your first month you made money on the deal. And you're not paying for fossil fuels and you're keeping all the wealth in the state of Florida. This is easy. It's all about financing, okay, and desire.

Now, we've got to provide incentives to get people moving, but you can see here then that buildings use quite a bit of our primary energy use as well. In Florida, the bulk of that is electricity. Of course, we have heating issues and things like that in the northeast. I'll give you a flavor of it. This is a plot of the per capita electricity use. And if you paid attention to our new Department of Secretary of Energy's presentations -- I've been using this plot longer than

he has, okay, but he uses this same plot -- but I'm going to give you a Florida flavor to it. I've added the state of Florida onto this plot as well. As you can see, the electricity used per person in the '60's up to the oil embargo in 1973, pretty much the whole nation was moving at a slope. After the Arab oil embargo, we slowed down, but California went flat. They actually went flat. Now, there's this misnomer that you got to use a lot of energy to generate economic wealth and some things like this. Well, California has proved that's not true. Their productivity and so forth is very good, but the electricity per person has gone flat. Now, let's slide all the way out to give you an economic context of what that means in Florida. Okay? Today, if we use 12 cents a kilowatt hour, that's 5,000 kilowatt hours a year per person. Okay? That's what the difference is between that sort of purple dot and the yellow dot. All right. So then 5,000 times 12 cents is $600. We have 18 million people in Florida. We spend 10 billion dollars a year extra on electricity than a person in California because our houses are built of crap and they've gone ahead and implemented good buildings. It's simple. Okay? We can fix this stuff. Okay? Lot of opportunities there.

Okay. Now, let's talk about energy as far as

transportation goes. Think about it. You're enamored with liquid fuel. That's what it's all about. Magically you think you have to have liquid fuel in your car. Okay. Personally, I think every car in the future is going to be electric. Okay? Furthermore, why do you have to have the engine in the car in the first place? Why not just electrify all the highways. Okay? By the way, the real estate savings would pay for it alone. If you think about it, if you're driving on a big huge freeway, and albeit, right before I got here today, I was moving very slow, but if you could drive 70 miles an hour, okay, you're supposed to have a car length for every 10 miles an hour you go. So that means if you're going 70 miles an hour, there is room for seven cars between you and the car in front of you. That's because you need the stopping distance, everything else like that. So if you could magically rack and pack all these cars, put them in a single lane, I go from seven lanes down to one lane. If you've electrified them, I don't have car accidents because I've saved all that and done all this. That's a lot of real estate. Might pay for it all. This is a picture of an oil tanker going into hurricane Isabella. By the way, it turned, the hurricane. They were able to turn the hurricane. But in a way, this is kind of the situation, if you want to

think about it, that we're getting ourselves into.

Now, I'm a firm believer in climate change, and climate change is very important, and I believe that the climate change issue is also one that's very concerned that we have. I happen to live 5.72 feet above sea level. It's amazing to me that they actually get that to the decimal point. So, obviously, as far as that's concerned, I've been inundated with the water. It's not exactly the greatest thing in the world. Keep in mind, as the sea level rises a meter, Florida's just sand. Our aquifers, our sources of water, okay, will be impregnated by sea water. Just sort of goes right to it. We're not even talking about that problem. So I do agree water is a big one. Now, the other interesting thing is, how do you clean water up? You put a lot of energy in. Oops, we buy that from somewhere else, too. So these are some interesting things to think about.

Personally, peak oil is where the problem really is. Now, I put this plot here for you. This is a plot of the annual oil production and billions of barrels as a function of time. Now, I chose this particular peak oil plot for two reasons. One, it was published in 1998. Okay? And, two the peak was in 2005. Now, I'll explain to you about what this means. So this actually shows then, if you look along this sort of orange jagged

line here, as times goes on from the '30's into the '80's, you can see the oil embargo in '73, we actually went down. We started using less oil. There is a lot of argument about peak oil as to exactly when the peak will occur. Okay. Everybody agrees that they know the amount of total oil we have on the planet. The argument is how efficiently can you get it out, at what cost can you get it out, and how much can you get it out. That's where all the disagreements are. But I chose this peak here because it was in 2005. Now, what we failed to do in 1998 was to think about China and India. Okay. That was into the long hair. So actually put a star up there for the actual 2005 energy use. Okay. Which is substantially above where the peak was before. So if you were to redraw this supply curve, if you will, on here, sort of keeping the area under the curve kind of conserved, we can argue about it. So when our -- I guess officially our former president announced three years ago that a child born today will be driving a hydrogen powered car -- and, by the way, since I work on fuel cells, I hope we do make those investments and we pull that off, okay -- I can tell you this, a child born then won't be driving a gasoline powered car because there won't be any left. The lowest value anything has is this energy value. If you can do anything with it,

don't burn it. By the way, this peak oil stuff, that's what we make all our plastics with, that's what we make our pharmaceuticals with. It's feed stock material as well. Something to think about.

Had some interesting things going on. Okay. The prices of everything seem to be jumping all over the place. The interesting thing is you should be aware of the fact that electricity -- I mentioned to you already, that it varies all over the United States, and that dictates markets and so on and so forth. Now, we're being very proactive. We're getting ahead of the curve here in Florida. And I do honestly believe that energy efficiency and alternative energy, it's all about jobs as well as solving some of our energy problems and keeping some of the wealth in this state, and these can be cost effective things over time that actually you make money doing all this, so we should do it. But you got to keep in mind, it's all relative to the cost. In our case, we ship all our money out of the state of Florida when we purchase any of this fossil fuel stuff. But things you should be aware of, the cost of electricity since after World War II has been relatively constant. Okay. Things really started changing in 1998. You'll notice that all three of these curves, the upper one is retail gasoline prices, and this is a --

you know, a week old now, okay, so I've got it pretty much up to date. And then, likewise, with the price of a barrel of oil. And then at the bottom, I show you natural gas prices. You'll notice here that in 1998, everything sort of started going up. Okay? All right. When I first came to Florida, Governor Bush was all concerned about changing the pie. We were concerned about the fact that we're building all these natural gas plants and the price of natural gas was going through the roof. So, my gosh, the citizens of Florida would be cut into that. Our current governor right now wants to color in the state. I didn't give him my map with all the green states. Florida isn't green yet. So sounds like pretty soon we'll color it in green. We'll accomplish that. That's good. But you go to look at these prices. You'll notice here that natural gas prices spike around a little bit more. Okay. We'll comment to you that the sun's free. Now, can we make efficient cars? Can we do all this kind of stuff? Well, this is a plot that I unfortunately have a tough time keeping up to date, too, okay, because the prices of gasoline change all over the place and, of course, it's not so easy for me to get the prices from all these different countries. But if you look over on the left there, I've got miles per gallon as a function of time,

and as I mentioned in the United States, CAFE numbers, that's the blue around there, around the 23, okay? They've been pretty much that same value since the late '70's. I've got a cute story. I like to make this comment to any new 16 year old, 17 year old. You know, unlike your parents, my parents all gave them the keys to the car. Jim, anytime you want to drive, no problem. Oh, by the way, fill it up. So I'd go ahead and get around on my hands and knees, crawl around to the back of the car, look at my license plate, determine whether it ended in an odd or even number, which then gave me the privilege of sitting in line for two hours to purchase gasoline. Now, kids are smart. They know exactly how old I am. That was 1973, so I was 16. Do the math. But the interesting thing is that we can be more efficient. Most people that pay twice as much, okay, for a gallon of gasoline then have cars that are twice as efficient. No surprise. Okay. Now, I got one for you. The Brits. Okay. Do I have the UK on here? Yeah. Okay. So at the time we were paying 3.73, the United Kingdom was paying $8.20. So you say, those poor English. Okay. They're paying twice as much for a gallon of gasoline. A gallon of gasoline doesn't mean anything. It's just a easy thing for you to pay. Okay? Now, the interesting thing is you pay twice as much for

gasoline per year than they do. Now who do you feel sorry for. Because you buy more than twice as much. Okay? Now, we can argue also the actual price for a gallon of gasoline pretty much is the same throughout the world. It's the taxes that are the difference. Okay. So people like the United Kingdom have been collecting twice as much taxes as we have for the last four years. Okay. What have they been doing with it? Well, being Americans, we assume they pissed away half of it. I ask you, what did they do with the other half then? They have electric trains. What do we have? Asphalt and cement. Where does asphalt come from? Oil. Oops. Okay. And yet we're going to shovel more asphalt projects around. Wait a minute. Or we could make them out of cement. Wait a minute. Cement takes a lot of energy, too. Okay. Why we can't put rails down? I have no clue. Here's another one for you. 18.8 cents on a gallon of gasoline is used to build our highways. Okay. It's a fixed tax. That's how much money we use to build the highways. Everytime you take your credit card and stick it into that little machine, the bank gets 3 cents on a dollar. So when we get to the $6 a gallon, the banks will be collecting 18 cents for the transaction and we'll use 18.8 cents for the highway. So I ask the question, geez, are you more upset about

Exxon or are you more upset about the banks? Oh, wait a minute. The banks are all out of business. I used to tell everybody that fuel cells are great. Whatever came out of General Motors two weeks later came out of the Department of Energy. Oops. What happens if General Motors is bankrupt. I may be unemployed. Interesting things to think about. Okay. Efficiency is where it is for transportation. I want to talk about this. This is our millions per barrel per day of oil. So you can see here I've got our business as usual case there. It's interesting. Every plot in the world looks like a function of time. Whatever you are doing goes up. Okay? And the whole goal in life should be, wait a minute, how do I get it not to go up and get it to flatten up. Told you about electricity per use. It's true with gasoline. Now, like I said, back in the '70's, we started importing. We got to the point where we were kind of, you know, importing 30 percent of our oil. Look at where we are today. And look if we continue on our path in 2030. Okay. Where do you think all the money's been going, folks? Okay. Now, what happens if we set up a goal that we want to go ahead and get off imported oil? Okay. So we went ahead and did a study about how we go ahead and do that. Okay. And, you know, I happen to be a republican, but drill, baby,

drill doesn't work, folks. Using the best, the absolute best scenarios for Anwar, getting other oil from off our coastlines, so on, so forth, you will notice that's at the bottom of my curve as I add it up there. And, furthermore, it doesn't even make up for the fact that our existing oil production has been dropping every year because the United States has exceeded its peak oil. So you can see here that those pretty colors that I have got down at the bottom don't even get me up to -- in 2030 up to the point where I was in 2007. Okay. So the increased ethanol, Anwar and OCS don't even make up for the fact that the existing Alaska oil, the Texas oil, the California oil we already get is actually going down every year. Doesn't even make it. If you look at the top, though, look what increased miles per gallon does. T-Bone Pickens for a while was telling everybody, invest in wind farms so we can use that natural gas to fuel our cars. So we did that. That's helped a little bit there. Okay. If you cut back on your vehicle's miles travelled, which, by the way, congrats, you guys did that. You guys stopped driving. Great. Okay. All I got to do is convince people that electricity is a sin, gasoline is a sin, and tax the bejeebers out of it. It gets the desired behavior. You stopped sitting. Now, let's use that money for some good stuff. Interesting

things to think of. The reality is you got to do a little bit of everything to pull it off. So we can get off of imported oil in 2027 by doing a little bit of all these things. There is the take home message. To give you an example of the success that we have at UCF, everybody's heard of Gatorade. Do you know what the No. 1 patent at UCF is? Okay. It's a ceiling fan. You can go buy one at Home Depot. By the way, UCF gets the proceeds from that. Okay. Helps keep some of my researchers alive. Well, they sold a million of these ceilings fans, and each one of these ceiling fans saves on average $20 a year in electricity. We save 20 million dollars a year on electricity from a simple little ceiling fan. Energy efficiency products and compliance and things are some nice markets to look into.

Let me give you another example. This is a house that was built in 1998 in Lakeland, Florida as part of Rick Strawbridge's development at the time. The house on the top there is a normal house. A normal control house that he might build at the development. The house in the lower right there with the white roof, and white roofs are really nice here in Florida because they reflect the sun, okay, it's got larger overhangs, shades the windows, so that prevents sunlight going directly

into the windows on that home as well. Better air conditioner, better insulation, so on, so forth. It's got the photovoltaic panels on as well. The large array there is facing directly south. There is another array that's sort of on the left of that picture that is picking up the peeking sun in the west. There's a solar hot water heater over to the lower right. To give you a flavor today, amortized -- and you can go on our website, by the way. We have all these little calculators, okay, that can tell you about what costs are and everything else like that. So that's www.fsec.ucf.edu. There's several other websites that you can get to off of that. My -- www.myfloridagreenbuilding.- something. I don't remember what it is. If you Google my Florida Green Building, it's another website. You can get to it off our site. It talks about all the efficiency things you can do in your homes. Everybody knows that compact fluorescent light bulbs is a smart thing to do. To cut to the chase on this, ballpark, if you put a compact fluorescent light bulb in, you save on your electricity use. Okay. That's important. For every buck you save on electricity for the consumption by the compact florescent light, you save $1.30 on not having to air condition your space. Okay. The use of the compact

florescent light bulb in Florida is more important because it's not heating up your house which you now have got to air condition that space. Okay. That's the bigger savings to us, okay, here in Florida. A better air conditioner, more efficient air conditioner is important. Ballpark, the house down in the lower right, it sold first, cost $40,000 more. Now, at the time, we don't know exactly what the most cost effective things were. Today, it's appraised at $80,000 more. How do I calculate payback on that? You don't. You haven't been. Wait a minute. This house is worth more. Oooh. Okay. Now, those poor appraisers have no clue how to appraise PV panels. So we've got other issues to deal with, too, but something to think about. Now, that standard home up at the top used 22,000 kilowatt hours. Okay. The photovoltaic, the zero energy home, 70 percent of it was just through energy savings. Okay? All right. And I put electricity cost savings in there. By adding the photovoltaics on to the roof, we were able to get it down to the point where the house only used 8 percent. Okay. So, you know, smartest thing to do in Florida, every home is a zero energy home. Now, we don't even grade our homes. You can go buy appliances, they have little gradings on them. I am hoping eventually that this standard -- this is a standard that

several of the building associations are working on. Basically, it's called the home energy rating index. Okay. And so, in this particular case, with this scale, a hundred here is listed as a new home built within 2006 codes. Okay. Zero energy home is down there at zero. Okay. And, roughly, the average home here in the state of Florida is somewhere up around 150. Okay. And so your home's graded. Okay? I want everybody to require that your home gets graded, okay? It's useful information. Right now, you've got to get a radon test for everybody. Why not get your home graded? Every time you do a transaction, we should do that. Then we should provide the homeowner with various cost effective ways to make his home more energy efficient. We've got to start grading our homes. We'll be doing that soon.

Solar hot water heating, solar hot water heaters. Here's some pictures for you. Photovoltaics. In Florida, in a lot of the cases photovoltaics are cost effective because you have to put transmission lines in. In the two Progress Energy nuclear power plants that we're talking about at 7 billion dollars apiece, you're going to spend 3 billion dollars for the wires. That's what you're going to do. It's a big huge, giant power plant. You've got to run wires all over the place, too. Okay. The neat thing about photovoltaics, you put it on

your roof. That's where the cheap real estate is, too. It's free. All right. The world's largest market for solar energy is in Germany. Germany has less of a solar resource than Alaska. It has nothing to do with the sun. Okay? It's called policy. It's called, do we want to drive the markets. Okay. I hinted to you that New Jersey outdoes the sunshine state. You can see here that New Jersey doesn't have the same solar resource as Florida does. There's another interesting thing you'll notice. In Arizona, New Mexico desert, that little part of California, so forth in there, yes, that's ballpark 100. Florida's 75. Okay. Now, the interesting thing, though, is it's not a solar resource. The issue is free real estate. To get the sun's energy, you need lots of area to collect it. So the reality is in a world where traditionally we make electricity and electric power companies build big power plants to do that, I can go ahead and use a lot of real estate in Arizona and New Mexico, out in the middle of nowhere, which is free, nobody cares about it, and put these big solar power plants out there. So that's what they do. And, by the way, they're cost effective. And, in fairness, Florida Power and Light owns most of them, the large ones that are out there. Florida Power and Light owns 45 percent of all the wind in the United States. Unfortunately,

none of those are in Florida, but they own them. In fairness, we are starting to put a solar thermal electric. This is where we take mirrors, generate steam, then run them through a steam turbine. We're starting to do that in Martin County, Florida as an augment into the existing steam turbine plants that FPL has. But the real issue is real estate. So power companies like big power plants. Where is the free real estate in Florida? It's on your roof top. It's on highway right-of-ways. It's on the Wal-Marts and so forth. How do I get it? So FPL, Progress, OUC in Orange County, okay, own the power plant on my roof. That's what we got to figure out how to do. Real estate on your roof is free. That's what the issue is. But it's big power plant to small power plant.

Give you a quick analogy here. Bear with me on this one. IBM invented the mainframe computer. Bunch of years later, they invented the PC. We know how to sell the mainframe computer, we're making lots of money on it, let's just keep doing this. Imagine if IBM said, the heck with the mainframe computer, we're going PC. They wouldn't just own the computer world, they'd own the world. And, by the way, IBM is one of the big investors in solar, by the way. It's interesting if you think about that. Okay? Well, all right, what was the

super computer way back when? A really big mainframe. Anybody know what a super computer is today? A bunch of network PC's. Think about it. It's the same way we're going to do energy. A bunch of network PC's. You know where the energy storage is going to be? Plug-in hybrid in your garage. Okay. We're going to go ahead and integrate your home and your car and the way you make electricity and energy efficiency all in one big system. Okay. And there is all those opportunities. Oh, I did leave this in here. Oh, such a deal. Okay. Florida isn't green. Okay. If I looked at this map in September of 2006, there would have been a lot less green all over the place. We were hoping to be the first in the east. I mean, in the south. North Carolina and Virginia beat us to it. But we're going to color our baby in green and we're going to have 20 percent. Okay. And all those little places that have the cute little sun there are states that have public benefit funds that actually promote solar and buy down the cost. Okay. We had 5 million dollars last year, and all those rebates expired, and it comes out of the general tax fund. Okay. And I will guarantee they probably won't have them again this year. Okay? Because, as you know, we're cutting budgets all over the place. We do need to put a public benefit fund in

place, but we're not even willing to tax cigarettes yet, so we got a ways to go. I'm hoping we'll pull that off someday.

Okay. The jobs are in the installation. Okay? Went to all the markets here, 20 percent portfolio, which we're going to pass pretty soon. People will arrive on our door step, okay, because you manufacture these things where the market is. There's a 20 percent market because by law there is. I guarantee they'll show up. Okay. The jobs really, though, are in the installation of these things, because they're going to put PV on your roof or solar thermal hot water on your -- it's all constant installation. Who are you putting back to work? All those unemployed construction workers that aren't building new homes. There's a lot of jobs. If you do this on a job per megawatt basis, it's a lot of job years. Okay? A lot of education and training. We actually bring in $800,000 a year in short course fees. Okay? I'm running PV installers workshops now twice a month. They're sold out in advance. And these people pay a thousand bucks for the week, the course, to do this. Okay? I'm sold out six months in advance. Three-quarters of the people are coming from outside the state of Florida. Okay? Rest of the United States gets it. We're getting there.

A lot of neat things with educational activities as well. The eighth graders actually in the state of Florida compete in the middle school science bowl. We hold it at our place. As part of that, there are car races. Okay? So I actually have kids racing solar powered cars. I have kids throughout the state of Florida competing in a national competition. We actually send eight teams. We have a competition on this on fuel cell powered toy cards. So when the president said, a kid born today -- previous president -- you know, 16 years from now will be driving solar powered cars, eighth graders in Florida already built them, folks. So as far as the future goes, I'm very optimistic we'll educate our strong work force here to get us through these problems we're dealing with today. Any questions?

MR. LEWIS: Jim, one of your main messages, I guess, is that if we don't change building policies and codes and establish things like public benefit funds, that we're going to be at a competitive disadvantage in terms of attracting Cleantech companies and jobs to Florida.

MR. FENTON: And I will tell you it's even a little bit different than that. Keep in mind, when we change the building code, that affects the new homes you build.

8.3 million, you do 100,000 a year on the new ones, isn't quick enough. By all means, let's fix the new building code. We've got to go in and have programs that makes it effective for the homeowners somehow, okay, to finance and go in and retrofit our existing homes. Okay? And so this is about financing, getting the audits in. I mean, you know, that guy, the poor homeowner that's giving up the beer? Okay, I want him to sit on his couch, eat his potatoes and watch football all the time, and magically the state of Florida somehow or other makes your house more valuable and lowers your electric bill. We've got to come up with a policy that does that. It's doable. It's called financing is what this really is.

MR. LEWIS: I think you're providing us with a lot of ammunition. I just want to say one thing before the break. When you ask questions of any of the speakers, please state your name and who you're with and go to the microphone so the transcriber can enter you in the court record.

MR. FENTON: I think the opportunity clearly that the solar -- I mean, I work at the Florida Solar Energy Center. I think the opportunities are here. I should announce because I think people aren't aware of this, but the Orange County Convention Center will have over a

megawatt of PV in the next couple of years. So the Orange County Convention Center is doing that for what reason? To book conventions, you got to be green. And the Orange County Convention Center is going to be able to say that we've got more PV than the San Francisco Marconi Center. And they made the decision to go ahead and put the PV up there -- it's going to cost them more than the electricity out of the wall -- because it's a marketing tool. People will book conventions because you are a green convention center. Other ways of looking at things.

MR. BRUDERLY: Jim, Dave Bruderly from Plain Power Energy Company in Gainesville and Wise Gas, Inc. You made the point of policy has to define the marketplace, and I think we're finally seeing in this county that market driven policies don't work if you don't have the right government -- or market economies don't work if you don't have the right government policies in place to shape the boundaries of those markets. You stressed efficiency as something that's important for this state in addition to cost, and I strongly agree with that, but I think that we need to have an exercise with the Florida legislature in adding one more criteria given the severity of the climate crisis that we seem to be bumbling into with business as usual, and that policy

performance criteria, in my judgment, would be emissions, greenhouse gas emissions. And if we start assigning values to everything that we do in our economy, whether it's grams of CO2 emissions per gallon of fuel that you buy, or grams of CO2 emissions or kilograms per kilowatt hour of electricity, if we can start putting those numbers out there on the marquis right next to the price, here's how much pollution you folks are making with your day-to-day buying decisions, then the markets will work. And I think Florida can be a leader in doing this. Second point, you mentioned policy in Germany. The City of Gainesville has just voted to authorize Gainesville Regional Utilities, a utility owned by the people, to implement a feed in tariff program to motivate distributed generation on roof tops with solar energy. And we're looking for investors who want to help local companies learn how to do that so that Sun Edison doesn't come here from California with their hundred million dollars venture capital and just blow us all away. So that's why I'm here today. Thank you.

MR. FENTON: Thanks. I do agree with you. As I tried to hint that, you know, a lot of electricity is used in your buildings, okay? And so it really is more of a local -- you know, what is it. Government's always

local or something, but -- effect, and so, yes, you know, regional utilities, municipal utilities, because they're made up of the citizens, will probably be leading in a lot of these activities than the independent owned and operated utilities. When you think about it, in fairness to Florida Power and Light, where does it want to put a wind turbine? Where it's the most cost effective place to put a wind turbine, which is in Texas. It's not in Florida. Your municipal utilities want to do what? Put the most cost effective thing in your area. Okay? The FPL model's fine. I'm not saying anything about it. But the goal really is at the local level. And in fairness to the regional utilities, municipals and co-ops are doing a lot of interesting things. A lot of them have programs already on the energy efficiency activities.

MR. BRUDERLY: What about the emissions, the emission standards?

MR. FENTON: Yeah. Now, cap and trade, when we're talking about CO2, I remind everybody that we had socks and knocks problems, okay, and the U.S. Government implemented effectively the same type of system we're talking about now where you can actually trade emissions credits. All right? See, the interesting thing about it is that you can put taxes on these things, you can

argue about all of them, but in the case of these pollutants we're talking about, they don't really know geographical boundaries, so I don't have to make everybody reduce the same amount. I need the air pollution to be reduced by X amount. Okay? So there are mechanisms. And the cap and trade scheme we're exploring here in the state of Florida, the Department of Environmental Protection has been tasked with implementing that, and we will be doing that. We've already joined sort of the reggie states, all the states up in New England that are paying a lot of money for electricity, they got together, they were concerned about all this. The reason they're not coal is because they already get the coal air pollution from the midwest, so they're a little bit ahead of us. But we will be putting a price on this. With truth in product labelling, I agree with your comment that you need to know how that is. If I had my choice, every product you buy out there would tell you how much water was used in the production of that product, it would tell you exactly how much energy was used in the production of that product, and it would tell you the total emissions used for that. I'd like to tell you a cute story on this one. It used to be, and now it's -- we're even doing better. The best thing to do is to reuse rather

than recycle. But when you used to go to the grocery store and they'd ask you plastic or paper, okay, if I asked you what was best for the environment, well, you might have different answers, by the way. If I asked you what you chose, plastic or paper, I like the plastic bags because I can grab the kitty litter, or I got to run up to my apartment, I can carry six bags here, whatever you chose. If I asked you what was better for the landfill, almost everybody would say that paper's probably better for the landfill. Plastic bags were by far and away better for the environment. Has nothing to do with what the material's made out of. I tricked you. Okay? Why is that? Well, it takes five trucks to deliver paper bags and one truck to deliver the plastic bags because they're so skinny and thin. So you stuff them in. They got to deliver them to the grocery store. It's the diesel emissions from the trucks delivering the bags that are by far and away the impact to the environment. Nothing to do with what the bags are made of. You got to be careful. When you look at these things on impact for the environment and cost, you got to do the true life cycle, the total big picture.

MR. LEWIS: Jim, one question. Unlike other states, Florida does not have automobile or vehicle inspections yearly. Other states do, and they test your

emissions. Should Florida establish an automobile inspection?

MR. FENTON: I don't think so. Okay? I would rather have us go ahead and say we'll provide -- we can't -- we can't set federal CAFE standards. California and the federal government is arguing about that. What I would like us to do is provide free air at every gas station. Okay? Because Obama was right on this one, folks. Improperly inflated tires cost us 4 percent of the total amount of oil we use in the United States. That's a lot. Make it easy for you to keep your tires inflated, rather than driving around, figuring how to inflate my tires. They used to do that for you, remember? Okay? So I think I'd rather work on programs like that. Or give you a big tax break, which I can do in Florida, too, if you buy a more fuel efficient vehicle. I'd rather go down that path.

You wanted to cut me off. Sorry.

MS. CHADWICK: I do, sorry. You are going to stick around, though?

MR. FENTON: Yes.

MS. CHADWICK: He's a wealth of information. Thank you. Sorry for running over. Obviously it was great information. We are going to take a break. I'm sure you are overdue. We unfortunately are behind,

obviously, so if you guys could maybe just keep it to 10 minutes max and then come back in so we can try to get out of here on time, that would be super. Thank you.

Oh, real quick, Tom Lands has -- raise your hand, Tom. Tom is the president and founder of AquaFiber, our sponsor. So he's now here. He wasn't here when we announced his company earlier. He does a lot of water stuff, so you need to check with him about that.

(A break was taken from 10:04 a.m. until 10:15 a.m.)

MS. CHADWICK: Okay. The next two presenters are folks that are coming in from some of the large companies here in our region that do quite a bit of work in the Cleantech sector, and we're really grateful for both of these gentlemen taking time out of their busy mornings to be here.

First, we have Frank Bevc. He's with Siemens Energy. Frank is currently the director, technology policy -- I'm sorry, he's the director of the technology policy and research programs at Siemens Energy. He's responsible for the evaluation, selection and development of advanced energy products and technologies that serve the global energy markets. Current product initiatives cover a diverse field, including carbon capture technologies, smart grid distribution systems,

advanced electric powered transmission components, advance turbo machinery systems, renewable energy systems, and supporting technologies for all of the above. With that, Mr. Frank Bevc.

MR. BEVC: Thank you, Kirstie. Jim is always a very hard act to follow, so I certainly will not have his degree of enthusiasm, even though I'm pretty familiar with the topic that I have. I'd like to thank both the Orange County folks and UCF folks for inviting me out today to talk a little bit about Siemens and about Cleantech.

Siemens, or Westinghouse, I should say, has been a part of Orange County since 1980 when about 20 people moved into some rented office space at 1011 East Colonial. And then about a year later, there are about 150 of them that moved out to an abandoned K-Mart at 6655 East Colonial. And then in 1983, a little over 25 years ago, we moved to our current campus out across the street from UCF. So we have partnered with UCF and been a part of Central Florida in the energy and power generation fields for 25 years now, and Orlando is home to all of us and we enjoy being here.

What I would like to try to talk about in the next hopefully 20, 25 minutes is to give you a little overview of Siemens and Siemens here in Orlando, to talk

about Siemens' global portfolio of Cleantech and environmentally focused products and businesses, to talk specifically about the success story that the wind energy business has been to Siemens and to the Orlando facility for Siemens, then to talk really about three approaches for Cleantech growth through research in university partnerships and through venture capital funds and funding from venture capital firms, and then, lastly, to talk a little bit on federal funding and what's in the stimulus package that was proposed last week and will be making the press and headlines for the next month or so. So with that, basically Siemens is one of the largest electrical, electronics companies in the world in Euros, which means you multiply by 1.3, 1.4, which means we're about a hundred billion dollar a year company with 427,000 employees worldwide, spend about 3.8 billion on R&D each year. That's in Euros.

Here in the U.S., we're also a major company. We're about a -- in terms of dollars, about a 18, 19 billion dollar a year company with almost 70,000 employees, and we do about a third of our global research here in the U.S. So Siemens, although it's headquartered in Germany, is very much a U.S. company. And, of course, the rest of the areas are a big part of that.

Siemens is organized into three sectors. Working from the bottom industry, health care and energy, industry includes the smart Siemens building technologies, which talks an awful lot about the energy buildings that Jim had mentioned. I'm not quite sure why they are. People make the claim that we process a hundred percent of the mail in the United States. Sometimes that's not always a good thing to admit to. The other claim we make is that we've handled baggage at a hundred of the largest airports here in the U.S. That's another thing that probably isn't too good to admit to either and claim as a challenge, but, nevertheless, we're part of the infrastructure of both the U.S. and major economies throughout the world. In healthcare, everything from hearing aids to CAT scan systems and pet scan systems. Medical information technology, we're the largest processor of medical IT in the United States, which means, of course, what's being talked about in Washington these days is of great interest to Siemens. And then the part of Siemens that I come from, the energy segment, is, as a global segment, about a 23 billion dollar a year kind of business. We have almost 84,000 employees worldwide. It's a profitable business. About 25 percent of our sales come from the Americas. Most of that, over 20

percent, from the United States. You can see that we're split fairly evenly otherwise between Asia and Europe for most of our sales. Germany, being Siemens' home country, is no longer the major market for our company. Basically, it's one of the smaller -- well, it's the largest European market, but it's certainly not the dominant market for Siemens sales these days. Our energy sector's divided into six divisions. Basically, we cover everything from oil and gas down in the ground relative to the technologies needed to bring it up out of the ground to the switches and distribution devices that basically allow the lights to be turned on in big buildings like this. So an oil and gas segment, a fossil power generation segment, renewable energy, services to take care of all of those, the big heavy wires, transmission group, and the smaller distribution level activities where smart grid kind of things are developed. Siemens has about 5,000 employees in Florida. We have over a half -- thankfully, we have over about a half a billion a year in payroll here in Florida, we have 59 locations and about a million, 1.2 million square feet worth of facility space, most of that white collar office space. We do have communications manufacturing facilities and even some turbine service manufacturing facilities down in Boca

and some other locations. But almost all of our efforts here in Florida are intellectual property based rather than heavy manufacture, and basically Florida Power and Light, Progress Energy, and GRU and others are good customers of ours, and we sell about 1.3 billion worth of energy related products here in Florida for Florida customers.

As I said, we've been out by UCF in our quadrangle campus for 25 years now. We have about 3,000, or over 3,000 employees there. Again, a white collar environment with engineering, marketing, project management, procurement, business functions. And it was until from 1980 through 1998, Westinghouse, and Siemens acquired Westinghouse prior generation back in 1998. So for the past 10 years, we've been Siemens Westinghouse, and now Siemens. And most of the growth in the past two or three years has really come from environmentally driven businesses, environmental clean up and renewables, wind in particular. If you look at Siemens overall, we have an environmental portfolio that is really second to none. Our biggest competitor, of course, is General Electric. And you can talk about dancing elephants and ecomagination and all that kind of stuff, but when it comes to sales and products and that kind of stuff, over a quarter -- over 22 billion dollars

worth of sales globally each year is in environmental products that drive down the amount of CO2 that's emitted globally. In the next three years, or two years now I guess it is, we expect that to grow by another 10 billion dollars. So it's like one of the fastest growing segments of our company globally. And we are part of the group of companies in the United States, U.S. Cap, that is pushing for a climate change policy that includes cap and trade or some measure of putting a price on the cost of carbon. And, hence, some of the products that help do that is improving the efficiency of existing fossil power plants, certainly renewables, and then transmission and distribution efforts. Siemens' water technology is also part of our industry group and is into filtration and water purification. Mobility in terms of those electric rails and mass transit systems we're talking about, as well as Ossram Sylvania. Sylvania light bulbs is a Siemens company. Here in Orlando, the primary things that I think we can claim as the cleanest of the clean energy, those renewable kind of things, is, first of all, driving up the -- is driving up the efficiency of existing fossil power plants. Basically, those old dirty coal plants up in West Virginia and the midwest and that kind of stuff have moved from about a 28 percent average efficiency to

a 35 percent average efficiency over the past 15 years or so, in part by upgrades and modernizations and those kinds of things. And every increase in -- percentage increase in efficiency, of course, means fewer carbon dioxide emissions. Certainly, there has been a lot of clean up of sulfur and noxious emissions and those kind of things, and part of that is due to the secondary, and that is through air pollution control on major power plants. We acquired a company called Wheelabrator Pollution Control a few years ago and another company, New Jersey company, called Advance Boiler Technologies, and both of those deal with cleaning up coal fired power plants. So that's a current mission and one of our current high growth kinds of markets. The future way of, in part, cleaning up coal from a end use, from a clean use capability totally is basically, instead of burning it, to gasify it. Gasification allows coal to be used as a feedstock, as a petroleum substitute in all those plastics and other applications. They also allow the total capture of CO2 through a coal -- from a coal fuel powered plant and, hence, the early start up, if you will, in technologies relative to cleaner use of coal as a source through gasification. And, of course, the renewable success story is wind, but also our energy sector because of the amount of waste energy that exists

in heat and power plants is a natural for our desalinization business. So we are the largest provider of desalinization systems coming out of power plants, coupled with power plants, primarily in the Middle East these days, but also it's a fairly big market for us. You can see that the ramp up in both our environmental systems and service business and our wind power business is -- has been a relatively recent kind of thing over the past three or four years. And you'll notice that there are numbers on the sales axis, but you can tell that there's a doubling and tripling and quadrupling of sales over a two and three year kind of time period in terms of actually hundreds of millions of dollars. So both of those are our fastest growing areas. Hence, when asked about Cleantech and to talk about environmental kinds of things, that's a natural message for us. One that we're very happy to do anytime we can. Wind energy is not the traditional view of -- not necessarily the traditional view that's held of a small wind turbine out on a farm. Mainly, they're used to pump water. Those systems still exist, but technology has moved. Technology and composites and control systems and new types of generators and those kinds of things have allowed a ramp up in the size of individual wind turbines and, indeed, wind projects. So Jim

mentioned that the best winds are out in west Texas and up in the plains and up in Wisconsin, Minnesota. That's right. And, indeed, the size of wind turbines -- my favorite graphic is the -- we're now 20 747's high in terms of wind turbine size on the big systems. Those allow us to drive down the price of wind such that we're nearing the point where the subsidies aren't going to be needed anymore. The typical wind farm order that we have these days is several hundred megawatts in size, so it's essentially at the same scale as the traditional coal fired power plant was maybe 20 or 30 years ago. So wind energy is becoming a much larger part of America's energy generation resources, and certainly growing in size relative to the size of the product. The -- Florida's best wind resources are offshore. That is, the winds are much higher along the coast or off -- just off the coast than they are on shore, and that is the area that we would see market development for wind energy in Florida. The longest suffering U.S. wind project off of Cape Cod finally got its environmental impact report published last week and looks to be moving forward, and you can tell from the bottom half here that the Europeans, Denmark and Germany in particular, have moved offshore with projects that are very significant in size. There are also some very large mega wind

projects. T-Bone Pickens is doing a 2,000 megawatt, the size of a nuclear power plant, wind project in west Texas. Two others, one in Minnesota, another one in offshore London, are the kinds of things that will move wind energy from small scale kind of systems to get up to that 20 percent of the total electricity generation, or a much larger percentage of the electricity generation. And, basically, with Siemens Energy, we've added about 700 new jobs in wind energy alone in the past since -- in the past two years since January of '07. About a hundred here in Orlando, and, again, the engineering and projects kind of people, we've opened a new factory in Fort Madison. Unfortunately, when you're shipping airplane size components around, transportation becomes a very big part of the decision, and the Mississippi, and being halfway between where the two largest markets are sort of drive where those big factories are going to be located for wind energy. So there is hope certainly for component factories like the one in Ohio that put -- President Obama visited a couple days ago, but the big component places are going to be where the transportation systems are the best. Basically, we're -- we've initially sized that factory for 500 megawatts. That's about the size of -- that's the size of the Stanton plant out by the airport, and

we've doubled that capacity in the past year, 2008, such that we can now put out wind blades and wind turbines that can meet the market demand.

Of course, Siemens -- there are other renewables besides wind energy. Solar thermal is also at the hundreds of megawatts size power plants at this point in time, and the solar thermal mirrors and focused thermal systems, and driving steam turbines has traditionally been a big business for us. We are -- in the United States, have 100 percent market share with all of the turbo machinery and solar thermal things. I doubt we'll be able to maintain that record, but certainly we know very much about doing solar thermal power plant development. And also we are a packager and installer of grid scale solar PV systems. So, hence, we're a customer for the PV manufacturers more so than a manufacturer of PV equipment ourselves.

Moving quickly into some of the things that sort of drive Cleantech ventures and Cleantech business growth, and the first is innovation. And that is -- you know, Siemens, I think, prides itself on being a technology provider, and increasingly, companies like us and like GE and like MHI, use a open innovation concept for where our technology comes from. So we partner with universities and start up businesses and individual

inventors and we do a lot of research and development on our own. About 650 million the last year in R&D in energy. Plenty of engineers, lots of patent activity, lots of patent activity applications, as well as patent maintained. But a good deal of where our technology is coming from is from university research partnerships. UCF being just across the street has been our longest, and in the U.S. is our most active university partner, and certainly work with MIT and Carnegie Mellon and Penn State and Purdue, and not too far away, the University of Florida and Florida State and a few others. But we have more of our employees out here in Orlando. Over 400 of them are UCF alumni, so we have sort of a natural base for people who know people, and partnerships and technology development kinds of things come from that. The three examples, the Siemens Energy Center basically is a turbo machinery research and development center that was just dedicated last fall, in part with the equipment and some cash donated from Siemens and the building facility located on the UCF campus, and about 25 of our engineers are actively engaged in doing research with faculty and students out there. Also last fall, the Florida Center for Advanced Aero Propulsion, one of the state's centers of excellence, had its kick off meeting, and Siemens is pleased to provide at least

moral support up to today for that center, a consortium of UCF, Florida State, the University of Florida, and Embry Riddle -- I think that's all of them -- to again look at turbo machinery technologies and aero propulsion technologies that support both NASA's mission and the mission of rotating equipment suppliers like us and like MHI.

And, lastly, we're one of the investor advisor board members of the Nano Tech Center over at UCF. Applaud both that center and work that's being done at UCF in voltonics and technologies that sort of feeds into our portfolio of what's needed.

The other approach that sort of encourages Cleantech ventures and start up companies is through venture capital, and Siemens basically, as a corporation, has its own venture capital business that is run as a standalone venture capital firm that's responsible for the kind of financials that any other venture capital firm is. That is, it looks to make money in the long term. Basically, it's celebrating 10 years of existence this year. We have about a billion dollars, 700 million Euros, capital under management, investments in over a hundred companies, and in 40 venture capital funds, we have a fund of funds manager investing in funds as well as individual companies.

And, basically, we try to look for synergies between what our core businesses are, and as broad as Siemens is, that's a pretty wide spectrum, and what a new venture brings to the world in terms of innovation. In the U.S., our venture capital offices are located in Boston and Palo Alto. It's a relatively small group, only 30 people, but basically with 30 billion dollars for investment looking for ideas. And you see the website address there, siemensventurecapital.com. We're not particularly creative when it comes to communications, but that website will provide more information as well as the specific individuals that are responsible for technologies and the right person to try to get a message to if you're interested in pursuing any venture capital kind of things.

And the last two slides really are not Siemens information, but really the draft stimulus package that the House Appropriations Committee released last week. And, basically, that package in great detail is available at house.gov, www.house.gov. That's the House of Representatives website under the Appropriations Committee, and there's a 14 page summary which is pretty much copied in two pages here. It's the highlights. As well as the massive 258 page bill that spells out in gory details, at least in draft form, what is hoped to

be provided, and a 76 page report on logic behind the 258 page bill. Sometimes the report is far more confusing than the bill itself is, so, whatever. But basically what I wanted to do was highlight that now is a particularly good time to be pursuing energy technologies relative to funding or the funding opportunities that will exist coming out of the federal government. Out of the 825 billion dollar stimulus package, 54 million is Cleantech investment, and 54 -- did I say million -- billion is cleantech investment. And a couple things in terms of energy systems, in terms of industrial energy efficiency, in terms of blocking grants to local governments and for developing -- both developing and deploying energy efficiency technologies, in terms of smart grid improvements, Gainesville GRU in implementing a feeding tariff is one part of what's necessary to achieve the highest gains in energy efficiency, electricity efficiency, improvements and reductions in consumption, because with that feeding tariff, you are encouraging people to make an economic decision on how to generate the realm of electricity or the time of day to use their electricity, and that's sort of essential to achieving the hasty reductions that are needed. In addition to that, the grants and loans to businesses relative to implementation of energy

efficiency, so -- and then one area in particular that may be of interest to start up companies that have technologies focused on energy is, of the 1 point -- science, basically, the alumni administration hopes to or is saying that they want to double the amount of funding for research and development. One piece of that is a 1.9 billion dollar line item for basic science research, and included in that is a 400 million dollar line item that establishes or focuses the Advanced Research Projects Agency, Energy Department E, into stimulating high risk, high payoff technology ventures and technology investments that is, for both big companies like Siemens and certainly for innovative companies and start ups, a fund that will certainly exceed what's available in the SBIR kind of funding regime for moving from those first ideas, proof of principal kind of stuff, into implementation. That will be administered very much like DARPA, which is the Defense Advanced Research Projects Agency, and certainly will have, you know, competitive submittals and proposals and grants and all that other kind of stuff. But for energy innovation in particular, that's a new pool of money that certainly should not be overlooked. There is also a host of tax credits for us. What is important if you're building in the wind energy industry

is the production tax credit which, until the American Recovery and Reinvestment Act, had been renewed on an annual basis. Well, if we're going to put in a factory and build wind turbines, that's a two year construction cycle for putting in the factory and another three years worth of order cycle kind of stuff for sort of trying to pin down the demands that our customers will have for wind turbines. So a three year as a minimum, and hopefully longer than that five year kind of extension on the tax credit that comes from producing wind energy is important, not so much at Siemens but to our customers, because it allows them to make those longer term kind of decisions. The Europeans, instead of going the route of a tax credit, do what GRU did in Gainesville for the first time. They put in a feeding tariff. That basically means that for a period of time, and I believe it's 20 years, a rate of -- a sales rate for electricity is guaranteed, and, hence, if you're a investment banker or certainly a business manager of a company that wants to generate electricity, you have no uncertainty relative to what your source of revenue is going to be. So certainly feeding tariffs are better than production tax credits, but at least both are in the right direction with regard to encouraging renewables and those kind of things. So technology

partnerships, venture capital funding, and federal funding through both the stimulus and through the normal federal channels, I think, are three ways that we see as Cleantech being encouraged throughout the U.S. and certainly here in Orange County.

So, with that, I'll wrap up, and in 20 minutes, and certainly be happy to take any questions.

UNIDENTIFIED SPEAKER: What was the website for the draft bill?

MR. BEVC: Yes. The website for the House of Representatives is www.house.gov, and you'll see a link to the Appropriations Committee that will take you to, I'm sure, the biggest headline on the page, which is the stimulus bill.

MR. LEWIS: The 100 jobs in wind energy that are here in Orlando, what kind of jobs are those?

MR. BEVC: Those are all -- well, they're all professional, engineering people and --

MR. LEWIS: Design?

MR. BEVC: Yes, design. There are some purchasing managers and procurement people, but pretty much it's -- you know, it's high tech, white collar jobs.

MR. LEWIS: If you are looking at the Siemens venture funds, I mean, would you encourage some of our Cleantech start ups that have received some annual

funding to look at the Siemens venture funds as a possibility?

MR. BEVC: Certainly. The -- other than the name Siemens in front of it, it is like any other venture capital company. It's interested in investing in ventures that show promise. The two things that are different are, first of all, that it is focused typically on products that compliment Siemens' existing businesses. And, again, everything from hearing aids to gigantic wind turbines and that kind of stuff. So it's a very broad spectrum. And, secondly, our tolerance because it's part of a -- you know, a hundred billion dollars a year company is a little bit longer in terms of the payoffs that are in our --

MR. LEWIS: Is there a preference for companies and communities where Siemens has a presence?

MR. BEVC: No, I don't think I can say that. I think basically it's what the innovator's bringing to the party. That's of most importance. And where they are situated in their particular market. You know, their market opportunities.

MR. LEWIS: It's an opportunity.

MR. BEVC: Sure.

UNIDENTIFIED SPEAKER: I can't quite hear the question, so if I'm repeating, I apologize, but as far

as women and minority owned businesses, are there special opportunities for those types of businesses in this environment?

MR. BEVC: I guess, yes, there are. Let me repeat the question first since, as you said, it's very difficult to hear the question. And I think it was, are there opportunities for women and minority owned businesses in general. In terms of venture capital, I think it's another criteria, but I wouldn't say that there is really any particular preference. Certainly, Siemens here in Orlando is sort of like a United Nations relative to our makeup of employees and staff and those kind of things. I think typically we are towards the high end of the list in Orlando relative to good places for family members to work and that kind of stuff. We certainly encourage women and minority owned businesses to, let's say, try to supply to our company relative to sourcing and things like that.

Any other questions?

MS. CHADWICK: I'm going to move on. Frank will be here afterwards if anybody wants to chat.

Okay. Next up, we have Jim Williams with Mitsubishi Power Systems America. Mr. Williams is a vice present responsible for the service, repair and manufacturing operations of the power generation service

division of Mitsubishi Power Systems headquartered here in Central Florida. His role is that of operational oversight of the field service, repair and manufacturing product lines for all Mitsubishi turbine generator equipment throughout the western hemisphere. With that, Mr. Williams.

MR. WILLIAMS: All right. Thank you, Kirstie.

Mitsubishi. Most of you, when you hear that word, you probably think of, what, automobiles, plasma screens, whatever. Mitsu actually means three, bishi means diamonds. That's the logo, three diamonds, and it's actually used by about 40 companies worldwide. They each have their own balance sheet, so each of them is autonomous, if you would. A few of us will collaborate, but Mitsubishi Power Systems America, we're part of a larger segment called Mitsubishi Heavy Industries, MHI. Some of you have heard of that. Apologize for my voice, by the way. A little too much motorcycle riding in cold weather. But lots better than folks up north have it right now.

MHI is pretty diverse. We started a ship building corporation about a hundred years ago, a little over that. Today, we're about 32 billion dollars in sales revenue annually worldwide. Many segments of us still continue with ship building, continue with

transportation, the heavy structures, bridges and so forth, as well as aerospace support and power generation. Power generation is the segment that we are a wholly owned subsidiary of. In our power generation segment, we design and manufacture and service most of the components that we've talked about today, including the coal fired boilers that we've talked about. Nuclear, both primary and secondary site components, the steam turbine generators, much of the equipment that goes along with those power plants, and including the installation of those in many parts of the world. And as the market has changed globally, we've expanded our product line. We have in this business segment for us about 5,000 employees in our R&D group. They're seeking to both improve the existing products that we offer and develop other new ones, such as the renewable ones that we'll talk about in a few minutes. As a result also, we've already mentioned what's going on in Asia and India. There's a lot of growth in those areas. We are still, you know, selling, manufacturing and improving the design on the coal fired boilers, for example, but we don't see much of that market here in this hemisphere. So much of that manufacturing space we've converted to wind. In fact, when I started eight years ago, the boiler facility there is a good segment of what

I toured eight years ago, I toured last spring, has already been converted over to wind turbine cell assembly. In fact, we anticipate that by 2012 about 30 percent of our portfolio will then be renewables. So that's a big change for us, but we're trying to keep up with what we believe the global market's going to be driving.

In the United States, Mitsubishi Power Systems Americas, we are a wholly owned subsidiary of MHI. I first met John about 2001. I think there were eight of us. So we're up to about 600 actually here in Orlando now and about a thousand here in the U.S. We're responsible for the sales, the service, the maintaining of our customers' fleet here in this hemisphere. To give an idea, I've got a team in Nova Scotia working today, poor guys, and I got a team in South America. So we pretty much cover this hemisphere, although the lion's share of our work and service of our products is in the United States and Mexico. That goes from not just the conventional fired boiler turbine generators, but we do have geothermal units, we have hydro units, we have a fairly large market of gas turbines, and then we also support many of the renewables that we'll be talking about here in a minute.

I'm responsible for the facility in Orlando. Like

to invite you all to come visit us anytime. We'll talk about the PV cells we'll be putting on top of that. Like Jim said, that surface area is free to me. I got all that service area, and just like in your home, I can reduce my five megawatts of usage in the summertime, three megawatts in the wintertime. Even though it's a small chunk of that, same benefit to me, cost effective production of our product.

UNIDENTIFIED SPEAKER: Is that the Orlando Central Park?

MR. WILLIAMS: It's Orlando Central Park. The headquarters is located in Lake Mary. That's where our financial group is, our projects group, our legal team. We've got about 115 people there, I think, and the remainder of us here in Orlando and Orlando Central Park. And we've built out that second facility now. We dedicated it last summer, so that site's pretty much built out. We've got a little bit more room. We're actually looking at some other types of generation we might put there so we can take advantage of the opportunity to lower that bill. 13 cents per kilowatt hour we've got to.

We do have some other facilities in the United States. We have a joint venture with Vientech in Juarez, and like was mentioned earlier, the biggest

issue you've got with the wind turbines is transportation. These things, the rotor diameter of these things are a football field. The towers, you start looking at things that are in hundreds of meters, or nineties of meters, the transportation is an issue. So you want to have to be in a position that you manufacture and prepare those near where the source is going to be. We are also looking at sites to have the tower manufacturing done there in the central portion of the United States. And just like we were talking earlier, you know, Mr. Pickens is looking at sections of land out there that's required. If you start looking at a thousand megawatts or more, a lot of property out there. It's pretty easy to get to there in Texas if you're starting out nearby. Not as easy to get to if you're in British Columbia, for example. So we're looking at a site in the central states for that.

We do have our sales offices, and actually because of the majority of our renewable products for wind turbines is the west coast, our headquarters for our renewables is in New Port Beach. That's where the support team for the installation, the supply chain, which, the biggest part of this for anybody is the supply chain for the procurement team and all, is out there, as well as the service team located.

I think all of us realize that where we're at today, I think about 50 percent of our power is currently generated by not just fossil fuels, coal. And we need to have a transition to get to where we're at to where we want to be. There's a number of ways to get there, and we offer some of those products, but it's not going to happen overnight. A lot of folks have heard about, you know, IGCC's, coal gasification, integrated gasification products, and we do have one that's been operating in Japan since about 2007. It's a great product. Basically eliminates the CO2 emissions, so it takes you from that boiler turbine generator to a much cleaner operation. But what's it produce. Now you've captured the CO2, what do you do with that. Most of us have heard there is some projects even here in Florida that have been -- that have been considered, but until there's a viable way to sequester that carbon, it's probably not going to happen overnight. It's not going to happen next year. I think it will happen, but, you know, you go to symposiums for other segments of the power industry, I was talking to some folks today. You got American Nuclear Society, you got other coal generation societies. You go to those and you see proposed solutions that look much like the infrastructure for our natural gas pipelines. I don't

see that happening overnight for a long time. So once that's developed, I think these products will come around. It's very efficient and it permits us to utilize that resource for a while, but I don't see that happening for awhile. And we offer that, we do have that as a product that we discuss globally, but we don't have any here in the United States as yet that someone's come up to purchase.

The second aspect of that is I think also most of us realize that, unfortunately, back in the '70's and '80's, most of the steal mill iron works production in this country went away. Especially the large ones. And it's coming back. It's trying to come back, and it needs to come back. That drives a lot of this industry, and if we think we've got some issues with the fuel consumption globally, we need to look at the steel consumption, so forth, to go global in China and India. With that, there is an opportunity now to use a blast furnace gas that is a by-product. That product not only helps their process be more efficient, but it's being utilized to again make a very cost effective method for generating power. That takes that technology down 22 percent to get you to the next step cleaner. Probably won't get you all the way there, but it's a step in the right direction. This is being considered. We've been

utilizing it globally for a number of years. We do have a few customers that are considering they start up their mill again applying this technology up in the Great Lake states.

We do have a solid oxide fuel cell and it is a product that we have a micro turbine attached to in 2006. It's -- the opportunity here is it gives you about a 50 percent efficiency right off the bat. You think about how these other products, it took us awhile to get there, that's a good starting point. We have a model that we're putting in place to get us up to about a 275 kilowatt model. That's still very small, but it's a product that we've gotten that we're working with at this time.

Let's talk about the renewables. Again, I think I mentioned that we anticipate 30 percent of our portfolio in this market to be in this market by 2012. We sold our first wind turbine here in the United States in the '80's, and as we've already heard, most of those farms are out west. But they continue to grow and we've been very successful in that that was our largest growing product line the last two years. These wind turbines give us an opportunity for our current land base turbines, about 2.4 megawatts, and most of those cells are assembled in Japan, and the blades and the towers

here in the U.S. We hope to be assembling those as cells, but just like we talked earlier with the economic situation in the last quarter, we've got not only rate tariff issues, now we've got to look at the folks that are investing in this. I hope that it continues on because right now that's been one issue is that the sovereignty of the investors that we've got. Even though this is still a good investment, we've got some concern about some of those investors being able to live through this market with their other investments. So that's something to be looking at. This economy's going to drive not just this product, but all these folks that have multiple investments around, they're going to be watching this for a while, and we've seen, like everyone else, not necessarily a slow down, but they're much less aggressive than they were. This used to be a product that, if you had it, you could sell it. Now it's a product that folks are being a little less aggressive with. And still a very good 2.4 megawatts is ours on the land base, and as we've already said, this is -- the 2.4 megawatt one is about a football field in diameter, and by 2012, that's probably the only product we'll be selling here in the United States. The one megawatts have been going very well, but, again, the larger fields are probably going to be a little bit smaller, and they

can be smaller with two and a half megawatts, but with our experience with both the ship building and the super structures and bridge structures, the five megawatt offshore looks to be the next opportunity for us. Europe's already had it. We've already talked about the folks in the North Sea and all that applies those. There is an opportunity to have these offshore, and the five megawatt gives us a little bit of complexity that we can put the product and, again, have that perhaps even manufactured here in the southeast.

Talked to a number of folks today already about PV's when we came in, and I will mention in a minute, we will be putting those on our facility here later this year. But we're seeing a move away from the crystalline to the thin film. The thin film is what we will be putting on, this product, at our facility, and if the market continues to go as it should, it's probably the next product we will integrate in the manufacture here in the U.S. Thin film is more cost effective. It gives us a better efficient product, and it's turned around pretty well for us. So hopefully by the end of this year, we will have about 200 kilowatts on our facility. Where have we put the thin film? Again, already been mentioned. Germany was the first place outside of Japan. Greece, Italy and Spain. So there's an

opportunity there because we've already discussed why were those the first locations for those. It's the policy. It's a benefit to do that. It's not going to be easy for the first guys to get through that and start looking at return on investment. You've got to get creative, but if you've got something helping you with that, it's going to happen fairly quickly. That's the first ones we've had in operation were actually in Germany. Our facility here in Orlando Central Park is probably getting actually a little better than 200 kilowatts. Again, in summertime, at the control facility, I've got 550 people manufacturing. We've got vacuum presses, we have robots. We use about five megawatts in the summertime. That may sound like a very small piece, but it's a start. And it's a start just like we've talked about green, we incorporate lead compliance, green -- I will have, we hope we will have electric powered fork trucks as soon as they're completed by our Mitsubishi works for that also. So every little piece helps us with our cost. The intention is to have this operational by this time next year. And, again, that's our first step at this facility. Then we'll look at expanding. We have another 100,000 square foot of roof on the other building. See how that one goes.

Haven't talked much about it today, but if you think about it, here in Florida as well as many of these locations, solar's great during the day. The wind -- most of the places that we need the wind turbines, the wind is maybe a little stronger at night. The energy storage and the battery storage is going to be critical to this mix as we go forward. We've got both the stationary cell and then a cell for the vehicles. And, in fact, in Japan already, they're utilizing these cells in prototype cars and buses for transportation. We know that the trains have already been electrified for a long time. This is important because it gives us an opportunity to utilize renewables 24 hours a day. It's also going to be very important as we look at what changes to the demand. You know, this is going to be something that folks are plugging their cars in at night. If it's managed properly, it's either going to create a real hassle or it's going to be an opportunity for us to utilize that to help out the overall energy system and grid as we go through. So we do have products that we're testing for that. We've got several of them in California and Texas right now, the stationary. And pretty much like you'd expect for the car, the package is about the size of a small gas can, if you would, packaged together for that.

I mentioned that most of the Mitsubishi corporations are autonomous. Well, actually MHI and Mitsubishi Automotive are -- or Mitsubishi Automotive does have MHI as a partial owner for this reason. The development has been going on for a few years. If you've ever been to Japan, it's one of the best international trips you'll ever make. There will be electric cars there. There is no doubt they're going to be in that mode pretty quick. They're going to have to.

So what's the future energy network going to look like? It's not going to be cutting a switch on and off and getting completely there with all the renewables we're talking about, but there's a lot we can do to improve the efficiency and improve the existing systems, replace them, perhaps, with some IGCC's, improve them with some very high efficiency cycle utilization, use the renewable energies and the storage of that, as well as when we start moving into the batteries for the vehicles for the trains and for storage units at your home and at offices and businesses to help with the system that we've heard a little bit about, but now the whole grid idea is going to be a whole another discussion that we didn't hear a lot about during the election. The bill has it in there already. Folks realize that that's a big key to this that we have to

address.

Well, to give you a look in at some of our strategic meetings, not only is the CO2 emissions, you know, the right thing to do, it's going to be the law. I mean, we see that coming. It's going to be the law. And carbon capture, it has to happen for any of these IGCC's or others to be effective. If there is not a way to sequester that, then what are you going to do. You've created another issue that actually builds up fairly quickly. Generation technology, it's going to be a mix. We haven't talked about it today, but if you look at the other -- Japan, if you look at Europe, the other countries in the world, nuclear's going to be in that mix, I think. I think it has to be. And it's probably not going to happen in seven years. Some of us grew up in the '70's and '80's building that. I hope it happens in 10. I think it's more like 12 or 15, but it'll be in that mix, because if it's not in that mix, we're talking about gigawatts of power, not kilowatts. So it's a long way to go. But the renewables play a big piece in that.

Grid stabilization. I think we'll hear a lot more about that in the very near future. That's a key piece no matter what the mix of generation technology is. Fossil fuels are finite. We've seen a number of charts

mention that today, not only from a actual resource, but is it financially appropriate to go after some of these. We're going to hit that probably in our children's lifetime, some of these. You are exactly right. So there needs to be a move to get away from that necessity now, be it as efficient as possible, find a way to find alternative forms to supplement that generation. And tax credits and subsidies, you know, you got to be profitable to be able to get a benefit from the tax credit. There's a lot of concern with some of these businesses right now that they're going to be able to do that overall. So we have to find a way to get that, and I think there is an opportunity there for this to be a very strong growth in the very near future.

Here in Florida, we may as well be an island if you look at it. You say, you know, look at the grid, the way we have to bring our resources in here. There is an opportunity for us if we do go green and grow this the right way to be a leader. But either way, it's going to be a higher kilowatt per hour if we're not careful and we'll just be behind the curve.

Pretty good.

MS. CHADWICK: You rock.

MR. WILLIAMS: I promised her I'd do that. Any questions? Not that I can answer them, but I brought

someone with me that might be able to.

Any questions?

MR. LEWIS: Jim, is most of the Cleantech that happens here in Orlando just through increasing maintenance efficiencies and upgrades to existing power plants?

MR. WILLIAMS: We do sell and support all the wind turbines out of here in Orlando. The design and manufacture is done overseas, but the installation and the maintenance of those are done out of here. At the factory that we run here in Orlando, we are -- probably 95 percent of that product, the hardware that goes through manufacturing, is for the high efficiency gas turbines at the combined cycles plants, and like we've already mentioned, that's a choice that's been made. That's our primary source here in Florida for power generation. The solar is going to be headquartered out of here. In fact, the project leader is in Lake Mary for the installation of our facility, so the sale and project of that, we're still in discussions where that manufacturing would be. As far as the batteries, that's entirely in the R&D group, still in Japan, although the combination of that would be led out of the sales group in Lake Mary.

MR. LEWIS: We'd like to work with you to get the

manufacturing here.

MR. WILLIAMS: I know you would. You've been -- I know. I've -- like I said, I think seven or eight of us came down here and John -- and, actually, he's not here, Mark Owenstein. In fact, Mark Owenstein, I met him my first week at work. I went and enrolled my kids at school and Mrs. Owenstein was his elementary school teacher. Went over and enrolled my daughter at the high school and Mrs. Owenstein's mom was there. I thought it was kind of like, you know, the Kennedys or something. What is this family doing here.

So anything else?

Yes.

MR. SNAITH: And this could go to any three of our speakers. The amount of money that's being laid out in these early versions of this stimulus bill as far as the grid's concerned, I mean, is the appropriation -- are the amounts sufficient enough to do what we need to do to the grid given its age and the problems that exist?

MR. WILLIAMS: We probably got -- I can give you my opinion, but I doubt it. That's just my opinion, but these two guys over here are more versed than me. The good news is one of the first ones around. The bad news is one of the first ones around. And we've patched things up, but I doubt it. You guys can comment on

that.

MR. FENTON: Just as I mentioned, for 7 billion dollars for a nuclear power plant, we're going to spend 3 billion dollars for the wires, okay? So that just gives you the context that we're at. The wires cost a lot of money.

MR. WILLIAMS: But it's a start. I mean, we haven't heard much near the attention that it got. I mean, T-Bone Pickens didn't have a commercial about the grid. You know, he came on talking about sections of land. So it's getting attention. So that's a good start. I mean, it's like the 200 kilowatts of PV's on our -- it's a start. You know, it's not going to make -- I got another 4 and three-quarters megawatts to go, but it's a start. So we got to take little steps and get moving on it.

MR. BRUDERLY: T-Bone Pickens is about the only guy in the gas industry that's talking about changing the paradigm, and you guys are in gasification business. If you're going to decarbonize fossil fuels, you can only do that where you have geology that allows you to do carbon sequestration. So what about integrating the natural gas pipeline infrastructure into this smart grid so that you have an integrated energy system that will go to zero energy carbon carriers in the long term and

get a plan in place, a policy analysis in place, to see if that is the way we want to go. If we're going to spend 3 billion dollars of public money on a smart grid, would we not also want to look at the natural gas pipeline infrastructure and see if you can put hydrogen in that pipeline and ship us clean energy rather than carbon?

MR. WILLIAMS: Right. You got a great point there. That's exactly it is that the attention -- the carbon can be captured. What do you do with it? And I don't see the attention being given yet to where that process is going to be. The alternative to go with that probably will be getting more attention as it comes up now, but right now, I don't have an answer for that.

UNIDENTIFIED SPEAKER: You showed a slide of a gasification plant in Japan, and what I'm wondering is, are you sequestering CO2 there?

MR. WILLIAMS: Yes, they are, and, no, I have no earthly idea what they're doing with all of it. I should find out, but I don't know. But, yes, they are.

MS. CHADWICK: I want everybody to look at that there clock. It says 11:15. That's the time we're supposed to end. I want to thank everybody for coming out today again. As was mentioned earlier, our next symposium is on February 18th. It will require

participation from you next time, and so this time I hope you enjoyed the cupcakes. Next time, you are going to be part of the process.

John, do you have any other comments?

MR. LEWIS: No. Just thank you all so much for coming today and coming to the first symposium, and hope you all mark February the 18th on your calendars for the third symposium, and with any luck we'll have the director of the San Diego Cleantech Initiative here with us to share with everyone the Cleantech story, the San Diego Cleantech story, what we can learn from them.

One thing I do want to mention is that when I held up the Cleantech study from San Diego and mentioned that other communities are doing these Cleantech studies, we're a step behind, but I think Orlando has demonstrated in the past that sometimes we start a step behind but we end up a couple steps ahead. About eight years or so ago, the Central Florida Technology Incubator was just a fledgling start up. In 2004, it was the No. 1 incubator in the United States by the National Incubator Administration. There is an advisory board council that was developed by the Small Business Development Center here after we started that, after the downturn of the economy following the September 11, 2001. Other communities, Cleveland, for example,

already had advisory board councils. By the mid 2000's, our advisory board council program was selected as the No. 1 program in the world, business development program in the world, by the International Economic Development Council. When we started, some of you may remember the Angelo studies. He's a consultant out of Austin. And Orange County, the City of Orlando, and the EEC worked together to develop a high technology strategy. We didn't -- high tech was not really an integral part of our economic development strategy at that time. In 2008, Fast Company magazine identified Orlando as one of the 12 best places in the world for innovation. So we can do this. Don't read too much into that when I hold up all these other things that other communities are doing and get the impression that we're not going to be able to catch up, because I think we can, especially with all of you participating in this.

So thanks for coming today.

MS. CHADWICK: Thank you very much. See you guys next month.

(Symposium ended at 11:18 a.m.)

CERTIFICATE OF REPORTER

STATE OF FLORIDA
COUNTY OF ORANGE

I, Leslie Richmond, Registered Professional Reporter, certify that I was authorized to and did stenographically report the foregoing proceedings, and that the foregoing transcript, including 114 pages, is a true and complete record of my stenographic notes.

Dated this 7th day of February, 2009.

_____
Leslie Richmond, RPR and
Notary Public

(This signature is valid only if signed in blue ink.)