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**ORANGE COUNTY**

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**CLEANTECH SYMPOSIUM SERIES**

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SECOND CLEANTECH SYMPOSIUM

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Date: January 21, 2009

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Time: 8:00 a.m. - 11:15 a.m.

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Location: UCF Executive Development  
Center  
36 West Pine Street  
Orlando, Florida

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Reported by: Leslie Richmond, RPR

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



**Sponsored by:**

## **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**

## 1 P R O C E E D I N G S

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

6 Good morning and welcome to our second Cleantech  
7 symposium. Our first symposium was held on November the  
8 5th, the day after a long election day. I stayed up  
9 until 3 o'clock in the morning or a little later than  
10 that myself that night. Today is our second symposium  
11 and it's the day after a very long inaugural day. We've  
12 got to stop meeting like this. Our next symposium is  
13 February the 18th, and I looked in Google and I couldn't  
14 see anything exceptional happening on February the 17th  
15 or 18th. I think 18th is Gambia National Day and so I  
16 don't think we'll lose too many people from that, but by  
17 February the 18th, I think we'll be back on a schedule  
18 that is a little more in sync with everyone else's  
19 schedule.

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

25             Thank you very much and it's my pleasure to

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

13           MS. CHADWICK: Thanks, John.

14           MR. LEWIS: Thank you very much.

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

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

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

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

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

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

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

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

20 2009 was a year of transition that the group  
21 expects, you know, this year to also be depressed. No  
22 surprise, I'm sure. Everything else is in the same  
23 boat. But in the long run, the drivers that are driving  
24 the Cleantech focus and investment will remain intact  
25 over the course of many years, and so, therefore, the

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

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

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

1       Cleantech, feels fairly strongly that solar is  
2       experiencing a bubble. And that's real important for us  
3       to pay attention to because of where these VC dollars  
4       are with respect to again economic development. These  
5       early stage companies are often the drivers. Most of  
6       the dollars that did get invested last year were in thin  
7       film PV, which is up 315 percent from 2007. You can see  
8       the big jump there. The second highest category was  
9       concentrated solar, which sounds like it was huge with  
10      672 percent, but it had a tiny base to start from.  
11      We've seen a couple of those companies coming through  
12      both the Winter Park Angels and the venture lab. So  
13      even here in Central Florida, there's a couple of  
14      companies in the concentrated solar space that we're  
15      aware of. But, as I mentioned, the reason these numbers  
16      are so skewed towards solar is because there is these  
17      huge mega rounds of mezzanine and later stage funding  
18      going through which are kind of distorting the numbers,  
19      because if you look at the seed stage dollars, they're  
20      very consistent every year. They're not increasing. So  
21      there is not new early stage investment increases going  
22      on in solar, only later stage. So that's a sign that  
23      that particular market is maturing, and from an  
24      innovation perspective, we may want to start looking,  
25      you know, at some of the other categories.

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

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



1 as well. And to, you know, point out the difference,  
2 this was the second largest category. There was only  
3 one deal over a hundred million dollars in this domain  
4 in the top 10 deals done last year. And No. 10 was at  
5 31 million, which is still a large, you know, nice  
6 mezzanine round, but it's a much more rational number  
7 than what we saw in solar.

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

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

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

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

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

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

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

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

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

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

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

5 MR. LEWIS: Any questions of Kirstie?

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

8 Cool. We'll keep it on time.

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

12 MR. SNAITH: Competitiveness. It happens to  
13 everybody.

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

1           With that, back to Sean Snaith.

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

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

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

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

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

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



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

12 Cleantech promises to be the next industrial  
13 revolution. As such, Cleantech is at center stage in  
14 all major government and recess institutions' agendas.  
15 Cities, states and regions all over the world are  
16 fighting and they are competing to make their cities the  
17 new hubs of science and technology. To repeat, Michael  
18 Porter was a guru in economy competitiveness, a schooler  
19 from Harvard Business School, and he argues in his book,  
20 1998 book, Clusters and Competition, he said that  
21 clusters are the ingredient necessary for any regional  
22 community development.

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

1 agenda for the next decades.

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

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

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

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

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

25 The timetable. The study will be implemented in

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

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

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

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

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

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

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

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

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

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

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

21                 Thank you very much.

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

24                 MS. CHADWICK: I'll do it.

25                 I would like to reiterate what Marielle already



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

14 With that, I'm going to turn the podium over to Jim  
15 Fenton. This is the guy with the tie. If you haven't  
16 -- he came in a tad late, so you may not have seen this,  
17 but it's probably in the introduction here. Jim is the  
18 director of the UCF Florida Solar Energy Center, which  
19 is over in the Titusville, Cocoa Beach area. He's been  
20 in that role since January of '05. He leads a staff of  
21 140 folks in the research and development of energy  
22 technologies that are enhancing Florida's and the  
23 nation's economy, the environment, and it's focusing  
24 also on educating the public, students, and  
25 practitioners on the results of their research.

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

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

16          With that, Dr. Jim Fenton. Thank you.

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

1 states that have these renewable portfolio standards  
2 also have what we call a public benefit fund. Okay?  
3 You could argue it's a tax. Yes, it's a tax on your  
4 electric bill that helps offset the cost. It provides  
5 subsidy. Let me give you an example with the state of  
6 California. The state of California spends 550 million  
7 dollars a year on rebates to its citizens to buy down  
8 the cost of photovoltaics or solar thermal hot water on  
9 their roofs. 550 million. Now, California has twice  
10 the population the state of Florida does, so if we want  
11 a million solar roofs like California, this is easy.  
12 Just come up with two 275 million bucks a year. That's  
13 \$1.50 a month on your electric bill. That's what that  
14 cost is. So I'm going to take away a beer from every  
15 one of you once a month, and if you're smart, you steal  
16 your wife's. Okay? That's what it comes down to. Now,  
17 we were told, of course, that \$1.50 a month was too much  
18 money. Many of you who are in Progress Energy territory  
19 or in Florida Power and Light territory, you are going  
20 to be paying 6 to \$9 a month to purchase a nuclear power  
21 plant which won't turn on for 10 years. Okay? I'm not  
22 saying those are good or bad things, but if Florida  
23 wants to have a market and generate opportunities here  
24 in the state, we've gone forward. We're coming up with  
25 20 percent renewable portfolio standard. We have to

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

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

1 more valuable house. Okay? And guess what? We keep  
2 all the money in the state of Florida. It's simple.  
3 Every house in the state of Florida should be a zero  
4 energy home. Just to give you a flavor, Florida Power  
5 and Light generates 50 percent of all electricity in the  
6 state of Florida. 51 percent of the electricity is all  
7 used in your home. Guess what, you don't have to pay  
8 the bills. Make some upfront capital investments.  
9 Okay? Roughly, we can go ahead and improve our homes by  
10 30 percent at a levelized cost of about 5 cents a  
11 kilowatt hour. Remember, you're already paying 11.2 out  
12 of the wall. So this is just an issue about financing.  
13 okay? If you think about it this way, almost all of you  
14 have a mortgage. Okay? Now, the interesting thing is  
15 when we talk about energy efficiency, everybody comes to  
16 me, what's the payback, what's the payback. When you  
17 put that granite countertop in your kitchen, did you ask  
18 what the payback was? When you upped up for leather  
19 seats, did you ask what the payback was? Do you  
20 remember when TV was free? You are all paying 60 bucks  
21 a month for TV now, aren't you? I can't get a buck, 50  
22 out of you to go ahead and put PV panels all over your  
23 roof. Think about it. It's crazy what we're doing.  
24 Okay? The key here is that right now in Florida  
25 typically we were building about 190,000 homes a year.

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

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

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

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

1 he has, okay, but he uses this same plot -- but I'm  
2 going to give you a Florida flavor to it. I've added  
3 the state of Florida onto this plot as well. As you can  
4 see, the electricity used per person in the '60's up to  
5 the oil embargo in 1973, pretty much the whole nation  
6 was moving at a slope. After the Arab oil embargo, we  
7 slowed down, but California went flat. They actually  
8 went flat. Now, there's this misnomer that you got to  
9 use a lot of energy to generate economic wealth and some  
10 things like this. Well, California has proved that's  
11 not true. Their productivity and so forth is very good,  
12 but the electricity per person has gone flat. Now,  
13 let's slide all the way out to give you an economic  
14 context of what that means in Florida. Okay? Today, if  
15 we use 12 cents a kilowatt hour, that's 5,000 kilowatt  
16 hours a year per person. Okay? That's what the  
17 difference is between that sort of purple dot and the  
18 yellow dot. All right. So then 5,000 times 12 cents is  
19 \$600. We have 18 million people in Florida. We spend  
20 10 billion dollars a year extra on electricity than a  
21 person in California because our houses are built of  
22 crap and they've gone ahead and implemented good  
23 buildings. It's simple. Okay? We can fix this stuff.  
24 Okay? Lot of opportunities there.

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



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

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

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

18 Personally, peak oil is where the problem really  
19 is. Now, I put this plot here for you. This is a plot  
20 of the annual oil production and billions of barrels as  
21 a function of time. Now, I chose this particular peak  
22 oil plot for two reasons. One, it was published in  
23 1998. Okay? And, two the peak was in 2005. Now, I'll  
24 explain to you about what this means. So this actually  
25 shows then, if you look along this sort of orange jagged

1 line here, as times goes on from the '30's into the  
2 '80's, you can see the oil embargo in '73, we actually  
3 went down. We started using less oil. There is a lot  
4 of argument about peak oil as to exactly when the peak  
5 will occur. Okay. Everybody agrees that they know the  
6 amount of total oil we have on the planet. The argument  
7 is how efficiently can you get it out, at what cost can  
8 you get it out, and how much can you get it out. That's  
9 where all the disagreements are. But I chose this peak  
10 here because it was in 2005. Now, what we failed to do  
11 in 1998 was to think about China and India. Okay. That  
12 was into the long hair. So actually put a star up there  
13 for the actual 2005 energy use. Okay. Which is  
14 substantially above where the peak was before. So if  
15 you were to redraw this supply curve, if you will, on  
16 here, sort of keeping the area under the curve kind of  
17 conserved, we can argue about it. So when our -- I  
18 guess officially our former president announced three  
19 years ago that a child born today will be driving a  
20 hydrogen powered car -- and, by the way, since I work on  
21 fuel cells, I hope we do make those investments and we  
22 pull that off, okay -- I can tell you this, a child born  
23 then won't be driving a gasoline powered car because  
24 there won't be any left. The lowest value anything has  
25 is this energy value. If you can do anything with it,

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

5             Had some interesting things going on. Okay. The  
6       prices of everything seem to be jumping all over the  
7       place. The interesting thing is you should be aware of  
8       the fact that electricity -- I mentioned to you already,  
9       that it varies all over the United States, and that  
10      dictates markets and so on and so forth. Now, we're  
11      being very proactive. We're getting ahead of the curve  
12      here in Florida. And I do honestly believe that energy  
13      efficiency and alternative energy, it's all about jobs  
14      as well as solving some of our energy problems and  
15      keeping some of the wealth in this state, and these can  
16      be cost effective things over time that actually you  
17      make money doing all this, so we should do it. But you  
18      got to keep in mind, it's all relative to the cost. In  
19      our case, we ship all our money out of the state of  
20      Florida when we purchase any of this fossil fuel stuff.  
21      But things you should be aware of, the cost of  
22      electricity since after World War II has been relatively  
23      constant. Okay. Things really started changing in  
24      1998. You'll notice that all three of these curves, the  
25      upper one is retail gasoline prices, and this is a --

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

1       and as I mentioned in the United States, CAFE numbers,  
2       that's the blue around there, around the 23, okay?  
3       They've been pretty much that same value since the late  
4       '70's. I've got a cute story. I like to make this  
5       comment to any new 16 year old, 17 year old. You know,  
6       unlike your parents, my parents all gave them the keys  
7       to the car. Jim, anytime you want to drive, no problem.  
8       Oh, by the way, fill it up. So I'd go ahead and get  
9       around on my hands and knees, crawl around to the back  
10      of the car, look at my license plate, determine whether  
11      it ended in an odd or even number, which then gave me  
12      the privilege of sitting in line for two hours to  
13      purchase gasoline. Now, kids are smart. They know  
14      exactly how old I am. That was 1973, so I was 16. Do  
15      the math. But the interesting thing is that we can be  
16      more efficient. Most people that pay twice as much,  
17      okay, for a gallon of gasoline then have cars that are  
18      twice as efficient. No surprise. Okay. Now, I got one  
19      for you. The Brits. Okay. Do I have the UK on here?  
20      Yeah. Okay. So at the time we were paying 3.73, the  
21      United Kingdom was paying \$8.20. So you say, those poor  
22      English. Okay. They're paying twice as much for a  
23      gallon of gasoline. A gallon of gasoline doesn't mean  
24      anything. It's just a easy thing for you to pay. Okay?  
25      Now, the interesting thing is you pay twice as much for

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

1       Exxon or are you more upset about the banks? Oh, wait a  
2       minute. The banks are all out of business. I used to  
3       tell everybody that fuel cells are great. Whatever came  
4       out of General Motors two weeks later came out of the  
5       Department of Energy. Oops. What happens if General  
6       Motors is bankrupt. I may be unemployed. Interesting  
7       things to think about. Okay. Efficiency is where it is  
8       for transportation. I want to talk about this. This is  
9       our millions per barrel per day of oil. So you can see  
10      here I've got our business as usual case there. It's  
11      interesting. Every plot in the world looks like a  
12      function of time. Whatever you are doing goes up.  
13      Okay? And the whole goal in life should be, wait a  
14      minute, how do I get it not to go up and get it to  
15      flatten up. Told you about electricity per use. It's  
16      true with gasoline. Now, like I said, back in the  
17      '70's, we started importing. We got to the point where  
18      we were kind of, you know, importing 30 percent of our  
19      oil. Look at where we are today. And look if we  
20      continue on our path in 2030. Okay. Where do you think  
21      all the money's been going, folks? Okay. Now, what  
22      happens if we set up a goal that we want to go ahead and  
23      get off imported oil? Okay. So we went ahead and did a  
24      study about how we go ahead and do that. Okay. And,  
25      you know, I happen to be a republican, but drill, baby,



1       drill doesn't work, folks. Using the best, the absolute  
2       best scenarios for Anwar, getting other oil from off our  
3       coastlines, so on, so forth, you will notice that's at  
4       the bottom of my curve as I add it up there. And,  
5       furthermore, it doesn't even make up for the fact that  
6       our existing oil production has been dropping every year  
7       because the United States has exceeded its peak oil. So  
8       you can see here that those pretty colors that I have  
9       got down at the bottom don't even get me up to -- in  
10      2030 up to the point where I was in 2007. Okay. So the  
11      increased ethanol, Anwar and OCS don't even make up for  
12      the fact that the existing Alaska oil, the Texas oil,  
13      the California oil we already get is actually going down  
14      every year. Doesn't even make it. If you look at the  
15      top, though, look what increased miles per gallon does.  
16      T-Bone Pickens for a while was telling everybody, invest  
17      in wind farms so we can use that natural gas to fuel our  
18      cars. So we did that. That's helped a little bit  
19      there. Okay. If you cut back on your vehicle's miles  
20      travelled, which, by the way, congrats, you guys did  
21      that. You guys stopped driving. Great. Okay. All I  
22      got to do is convince people that electricity is a sin,  
23      gasoline is a sin, and tax the bejeebers out of it. It  
24      gets the desired behavior. You stopped sitting. Now,  
25      let's use that money for some good stuff. Interesting

1 things to think of. The reality is you got to do a  
2 little bit of everything to pull it off. So we can get  
3 off of imported oil in 2027 by doing a little bit of all  
4 these things. There is the take home message. To give  
5 you an example of the success that we have at UCF,  
6 everybody's heard of Gatorade. Do you know what the No.  
7 1 patent at UCF is? Okay. It's a ceiling fan. You can  
8 go buy one at Home Depot. By the way, UCF gets the  
9 proceeds from that. Okay. Helps keep some of my  
10 researchers alive. Well, they sold a million of these  
11 ceilings fans, and each one of these ceiling fans saves  
12 on average \$20 a year in electricity. We save 20  
13 million dollars a year on electricity from a simple  
14 little ceiling fan. Energy efficiency products and  
15 compliance and things are some nice markets to look  
16 into.

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

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

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

1 several of the building associations are working on.  
2 Basically, it's called the home energy rating index.  
3 Okay. And so, in this particular case, with this scale,  
4 a hundred here is listed as a new home built within 2006  
5 codes. Okay. Zero energy home is down there at zero.  
6 Okay. And, roughly, the average home here in the state  
7 of Florida is somewhere up around 150. Okay. And so  
8 your home's graded. Okay? I want everybody to require  
9 that your home gets graded, okay? It's useful  
10 information. Right now, you've got to get a radon test  
11 for everybody. Why not get your home graded? Every  
12 time you do a transaction, we should do that. Then we  
13 should provide the homeowner with various cost effective  
14 ways to make his home more energy efficient. We've got  
15 to start grading our homes. We'll be doing that soon.  
16       Solar hot water heating, solar hot water heaters.  
17 Here's some pictures for you. Photovoltaics. In  
18 Florida, in a lot of the cases photovoltaics are cost  
19 effective because you have to put transmission lines in.  
20 In the two Progress Energy nuclear power plants that  
21 we're talking about at 7 billion dollars apiece, you're  
22 going to spend 3 billion dollars for the wires. That's  
23 what you're going to do. It's a big huge, giant power  
24 plant. You've got to run wires all over the place, too.  
25 Okay. The neat thing about photovoltaics, you put it on

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

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

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

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



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

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

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

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

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

1       8.3 million, you do 100,000 a year on the new ones,  
2       isn't quick enough. By all means, let's fix the new  
3       building code. We've got to go in and have programs  
4       that makes it effective for the homeowners somehow,  
5       okay, to finance and go in and retrofit our existing  
6       homes. Okay? And so this is about financing, getting  
7       the audits in. I mean, you know, that guy, the poor  
8       homeowner that's giving up the beer? Okay, I want him  
9       to sit on his couch, eat his potatoes and watch football  
10      all the time, and magically the state of Florida somehow  
11      or other makes your house more valuable and lowers your  
12      electric bill. We've got to come up with a policy that  
13      does that. It's doable. It's called financing is what  
14      this really is.

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

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

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

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

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

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

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

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

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

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

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

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



1 emissions. Should Florida establish an automobile  
2 inspection?

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

18 You wanted to cut me off. Sorry.

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

21 MR. FENTON: Yes.

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

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

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

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

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

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

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

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

12 Siemens, or Westinghouse, I should say, has been a  
13 part of Orange County since 1980 when about 20 people  
14 moved into some rented office space at 1011 East  
15 Colonial. And then about a year later, there are about  
16 150 of them that moved out to an abandoned K-Mart at  
17 6655 East Colonial. And then in 1983, a little over 25  
18 years ago, we moved to our current campus out across the  
19 street from UCF. So we have partnered with UCF and been  
20 a part of Central Florida in the energy and power  
21 generation fields for 25 years now, and Orlando is home  
22 to all of us and we enjoy being here.

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

1       about Siemens' global portfolio of Cleantech and  
2       environmentally focused products and businesses, to talk  
3       specifically about the success story that the wind  
4       energy business has been to Siemens and to the Orlando  
5       facility for Siemens, then to talk really about three  
6       approaches for Cleantech growth through research in  
7       university partnerships and through venture capital  
8       funds and funding from venture capital firms, and then,  
9       lastly, to talk a little bit on federal funding and  
10      what's in the stimulus package that was proposed last  
11      week and will be making the press and headlines for the  
12      next month or so. So with that, basically Siemens is  
13      one of the largest electrical, electronics companies in  
14      the world in Euros, which means you multiply by 1.3,  
15      1.4, which means we're about a hundred billion dollar a  
16      year company with 427,000 employees worldwide, spend  
17      about 3.8 billion on R&D each year. That's in Euros.

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

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

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

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

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

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



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

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

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

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

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

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

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

1 inventors and we do a lot of research and development on  
2 our own. About 650 million the last year in R&D in  
3 energy. Plenty of engineers, lots of patent activity,  
4 lots of patent activity applications, as well as patent  
5 maintained. But a good deal of where our technology is  
6 coming from is from university research partnerships.  
7 UCF being just across the street has been our longest,  
8 and in the U.S. is our most active university partner,  
9 and certainly work with MIT and Carnegie Mellon and Penn  
10 State and Purdue, and not too far away, the University  
11 of Florida and Florida State and a few others. But we  
12 have more of our employees out here in Orlando. Over  
13 400 of them are UCF alumni, so we have sort of a natural  
14 base for people who know people, and partnerships and  
15 technology development kinds of things come from that.  
16 The three examples, the Siemens Energy Center basically  
17 is a turbo machinery research and development center  
18 that was just dedicated last fall, in part with the  
19 equipment and some cash donated from Siemens and the  
20 building facility located on the UCF campus, and about  
21 25 of our engineers are actively engaged in doing  
22 research with faculty and students out there. Also last  
23 fall, the Florida Center for Advanced Aero Propulsion,  
24 one of the state's centers of excellence, had its kick  
25 off meeting, and Siemens is pleased to provide at least

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

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

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

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

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



1 be provided, and a 76 page report on logic behind the  
2 258 page bill. Sometimes the report is far more  
3 confusing than the bill itself is, so, whatever. But  
4 basically what I wanted to do was highlight that now is  
5 a particularly good time to be pursuing energy  
6 technologies relative to funding or the funding  
7 opportunities that will exist coming out of the federal  
8 government. Out of the 825 billion dollar stimulus  
9 package, 54 million is Cleantech investment, and 54 --  
10 did I say million -- billion is cleantech investment.  
11 And a couple things in terms of energy systems, in terms  
12 of industrial energy efficiency, in terms of blocking  
13 grants to local governments and for developing -- both  
14 developing and deploying energy efficiency technologies,  
15 in terms of smart grid improvements, Gainesville GRU in  
16 implementing a feeding tariff is one part of what's  
17 necessary to achieve the highest gains in energy  
18 efficiency, electricity efficiency, improvements and  
19 reductions in consumption, because with that feeding  
20 tariff, you are encouraging people to make an economic  
21 decision on how to generate the realm of electricity or  
22 the time of day to use their electricity, and that's  
23 sort of essential to achieving the hasty reductions that  
24 are needed. In addition to that, the grants and loans  
25 to businesses relative to implementation of energy

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

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

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

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

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

10 MR. BEVC: Yes. The website for the House of  
11 Representatives is [www.house.gov](http://www.house.gov), and you'll see a link  
12 to the Appropriations Committee that will take you to,  
13 I'm sure, the biggest headline on the page, which is the  
14 stimulus bill.

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

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

19 MR. LEWIS: Design?

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

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

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

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

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

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

22 MR. LEWIS: It's an opportunity.

23 MR. BEVC: Sure.

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

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

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

19 Any other questions?

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

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

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

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

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

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

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



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

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

25 I'm responsible for the facility in Orlando. Like

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

9 UNIDENTIFIED SPEAKER: Is that the Orlando Central  
10 Park?

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

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

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

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

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

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

9               The second aspect of that is I think also most of  
10       us realize that, unfortunately, back in the '70's and  
11       '80's, most of the steel mill iron works production in  
12       this country went away. Especially the large ones. And  
13       it's coming back. It's trying to come back, and it  
14       needs to come back. That drives a lot of this industry,  
15       and if we think we've got some issues with the fuel  
16       consumption globally, we need to look at the steel  
17       consumption, so forth, to go global in China and India.  
18       With that, there is an opportunity now to use a blast  
19       furnace gas that is a by-product. That product not only  
20       helps their process be more efficient, but it's being  
21       utilized to again make a very cost effective method for  
22       generating power. That takes that technology down 22  
23       percent to get you to the next step cleaner. Probably  
24       won't get you all the way there, but it's a step in the  
25       right direction. This is being considered. We've been

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

5               We do have a solid oxide fuel cell and it is a  
6       product that we have a micro turbine attached to in  
7       2006. It's -- the opportunity here is it gives you  
8       about a 50 percent efficiency right off the bat. You  
9       think about how these other products, it took us awhile  
10      to get there, that's a good starting point. We have a  
11      model that we're putting in place to get us up to about  
12      a 275 kilowatt model. That's still very small, but it's  
13      a product that we've gotten that we're working with at  
14      this time.

15             Let's talk about the renewables. Again, I think I  
16      mentioned that we anticipate 30 percent of our portfolio  
17      in this market to be in this market by 2012. We sold  
18      our first wind turbine here in the United States in the  
19      '80's, and as we've already heard, most of those farms  
20      are out west. But they continue to grow and we've been  
21      very successful in that that was our largest growing  
22      product line the last two years. These wind turbines  
23      give us an opportunity for our current land base  
24      turbines, about 2.4 megawatts, and most of those cells  
25      are assembled in Japan, and the blades and the towers

1 here in the U.S. We hope to be assembling those as  
2 cells, but just like we talked earlier with the economic  
3 situation in the last quarter, we've got not only rate  
4 tariff issues, now we've got to look at the folks that  
5 are investing in this. I hope that it continues on  
6 because right now that's been one issue is that the  
7 sovereignty of the investors that we've got. Even  
8 though this is still a good investment, we've got some  
9 concern about some of those investors being able to live  
10 through this market with their other investments. So  
11 that's something to be looking at. This economy's going  
12 to drive not just this product, but all these folks that  
13 have multiple investments around, they're going to be  
14 watching this for a while, and we've seen, like everyone  
15 else, not necessarily a slow down, but they're much less  
16 aggressive than they were. This used to be a product  
17 that, if you had it, you could sell it. Now it's a  
18 product that folks are being a little less aggressive  
19 with. And still a very good 2.4 megawatts is ours on  
20 the land base, and as we've already said, this is -- the  
21 2.4 megawatt one is about a football field in diameter,  
22 and by 2012, that's probably the only product we'll be  
23 selling here in the United States. The one megawatts  
24 have been going very well, but, again, the larger fields  
25 are probably going to be a little bit smaller, and they

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

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



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

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

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

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

1 address.

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

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

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

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

22 Pretty good.

23 MS. CHADWICK: You rock.

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

1       someone with me that might be able to.

2               Any questions?

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

7               MR. WILLIAMS:  We do sell and support all the wind  
8 turbines out of here in Orlando.  The design and  
9 manufacture is done overseas, but the installation and  
10 the maintenance of those are done out of here.  At the  
11 factory that we run here in Orlando, we are -- probably  
12 95 percent of that product, the hardware that goes  
13 through manufacturing, is for the high efficiency gas  
14 turbines at the combined cycles plants, and like we've  
15 already mentioned, that's a choice that's been made.  
16 That's our primary source here in Florida for power  
17 generation.  The solar is going to be headquartered out  
18 of here.  In fact, the project leader is in Lake Mary  
19 for the installation of our facility, so the sale and  
20 project of that, we're still in discussions where that  
21 manufacturing would be.  As far as the batteries, that's  
22 entirely in the R&D group, still in Japan, although the  
23 combination of that would be led out of the sales group  
24 in Lake Mary.

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

1 manufacturing here.

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

12 So anything else?

13 Yes.

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

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

1       that.

2               MR. FENTON: Just as I mentioned, for 7 billion  
3       dollars for a nuclear power plant, we're going to spend  
4       3 billion dollars for the wires, okay? So that just  
5       gives you the context that we're at. The wires cost a  
6       lot of money.

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

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



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

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

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

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

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

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

4 John, do you have any other comments?

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

12 One thing I do want to mention is that when I held  
13 up the Cleantech study from San Diego and mentioned that  
14 other communities are doing these Cleantech studies,  
15 we're a step behind, but I think Orlando has  
16 demonstrated in the past that sometimes we start a step  
17 behind but we end up a couple steps ahead. About eight  
18 years or so ago, the Central Florida Technology  
19 Incubator was just a fledgling start up. In 2004, it  
20 was the No. 1 incubator in the United States by the  
21 National Incubator Administration. There is an advisory  
22 board council that was developed by the Small Business  
23 Development Center here after we started that, after the  
24 downturn of the economy following the September 11,  
25 2001. Other communities, Cleveland, for example,

1 already had advisory board councils. By the mid 2000's,  
2 our advisory board council program was selected as the  
3 No. 1 program in the world, business development program  
4 in the world, by the International Economic Development  
5 Council. When we started, some of you may remember the  
6 Angelo studies. He's a consultant out of Austin. And  
7 Orange County, the City of Orlando, and the EEC worked  
8 together to develop a high technology strategy. We  
9 didn't -- high tech was not really an integral part of  
10 our economic development strategy at that time. In  
11 2008, Fast Company magazine identified Orlando as one of  
12 the 12 best places in the world for innovation. So we  
13 can do this. Don't read too much into that when I hold  
14 up all these other things that other communities are  
15 doing and get the impression that we're not going to be  
16 able to catch up, because I think we can, especially  
17 with all of you participating in this.

18 So thanks for coming today.

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

21 (Symposium ended at 11:18 a.m.)  
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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  
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Dated this 7th day of February, 2009.

---

Leslie Richmond, RPR and  
Notary Public

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

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