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Financing Renewable Energy Projects- A Growing Green Portfolio

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Moderator: **Secretary of Energy Steven Chu**

Panelists: **James M. Modak**, Chief Financial Officer, Suniva
Karen Damiani, CFO, Advanced Green Technologies Inc.

P R O C E E D I N G S

CRAIG O'CONNOR, EX-IM BANK: As our initial speaker, Secretary Chu is charged with helping President Obama implement the agenda to invest alternative and renewable energy, address climate change and create millions of new jobs. We're already seeing the benefit of their investment with Ex-Im Bank. The investments they're making are helping companies export later, so we very much appreciate that.

Dr. Chu's work to develop alternative renewable energy is opening enormous opportunities for U.S. companies, as I mentioned, to help these companies successfully compete in the global

marketplace.

Prior to his appointment as Secretary of Energy by President Obama in January of 2009, Secretary Chu was Director of the Department of Energy's Lawrence Berkeley National Laboratory, Professor of Physics and Molecular Cell Biology at the University of California. He's not giving you any tutorials after the session, so never mind that.

Starting in 2004, motivated deep interest in climate change, and the nation is very fortunate in that regard. He led the Berkley laboratory in pursuit of new alternative and renewable energies. Secretary Chu is co-winner of the Nobel Prize for Physics in 1997. I give you Dr. Chu.

DR. CHU: Thank you. All right. So my job is to create jobs in the U.S. and create prosperity in the U.S. That's the way I fundamentally see it, and it's through the mechanism that we need to transition to a clean energy future.

This clean energy future is essentially a

new industrial revolution. The first industrial revolution gave us energy that went beyond the energy of humans and animals. And with that energy, you can plug a wire into a wall. Out jump seven to ten horses and clean your carpet. They don't soil your carpet. They clean it. It's early in the morning, you know. Not that early.

Okay. So -- so that's a remarkable revolution then that you have this energy to do things we want to do. But going forward, who's going to lead in this next industrial revolution will essentially determine who will lead in a competitive race worldwide. We want to also decrease our dependency on foreign oil. And finally, what's behind this new clean energy revolution, of course, are the risks of climate change.

So how are we doing in this new industrial revolution? Well, let's take one sector, photovoltaics. Silk and photo cells were invented in the United States, invented in a company I used to work for, AT&T Bell Laboratories.

And in 1996, we had about 45 percent of the market share, and it has plummeted to less than ten, about six percent roughly. Not good. So it is being overtaken by Europe, Japan and now, China.

How are we doing in some of the other energy technologies? Automobile fuel efficiency? We're lagging. Batteries? If you buy a -- a hybrid car in the United States, a Ford or Prius, you name it, 98 percent of those batteries are made abroad, typically in Asia.

Electricity transmission and distribution invented in the United States -- Edison, Westinghouse, Tesla. First electricity transmission distribution systems in the world, and yet, if you look and ask for where you can buy a power transformer and the large transmission distribution centers, not in the United States. Europe and now China's trying to take over from them. Power electronics.

Nuclear power. First nuclear reactor was built in the United States, Fermi. We are now

behind in that. It's -- it's France. It's Japan.
It's Korea.

We have lost in manufacturing. What really scares me is we have lost in hi-tech manufacturing. If you look at the United States, the European Union and China, China has now gone in high value products, hi-tech manufacturing. This is aerospace, pharmaceuticals, test equipment, something with a lot of high technology.

I would lob into that a programmable day/night thermostat is a hi-tech device. The really inexpensive thermostats are no longer made in the United States. We still make those, but we may lose that.

So -- so this is very, very scary. Some economists say not to worry. We're going to -- we'll shift to services -- financial services, personal services -- but I think we still need to have a core in manufacturing in the U.S. It's very important we don't give that away.

Now, China is also spending about \$9 billion a month on clean energy for two reasons.

First, their leadership is very vocal now, and they're saying that climate change, if we continue a "business as usual" trajectory -- China and the rest of the world -- climate change will be devastating to China. They just say that simply.

We, therefore, there are carbon -- growth in carbon emissions in China is completely unsustainable environmentally. And so they are closing down old, inefficient coal plants being -- making -- building the most efficient ones.

But more than that, they are diversifying their energy supply -- wind, solar, nuclear. Twenty-one nuclear reactors out of the 50-plus nuclear reactors in the world are being built today in China. They're moving into gas in a big way because it's lower carbon content. So they are working very hard to decrease their carbon emissions.

But the other reason they're doing it, and a primary driver is they see this as their future economic prosperity. They want to grow these industries. And if they grow these industries,

they will export them to the rest of the world.

So in the -- this economic competitiveness I'm going to make two predictions. The price of oil over the coming decades will go up. You just have to look at where the oil reserves are, the multi-nationals. They're mostly offshore now. And then you're going to higher cost oil, lower quality oil, bitumous oil, tar sands oil. The very tarry oil in Venezuela. Plus harder to reach oil.

So the lifting costs will be higher. The demand will go up. Therefore, it's not, you know, with a few exceptions, I think because of that the price of oil will go up. And we will live in a carbon constrained world.

Despite what you may hear in the blogs and things, the overwhelming evidence of climate change is growing stronger day by day, year by year. The last couple of decades the satellite data is becoming very, very convincing. The amount of solar energy hitting the earth is -- over a 30-year period is constant. Amount of sun spots,

everything. You name it, constant.

Greenhouse gases have been increasing. There is no doubt that they are due to humans. They have a radio isotopic signature that they're fossil fueled because the amount of radioactive carbon in the atmosphere is going down. Because once carbon is buried in the earth, it loses its radioactivity. And then when you release it by burning fossil fuel, you dilute the amount of radioactive carbon made by cosmic rays.

So -- so it's due to humans. The increase is due to humans. It's trapping more heat. And so the question is not, will the earth warm up as it has been? It's how much it will warm up. And so that's where the science is.

So -- so with those two realizations, the price of oil will be higher. We will live in a carbon con strained world. We have two choices. We can hope for \$30 a barrel oil and plan our economy based on the fact it might go down to under \$30 a barrel. We can hope that all this climate stuff is wrong. And after 20 years, that's okay.

Or you can say there's a reasonably good probability, a very high probability these two things are true.

If it is true, shouldn't we be preparing ourselves for this future? Europe and Asia are. And so if we don't move soon, we will be lagging and we will be importing their stuff to fix this problem.

And so to quote Wayne Gretzky when asked why was he such a good hockey player being a slender fellow, he says, "I skate to where the puck is going to be, not where it's been." Right now we're in a bit of a paralysis. We haven't -- and he also said, "You can't make a goal unless you shoot."

Right now, we're wondering, you know, is this really real? Should we delay it another four years, five years, ten years? Again, the world is going to be passing us by.

Wind and solar is a three and a half trillion dollar market. A whole market means you build up engineering and manufacturing expertise at

home, and then that energy and manufacturing expertise then is good for exporting.

Look at the wind industry in Denmark. You know, two decades ago they put in a very stable fiscal policy that would support wind. And so that -- out of that grew Vestas. It didn't come just by happenstance. The investors could say this -- this -- you know, the government will support this, and then the technology was developed.

As a result of that, the cost of wind generation went down by more than a factor of ten. And it's probably going to go down by another factor of -- 20, 30, 40 percent is my guess. Okay? So it's still plummeting as these wind turbines get better and better.

The president has said that part of our economic prosperity is that we have to pay more attention to exports. And he set a goal of doubling the exports in the next five years. And, again, what the world wants more than anything else is our highest technology exports, and much of that will come from the energy sector.

The Recovery Act has made an \$80 billion down payment on a clean energy economy. Largely to support jobs. 2 to 2.4 million jobs according to nonpartisan organizations like the Congressional Budget Office. That's just primary jobs, and if you include all the secondary jobs of people who now have money to spend, it's more than that.

But the reason we're doing that is this is the down payment on building a new energy infrastructure for that industrial revolution. And so as a result of that, for example, I mentioned that 90 percent of the advanced batteries are made in Asia. We are investing in the advanced battery manufacturing, and we hope that by 2012 we can capture -- we can get to 20 percent of the market. And again, jobs, but jobs that -- today and jobs of the future for the coming decades.

This is a picture of the first Chevy Volt plug-in hybrid battery. You can just tell from the size of that thing that we also need to improve the batteries, shrink it by a factor of two. Shrink the weight by a factor of two, but I -- we're also

doing that. The Department of Energy is working very hard, and we think that that would be technically possible in the next couple of years.

We're doing things, for example, like tax credits for advanced clean energy manufacturing. We awarded \$2.3 billion. An example of this is a company called Cardinal Fastener. It makes bolts.

This is a bolt held by one of my special advisors. Happened to be -- she took a class I gave in physics, a freshman seminar. The last class I taught at Stanford years ago. She was then in McKenzie, was going to go to -- had been accepted by Stanford Business School to go. McKenzie would have paid for sending her to Stanford Business School, and instead she chose to put her career on hold for two years to work in the Department of Energy.

Now, let me tell you about little bit about Cardinal Fastener. Why -- why is this -- it's a bolt company in the U.S. in Ohio. And it's exporting bolts around the world.

What's so special about these bolts?

Well, they're very well made bolts, number one.

But as I hunted around the website to find out why would people want to export bolts from Ohio to the rest of the world, they say "We manufacture and ship on the same day."

And so on their website -- I mean, they make very high quality bolts. Certified, tested, all these other things, that's number one. Very high strength, very good reputation.

But they paid attention to customer service and they said "Normally we -- upon receipt of the order, we will start shipping between one day and five days, one week, but if you really want expedited service, give us a call." Okay? Customer service. What a novel idea. It creates an export market. Okay?

So these grants in lieu of tax credits program is oversubscribed by three to one. This is a way to really stimulate the economy and stimulate the exports. Let me give you an example of these grants in lieu of tax credits. So the idea is you -- you establish a wind farm or solar farm. You're

going to get tax credits for eight or ten years.

Instead what we said is in order to help stimulate the economy, you turn that farm on, we'll give you a grant that's equivalent to your tax credits over that eight-year period. And what that has done is that brought in billions of dollars of new investment from abroad.

But those companies turned right around and said okay. That's good. We'll do another one. Our business model is sound. We'll do another wind farm. Or we're going to do another solar farm. And so it had a profound impact.

The meantime, from time of application to the time the money was in the bank was less than three weeks. So we can respond quickly, too. We're going to try to get that down to less than a week to keep up with Cardinal Fastener, which their motto is "We put the fast in fastener."

Loan guarantee program. We have offered 12 conditional loans. We're very intent on speeding this up. We inherited an organization where it would have taken on an order of four or

five years to make a loan. We've gotten that down to maybe a year, but I want to get that down to a third of a year. A couple of months, three or four months.

So we're very intent on doing that because we think these loans, especially in high-technology areas where the financial markets are not quite ready to make those investments that the U.S. government can -- can offer them a little more security.

Okay. We also are developing things that will make us a dominant force in this green energy revolution in the coming decades. We started a new program called Advance Research Projects Agency-Energy. It's modeled after DARPA. We are funding very high-risk, high-reward short-term things.

The program managers are experts in their own right, true experts. Stellar people who have given up jobs in academia and from the best institutions in the country. You know, MIT, UC Berkeley. Tenured positions to work here.

So they're identifying new projects that we think have a chance of hitting home runs. So it's a very venture capitalist spirit. We expect many of them to fail, but as you well know, a few home runs really transforms the landscape.

Energy Frontier Research Centers is mostly university-sponsored research, but with a clear goal, get out of your own department. Get out of your own research group. Make alliances, very tight alliances with others, not even necessarily in your own organization to solve a specific science problem that could lead to new energy solutions.

And finally, we're introducing energy innovation hubs. These are designed after the great laboratories that had to deliver the goods in a very limited amount of time. Los Alamos in the Manhattan Project springs to mind.

There's a lab called the Radiation Laboratory at MIT which was charged, get radar working. Get it working so we can deploy it in the field on ships and on airplanes. And so it put

together engineers and scientists as well as Los Alamos working together where you had some of the best basic research scientists learning about engineering because everybody felt responsible for the entire chain. Not, oh, I do. I proved a few mathematical theorems in, and my job is done. So it's one example.

I'm old enough to know the people that worked on the Manhattan Project and -- and the radar. And one person, a Nobel laureate who got his Nobel prize for inventing nuclear magnetic resonance. It led to MRI, magnetic resonance imaging. He got his Nobel Prize in the early 50's. Did his work in the late 40's, but while he was working on the Manhattan Project, he was both proving mathematical theorems and what might be possible, but he was also travelling down to (inaudible) Bell Laboratories because he said those people really knew how to engineer things that really worked. And they just lasted, and I wanted to know what they did. Okay?

So these innovation hubs are built on that

same attitude. Get a bunch of stellar people in there. Have the best scientists and engineers manage this, and then sparks will fly. So and we also very serious about improving our ability to not only innovate faster but get it out into the private sector faster.

Let me give you an example. I mentioned this already before. This is Edison's Pearl Street Station. The first electricity distribution transmission distribution system in the world, and yet we can't manufacture -- we don't manufacture high voltage transformers.

So the folks at RPE looked around and said where were things that are ripe for break through? A little two-year push with the right people and the right investments could really get us over the hump, and this is certainly one of them. The power electronics and grid scale electronics where the very best electrical engineers in the U.S. were going towards, you know, higher integrated circuits -- video chips, things of that nature.

And there's a bigger need now in power

electronics. And so the same smarts, same very best people can be urged to go into that. You know, the very smartest people, university professors. You know, people say it's like herding cats, and you can't really herd cats. You can by moving the food bowls.

Another emerging market are small modular reactors. These, again, something we'd lost. Even though General Electric and Westinghouse are major players, they're mostly owned by Japanese companies. Their nuclear power parts.

And one thing where we do have a potential lead is making small modular reactors. These are reactors, not a gigawatt. One and a half gigawatts. But something less than 300 megawatts. A hundred megawatts, even smaller.

These you can make in a factory, and you can stamp them out. Because you can mass-produce them, the production costs will go down. Not only that they would be good for export because many developing companies don't have an electrical system that could actually have the wires that can

handle one and a half billion watts of electricity from a modern power plant. But they can handle 300 million watts.

So it's also true in the United States. Also the cooling is much better. You don't need to be next to an ocean or a major river.

So this is something that can be mass-produced. We are now working with some companies. This is something where we really want to take the lead on. Because there's a vast market.

And so we're also creating international partnerships, creating new markets. We'll be hosting the first clean energy ministerial in the world in Washington D.C. this summer. And we're -- it's -- it's -- the major economy's forum plus a half dozen or so other economies who are very serious about energy investments and innovation.

And so let me just end by saying, as I said before, the cost of oil and other forms of energy will rise in the coming decades. We will live in a carbon constrained world. China and

Europe are moving very rapidly.

The most important thing we need more than anything else with all the carrots and grants in lieu of tax credits, production tax credits, all these -- those are all necessary. Renewable or clean energy portfolio standards -- all necessary, but we also need to put a price on carbon.

And where over 10, 20, 30, 50-year period there will be a definite signal. Because with that price on carbon, it really tells industry -- you know, we can give industry 10, 20 years to make adjustments and help them by developing new technology. But that's how you get the serious investment.

And right now there's a lot of money on the sidelines just sitting there. Because we don't know when it will happen. The dialogue is not if it will happen, it's when it will happen. Will it happen ten years from today? Five years from today? One year from today?

The other countries are saying we're moving, and so this is -- this is the issue that we

still have the opportunity to lead the world in this new industrial revolution and secure future prosperity. But time is running out and the train's leaving the station. Thank you.

(Applause.)

UNIDENTIFIED SPEAKER: You want to take a few questions, or do you have to leave?

DR. CHU: Yeah. No. A few questions.

UNIDENTIFIED SPEAKER: Okay. Secretary Chu can take a few questions if you want to step up to the mike and identify yourself if you would. Step up to the mike so the rest of the group can hear you. Thank you.

MR. ZANE: Thank you, Secretary, for the opportunity. My name Fidel Zane. I'm with E2 Logic Solar (ph). We're a startup and working in Nebraska.

We're planning to submit the Loan Guarantee Program, but it looks like it's very geared for large companies or a company who is actually inventing something. But what is the opportunity for a small company has innovation

ideas?

DR. CHU: Well, right now we have to evaluate the risk of the company, and it has to appear as -- well, let me start again. With large companies, you're quite right. Loans to very large companies like nuclear reactor power plants, these companies have a lot of assets. They have guaranteed power purchase agreements. It's a safe bet. Very low credit subsidies, if any.

And smaller companies, higher risk companies, we have to evaluate, pay attention to the taxpayers' money to make sure that what's going to be the risk of that loan and then adjust a -- what's called a credit subsidy for that.

In many instances that credit subsidy in some of the loan programs has to be borne by the small company. The small companies may not have the money to buy -- it could be a 30, 40 percent insurance. That has to be money up front. And so we realize this is a problem.

In this coming budget, we are asking for credits tax subsidies, half a billion dollars that

we can -- the federal government can share in the cost of that subsidy. Because in the end, it has to look -- we have to convince the OMB with the credit insurance, if you will, that the taxpayer's protected.

By sharing in the subsidy or by paying a large part of the subsidy, then -- the federal government, of course, will be subsidizing the loan, but I think that's the way -- the only way we can get the smaller, higher-risk companies to -- that we can offer loans to them.

We are also trying very hard to improve the way we do things. So right now they were geared for essentially hundreds of million dollars to billions of dollars worth of loans. And a lot of the smaller companies can't be put through that rigor. It -- it's too unwieldy.

So we are are trying to figure out how to make loans between the couple million to tens of millions of dollars. We have made a few tens of million dollar loans, but not that many.

Again, this is internal within the

department, but part of it is also statute. We can't do like this -- Small Business Administration where they say the financial -- you know, they -- they give this to some bank investment house and let the bank investment house do the due diligence on the financial side. But we're forbidden by statute to do that. We have to deal with each loan as a one-off.

And so we're still looking for mechanisms to -- to help with the smaller companies. But it's something we're -- we know it's a problem. We're working very hard. It's -- it's a daily thinking exercise quite frankly on my part.

This -- the loans are such an important part of the economic stimulus, and -- and how do you get the innovation machine in the U.S. going again until the credits free up. So it's something very much on our mind.

MR. ZANE: Thank you.

MR. SARIN: I'm Yogi Sarin (ph) from Petron Scientech. Secretary Chu, on this biofuels guidelines on DOE for helping in view of this food

controversy, what are the latest thinking on that to reduce carbon emissions and other things?

DR. CHU: Sure.

MR. SARIN: Especially on biofuels? Thank you.

DR. CHU: Well, what -- what we're doing is we want to -- we're doing a lot of -- we have a lot of research investments, both laboratory R&D investments, but also demoing on ways to first, make sure we're using all the biowaste. This is wheat straw, rice straw, you know, corn cobs, things of that nature to -- to convert -- and lumber waste material, to convert that into biofuels.

The other thing are grasses that don't need as much water, that won't compete with prime agricultural land. And so we think kind of grasses trees, lum- -- agriculture and lumber wastes, it can make a very big impact, but we need technology that will make it become cost-effective.

Now, in the laboratory, there have been great things happening. Where I see possibly a few

years out, you -- in fact, some of the things are already being piloted now on a small scale. But we'll just have to wait and see. Right now, selassic (ph) biofuel is not cost-competitive without subsidy to be quite frank, but that is our goal.

Now, if we can get it cost-competitive without subsidy -- you know, it's an Oak Ridge study that says we can probably replace enough of the personal transportation of gasoline with -- with -- could greatly reduce it or even eliminate foreign imports just from biofuels.

But even if you're -- give it half that, you can cut it by half. The other parts we can do by -- so being really conservative, just divide that number by a factor two. Cut our imports in half. Better mileage, electrification, we can do a lot.

UNIDENTIFIED SPEAKER: Hi, Secretary Chu. I came from Shanghai just to attend this conference, and I have a specific question that's on a quite sensitive topic.

We talked about the Chinese really putting a lot of money in developing clean energy technologies. One of the things I do is work with the State of Nevada trying to attract foreign investment into the state to develop and -- and manufacture clean technology.

So are our recovery funds available for foreign companies who are interested in coming to the U.S. to set up shop to do R&D as well as production? Thank you.

DR. CHU: Well, yes. Let me give you an example. Vestas I mentioned before. I visited Vestas in Colorado. They have invested about \$600 million in plants that would serve North America. If we showed signs that we're serious about this, and they have stable fiscal policies that will allow long-term investments, they -- they plan to go to \$2 billion worth of investment in the U.S.

Now, let's talk about, you know, how many American jobs that's creating. What's the fraction of foreign versus American investment? According

to our records and what we know of, we -- roughly 62 percent of the value of the parts for wind stuff in the United States are made domestically. And if you include then, the installation costs, the -- you know, the costs of the labor to erect which is all domestic. It could be a little bit higher. Say roughly two-thirds.

So unlike some of the blogs that you hear about that said 80 percent of the value is foreign, the way they did that is they look at Vestas. Oh, Vestas. Foreign company. That's a hundred percent foreign.

You go and visit a Vestas plant, they say, well, we're about three-quarters American-made parts, and we're going to drive it to a higher fraction. But they want domestic supply lines because for the same reason they're manufactured in the U.S. They don't want to be subject to currency fluctuations.

China's a little bit different. There's not currency fluctuation there, but -- but -- but in other countries, definitely that.

Now, so -- so I think as we develop more of a market in the United States -- I mean, two years ago, the fraction of worth of the windmills was less than 50 percent American worth.

UNIDENTIFIED SPEAKER: Right.

DR. CHU: Okay? So the -- the thing here is get the industry demand going in the U.S. Then you bring in manufacturing starting from abroad, but it goes more and more to American. As soon as there's a market and -- and U.S. investors and worldwide investors see that there's a market, I see the fraction of worth going higher and higher and higher -- in the U.S.

And so these -- so I -- I -- it's not what you read in the -- some of the news articles in the papers. You know, the majority of value of these things are American jobs, and that fraction will go higher and higher and higher. So the goal is to get that fraction higher.

UNIDENTIFIED SPEAKER: Thank you.

DR. CHU: Okay? But I would say consider the opposite, you know? American company that's

abroad. The fraction of jobs is abroad. We get upset about that. You're getting upset about America building a factory in China? Creating Chinese jobs? Well, you know, that's of concern.

And so, you know, it's -- so -- what it's about is having an environment in the United States that promotes innovation and goes along the lines I've talked about of a new industrial revolution. If we do that, the United States innovation machine is better than anything else in the world, and that makes exports.

UNIDENTIFIED SPEAKER: Good morning, Secretary Chu. Thank you very much, sir, for giving us insights of not so much of where we should be, but where we have to go and the example of you cannot make the goal unless you shoot. In terms of our company, Eye For Now Solutions, we are primarily the e-learning focusing on climate change practices, carbon (inaudible) and carbon (inaudible) are some every time modules that we are working on to create awareness working with various organizations.

But the other part of our company which is focusing on alternate energy devices primarily into solid state lighting, the question to you is how can we leverage -- I know you have a major program coordinator at the Department of Energy focusing primarily on this, and they're doing a great job. But how can we leverage some of that to start a manufacturing facility in the U.S. given the tight market from the credit perspective?

DR. CHU: Sure. Well, we're doing a few things. First in LED's we're -- we're actually investing in ways to make the Gallium nitride much less expensive. We're looking everywhere in the food chain specific for salicylate lighting.

I met with a group that -- we have an Energy Frontier Research Center in Santa Barbara. I met with -- including the inventor of the blue LED is there. A very outstanding group of scientists and engineers. And I said -- I encouraged them, they're driving through more and more efficient LED's. Okay? Lumens per watt. But I said but most of the LED now is in the heat

exchange and how you suck the heat out of the LED's. So you can make -- you can double the lumens per watt, but most of the value's there.

So why don't you, the scientists and engineers on the material side work -- go get some heat exchange people. Again, heat exchange is a big deal. How do you suck the heat out? You can -- innovative heat pipe mechanism.

So -- so you look at the whole integrated unit. Okay? And that's where -- again, where American innovation, so it's not low cost. It's clever manufacturing. And -- and that's where we think we can dominate so (inaudible) doesn't have to send manufacturing overseas. And other things.

So it's -- we're looking very much -- that's another technology that -- that because of the great intellectual capability of the American research universities, national labs and entrepreneurs, we want to really make sure that it's the whole product that delivers the goods. Not we got a better LED, and then we're going to send it to China. They're going to figure out how

to do the heat exchange.

All right. And if -- if we figure out here, then we can make it here in very efficient plants, and we will be competitive.

UNIDENTIFIED SPEAKER: Maybe time for -- time for -- just --

UNIDENTIFIED SPEAKER: One -- one way to (inaudible) the heat exchange and we'll talk about it.

DR. CHU: Yeah.

UNIDENTIFIED SPEAKER: Just one more question briefly, please.

UNIDENTIFIED SPEAKER: Yes. Secretary Chu, I come from Morocco, a country that has a free trade agreement with the United States, and I'm a wind developer. And I appreciate it very much you raising the issue of Vestas investments in the United States.

My question is very simple. Do you think it's too early for the United States to engage globally in the wind energy markets especially, for instance, European markets. We're in Morocco.

We're at the doorstep of Europe, and we'd like to know whether the U.S. would be interested in developing these perspectives.

Also want to tell you that we have received some NATO funding to boost up the capacities in colleges in Morocco and Mauritania to build up smart campuses and do a regional wind resource assessment. And we're looking forward to have the U.S. engage in our activities. Thank you.

DR. CHU: And so the short answer to your question, is it too early for the United States to look at wind as a major export? No, absolutely not.

I think, again, what I'm seeing on the ground where a very innovative wind company has been in business for quite a while, Clipper Wind. You know, a multi-transmission gear box that takes the stress so it's not a single -- single drive train. Great. So they can now think of ten megawatt wind turbines.

If you look at where the blades are going, they're mostly still fiberglass. There's a lot of

hand-work in there still. There's now typically spars of carbon fiber in the center, but if you look at the Boeing 787, that's a carbon fiber wing. The only difference between a 787 or a 747 and the wind turbine blades are the wind turbine blades are three times longer. Or four times longer.

So we -- we need to develop those technologies to have all carbon fiber highly automated, very strong, and very light. That -- those are -- you know, gear boxes or direct drive train, and it's the blades. And if we can -- we can make them very reliable which includes the lighter weighting, that will -- we can be the dominant force. You know, this is stuff that we're good at. So why shouldn't we be a player in the international market?

UNIDENTIFIED SPEAKER: Okay. Thank you.

UNIDENTIFIED SPEAKER: Thank you very much. That -- that was really fantastic. Thank you, again, Dr. Chu. I -- I think the gentleman's question, last question's a great segue to the rest of the panel. It's definitely not too early for

the U.S. to think about exporting these technologies.

Yesterday you heard from Clipper Wind. That was their first-ever export sale. There's a number of wind projects in the works. And by the way, for Morocco, I think our project finance division knows better than I do, but they did the first IPP in Morocco, (inaudible) so we've got real expertise in that area.

What I'm going to do now is just give you a quick little report card on Ex-Im Bank, the Office of Renewable Energy, and then we'll go to our panel. Advance Screen Technologies, Karen Damiani and Suniva, Jim Modak.

Just since we created the Office of Renewable Energy two years ago at the behest of Congress, Ex-Im Bank last year support -- authorized \$363 million worth of -- worth of authorizations that supported \$639 million worth of renewable energy worth of exports. 105 of that was renewable energy. So far for the first two months of this fiscal year we've already surpassed that.

So we're looking at a pipeline of probably close to 300 million just in renewable energy. And so this is technology whose time has come.

Yesterday we were really fortunate to -- to receive President Obama here. You know, one quote I'd like to repeat that he said a number of times is that the country that leads the world in clean energy will lead the global economy. And I think that's -- it's not just idle musings.

If you look at the ten trillion dollars that countries are going to have to spend over the next 30 years, ten trillion dollars according to the International Energy Association, 18 percent of that right now is renewable energy. It could easily, thanks to the investments of Dr. Chu and the Department of Energy, we could get that up to 50 percent. You're talking about a five trillion dollar market.

Energy, as many of you know, is the largest industry in the world. So the time is definitely now to do this.

At Ex-Im Bank we feel we have a key role

to play. One thing I -- again, I mentioned our Office of Renewable Energy, and one of my colleagues, Alexander McCann, who is over here, expertise in project finance, ten-plus years at Ex-Im Bank. We have another colleague of ours, but he's on the west coast right now. He's in Mexico doing business development, so he's not with us, but we -- we're very interested in working with you and helping you to create bankable projects. And we -- that's an important part of our -- our job.

One of the things I should mention is the 18-year repayment terms that the OECD allows us to make. 18-year -- could be 18-year guaranteed loan. Could be 18-year direct loan. Interest rates are probably as attractive as you're ever going to find, so this is -- this is my advertisement to our friend from Morocco that -- and the dollar is also nice versus the Euro right now. So you should think about the U.S.

We also have a true hunger, I think, at Ex-Im Bank. I think that's the right word to increase our support for -- for renewable energy.

So next, I want to -- I want to lead the way with introducing Jim Modak from Suniva. And Suniva's an interesting company. I met Jim and John Baumstark, whom many of you saw yesterday introducing the President. Six months before they had their factory online, and they said, well, we'd heard, you know, about some of the things you guys are doing at Ex-Im Bank. And I said, look, we're very interested in supporting you.

They have the most effective, most efficient cell in the business. So Secretary Chu is right, we are manufacturing in the United States. We will manufacture in the United States. This is a company that's also taking folks that were previously unemployed from automobile factories in the Atlanta area and putting them to work.

We've supported them with short-term insurance. I won't even give you the number of the pipeline we have in which Suniva is a supplier on a number of projects. So this is pretty exciting what they're doing now, so I give you Jim Modak.

(Applause.)

You know, while we're getting the presentation hooked up, you know, I -- I get this question from a lot of my colleagues. I've been at the bank for 17 years. And when I first became the bank's environmental liaison officer in '94, people thought I was kind of, you know, throwing away a good career. I was a loan officer, and why do you want to do this environmental liaison officer business? But you could see where it was going. The writing was on the wall.

And how real is renewable energy? Let me leave you with a couple things. Last year half of the new electricity generated capacity installed in the United States was renewable energy. Last year half of the renewable energy of -- of the installed capacity for electricity in Europe was renewable energy. I think that speaks for itself.

MR. MODAK: Thank you, Craig, for your comments. Appreciate it. And welcome to the Ex-Im Conference. It's been a great partnership with Craig and the Ex-Im people.

As he said, we walked into his office and Pam Bower's office two years ago and said, we think we got an idea. We -- we'd gotten some financing from the VC world, and we've taken it from there. And I'll -- I'll spend a few minutes describing kind of what we're doing.

So our mission is really to make solar sensible. Now, I'm the CFO, so I'm going to give you our -- our definition of making it sensible. It -- it's very, very easy. It's having very high efficient cells and high-powered panels, intersecting that with low-cost manufacturing that's going to come close to the Chinese. We think we've identified key areas of our manufacturing processes that quite frankly have IP as part of them that reduce our cost to -- to operate that makes it within sniffing distance of the Chinese.

And that intersection of the high efficient, high-powered, and low-cost we think is a winner in the -- in the solar space.

Now, it's not just rhetoric. We actually

are in production. We have a hundred -- a hundred megawatts of production capacity in Atlanta, Georgia. In the next four weeks it will be up to 175 megawatts of production capacity. We are sold out for this year.

Dr. -- Dr. Chu if we had -- if we had the capacity, we would -- we could sell three times as much of our current capacity. That's how much the demand is.

And why is that demand? We're the -- we're one of the -- the -- the best most efficient solar cells in the world. And certainly it generated from the IP that we -- that we have created, not only from Suniva, but its heritage which I'll talk about in a second.

The high-powered modules that we have are leading the -- the country in high-powered modules throughout the world. All of our research is done here in the U.S. 150 employees are in Atlanta, Georgia. We've been very successful in getting a lot of customers, principally overseas.

Last year in 2009, 90 percent of our

business was exported. This year, it will probably be 80 to 85 percent on five-fold the size of the production and revenues.

We are VC backed, and we've got great partners that have -- that have teamed with us to collaborate in our early success. We're only a two-year old company.

We've got a great management team that collaborates with solar experience -- and -- and business experience. Just three people in our solar side have over 120 years' experience in the solar space. So while we are a couple-year-old company, we've got decades worth of research, patents, and process knowledge.

On the business side, there are three of us that have worked together in three other engagements. We think we know how to build a business with good foundation, and we're going to collaborate with the solar expertise we have to give it a shot.

A little bit about our heritage. We are a public to private story. So the company was formed

out of the heritage of Georgia Tech University founded by -- the PV program founded by Dr. Ajeet Rohatgi. You see on the top left, you see all the -- just a few of the awards that Dr. Rohatgi has gotten.

He's -- he's one of the top two or three solar scientists in the world. In fact, as we were talking with Craig two-plus years ago, we didn't have a plant. We were getting a billion dollars worth of orders over -- over five years in the future. And it wasn't because John and I were good at managing a business. It was because Dr. Rohatgi had an exquisite reputation unparalleled in the world. He opened doors for us that quite frankly, we -- we wouldn't have been able to have opened.

He started the PV program in the mid-80's at Georgia Tech after -- after beginning his engineering career at Westinghouse three decades ago. In the early 90's the Department of Energy co-sponsored with Georgia Tech and Dr. Rohatgi to build the first University Center for Excellence in Photovoltaics or UCEP. It was -- it was challenged

with innovating technology for the PV industry, but making sure it was collaborating with the industry such that the end result would be highly commercialized research.

So it wasn't research for the sake of world record sales. Dr. Rohatgi has several on his walls at Georgia Tech. He stopped putting them up there. He stopped putting them up there not because he's ashamed of the world records, but it doesn't -- the race to world records is meaningless unless it's commercialized and can be manufactured.

Once again, the intersection, he's always focused on how do we produce things at lost-cost manufacturing steps?

I've touched on a little bit of our capacity. We have a hundred thousand square feet in Atlanta. We -- we just began operations of that first production line in the fall of 2008. As I mentioned earlier, our third production line getting us up to a 175 megawatts will be installed in the next four weeks.

We're pretty maniacal about meeting and

executing to our deadlines. We think that's important. Because we think it's -- it is a race to success, and we're behind. We're behind in -- in the U.S. market in the sense of the -- the -- the lack of U.S. manufacturing jobs.

So in addition to the 175 megawatts we have here, we hope to -- to -- to expand with a 400 megawatt plant in Saginaw, Michigan. We've applied through the 1703 and funding through 1705 Department of Energy loan program.

And we're -- we're working as diligently as we can to provide jobs, over 500 direct and 2100 total jobs including indirect to Saginaw, Michigan. I don't know if anyone has ever been to Saginaw.

We selected -- we selected Michigan and Saginaw as we did a U.S. based research of several states in the U.S. They were -- they were very supportive. The local economy is suffering with unemployment of over 20 percent. And over 35 percent live at or below the poverty level.

So I think we've got other than opportunity to create almost 600 megawatts of

production capacity, a total of 650 to 700 jobs in the U.S. and still compete in the world markets.

This just shows you a few of our installations, all of which are outside of the -- outside of the U.S. Again, 90 percent of our business last year was outside of the U.S. In the top left-hand corner is a project in New Delhi. It's a one megawatt project on the roof of the Commonwealth Stadium. In fact, it's my understanding that a cabinet member might visit that site in the next three weeks.

On the top right-hand corner and the bottom left-hand corner are the two largest solar-powered power plants in -- in all of India. Top one is a three megawatt project that is expected to grow to 10 to 12. And the bottom is about a one and a half megawatt project in different parts of India.

On the bottom is another one from -- another one of our installs in Italy. We couldn't have done this without the support of the various products of Ex-Im Bank. They've been instrumental

and a partner with us. As I said, they've been very creative, supportive, and we look forward to those four or five opportunities growing in other parts of Europe.

I'd just close with this. We've -- we've -- all of us have quoted President Obama several times both today and -- and yesterday. But I want to paraphrase a few of his comments that he mentioned in February of 2009.

"We've invented solar technology, but we've fallen behind. It's time for America to lead again." We're going to give it a shot. We think we've got the support of people like the Ex-Im Bank. We certainly have got the support of the Department of Energy. They're part of our heritage with the founding of the Center for Excellence many years ago.

We're going to do the best we can to -- to provide a quality set of products at -- at achievable pricing that will work in both the domestic U.S. market as well as abroad.

And I close with the tag that's at the

bottom, and this is something that we quite frankly live and breathe with. It's American innovation. It's American jobs. And we're going to try and be -- have American leadership. Thank you.

(Applause.)

UNIDENTIFIED SPEAKER: Thank you very much, Jim. That was excellent. I mean, you can see the -- the dynamism you get when you combine great technology, great scientific minds with great business people.

I should also mention that we're working very hard at Ex-Im Bank to find a way to quickly facilitate this business we're getting in. One of the other sessions right now is introducing our solar fast track. And that's where solar transactions under \$10 million, we're going to try to get those out the door in about 30 days.

And a guy that's spearheading that is over here, Charles Goes (ph). So we're going to try to get Charles some help because we've already got his plate pretty full.

Our next speaker is Karen Damiani (ph),

the CFO from Advanced Green Technologies. We've met Advanced Green Technologies a number of years ago at a conference and kept up our discussions. But they had some very near term assistance that they needed, and we were happy that we were able to come through for them. So, Karen, the floor is yours.

MS. DAMIANI: Hi, my name's Karen Damiani, and I'm the CFO for Advanced Green Technologies, commonly referred to as AGT. I'd like to thank Craig for inviting me here to talk about AGT and our work with Ex-Im Bank. We're relatively new to Ex-Im Bank, and so far it's been a very positive experience.

AGT is an engineering, procurement and construction company, focused on valuated distribution of the photovoltaic equipment. AGT was born from our sister roofing company, Advanced Roofing, which is among the ten largest roofing companies in the United States and has been in business for over 27 years.

AGT sources product, designs systems,

trains contractors in both the classroom and on the roofs, provides quality control on-site, and also provides turnkey solutions. AGT has trained and teamed up with contractors worldwide. The dots on the map show where we have some contractor relationships all around the world.

Historically we've conducted business primarily in the United States, Canada, and Western Europe with -- with scattered sales in the Middle East and South America. We're headquartered in Fort Lauderdale, Florida with branches in the Netherlands, France and Canada.

AGT focus is on four markets or channels; commercial, residential, utility scale, and international. We found out early on that selling solar is not answering the question of, what can solar save me on my electric bill? But instead, how can solar utilize tax incentives? And what is the return on investment?

We found out that our audience wasn't the building owners and property managers that we were used to from our sister company, but instead CFO's

and financial advisors.

AGT works with a set of financial structuring and capital partners to structure power purchase agreements, lease buybacks, partnership flips and creative financing options.

AGT's product mix consists of three main products. Our preference is to sell U.S. made products, and all three of them are made in the U.S.

AGT started off with flexible amorphous silicon. AGT's trade name for this product is FlexLight. This is a very unique product. It's the size of a credit card, and it's flexible, so it could fit around things and over things. This product is manufactured in Michigan.

Coming from a roofing background, this appealed to us because it didn't penetrate the roof, has low wind resistance, no worries in hurricanes. There's no racking. It just adheres directly to the roof. It's fairly inexpensive to install and weighs one pound per square foot. FlexLight works well in low light, but does require

a large foot print. A good environment for FlexLight might be in Florida where there are wind load issues, hurricanes, and frequently cloudy weather.

AGT then added rigid crystalline silicon panels or the glass panels that most people think of when they think of solar panels to its product line. We primarily use the Suniva product, which you just heard about, but we do carry some other manufacturers and use them when appropriate.

Suniva is headquartered in Georgia.

There are two applications for the crystalline, to either penetrate the roof or to use a ballast to weight it down. The weight of this panel is five pounds per square foot include -- not including the weight of the ballast. So this application really can only be used on a building with a strong roofing system.

One of the great things about the crystalline is that it can be put on a variety of roofs due to the many different type of racking systems available.

When the economy began to struggle, the price of the crystalline panels dropped fairly dramatically as opposed to the one manufacture of the FlexLight, there's quite a bit of competition for the crystalline panels, and that caused the price to drop more dramatically.

At this point the price to install the crystalline panels was even cheaper than the FlexLight in many instances.

We started selling the crystalline in situations where we needed more concentration because the crystalline panels require a smaller footprint than the FlexLight.

Of the many applications for crystalline, one situation where it could be used would be in the Southwest where there are few weather issues. It hardly rains, and you get plenty of direct sunlight. And of course, on a building with a strong roof.

Our newest product is cylindrical CIGS or Solyndra. They are glass tubes that sit over a reflective roof. This product is manufactured in

California. Solyndra actually received a Department of Energy Recovery Act grant to fund the expansion of their facility.

Solyndra is more dense than the FlexLight, but not as dense as the crystalline. It is the most expensive technology of the three, but the cheapest to install. It weighs two and a half pounds per square foot and does not penetrate the roof. When it's all put together it's very heavy, and it just weighs itself down. However, that makes it the not -- not the best alternative in heavy wind situations.

One of the appeals of the Solyndra product is that the federal government has come out to say that the reflective roof can be included on the basis for your tax credit. How much of the roof install is included isn't clearly defined, but many states are also following suit and allowing the roof to be included in their -- the basis for the state tax credits as well.

A good location for a Solyndra install would be in western North Carolina where there are

no wind issues and where they have generous state tax credits. Maybe putting it on an old roof where you can reroof and use the Solyndra product and take the federal and state tax credits on both.

Here I've highlighted three different types of typical installations for us. They all happen to be FlexLight installations. The first one is a Nike plant in Oregon. In this instance, a U.S. contractor sold and installed the system. Selling through a contractor in the U.S. is where we started. This is our core.

We provided them with our typical 30-day terms and abided by the state lien laws to protect our receivables.

Our next example is a printing facility in France. In this case, the roofing manufacturer is also the contractor. This is common in Europe to sell directly to the manufacturer or contractor. In Europe our typical terms are 60 days with a letter of credit or insured receivables with Ex-Im Bank or to prepay. In this instance, the customer prepaid.

The last example is a turnkey solution for three new construction buildings in Belgium. In this case, AGT was managed to hire the install. AGT procured the product and hired the local labor to do the install. AGT provided project management and quality control on-site for the duration of the project.

The billing schedule was based on the install, and contained varying payment terms. In this case, we insured our receivables with Ex-Im Bank.

To date, what we've been working with Ex-Im bank is insuring our foreign receivables. This enables us to offer up to 360-day open account terms to our customers. It also allows us to get advances on our local line of credit once we have them insured.

We have obtained a short-term multi-buyer credit insurance policy. The policy duration is one year. The overall policy limit is \$5 million in aggregate. So we can have \$5 million insured outstanding at one time.

The individual buyers get approved under special buyer credit limit endorsements. And these are pre-approvals for our customers. What we needed to provide Ex-Im with was references, financials, and credit backgrounds on these customers.

Our individual buyers have been approved for a maximum of one million dollars. So they can have one million dollars outstanding insured at any one time.

We also have discretionary buyer credit limits on our policy. Our limits are \$100,000 for existing customers, and \$50,000 for new customers. These require no pre-approval.

So this means if we have a new customer, we can insure the first \$50,000 without getting any sort of pre-approval. Then once the customer becomes repetitive, we can go up to \$100,000 at any one time. If we need any higher limits, then we go -- have to go to the SBCL endorsements.

Our policy has a \$60,000 deductible. And the policy is very easy to manage. All we have to

do is once we've generated the invoice, we just have to go online, report the shipment, and pay the premium. That's it. And then if the customer happens to be in default, we can file a claim 90 days after the due date.

Where we're really focusing now is Canada. Ontario just came on board with a very generous feed-in tariff. Feed-in tariff is where the utility is regulated to buy the power back at a specific rate depending on the roof size and the installation type which you can see from the slide.

Our target market is closest to the 250 KW system. And that's because we feel most of the commercial buildings are going to fall in that range.

Here I've shown three different solar project models that we're using in Canada. A subset of which we're using in Europe. We have more diversity in Canada thanks to the robust relationships we have formed with Zed Financial Partners and Trapeze Asset Management. Together we have formed AGT Energy Management, which is a

Canadian entity that finances renewables.

In the first model, AGT Energy Management obtains investors who own the system and rent the roof space. AGT Energy Management contracts with AGT Solar to manage the system. AGT Solar is another Canadian entity we formed, which is a wholly owned subsidiary of AGT Inc. in the U.S. and is also an EPC company. In this instance, AGT Energy Management would be seeking the financing from Ex-Im Bank.

The next model is where the customer is the building owner and owns the system. This is mostly what we're doing in Europe, too. In this case, AGT Solar would sell the system to the customer or building owner who would be seeking the financing from Ex-Im Bank.

The final model is where AGT Energy Management and the building owner share ownership in the system. Again, this partnership would -- this partnership would contract out with AGT Solar to manage the system. In this case, both parties could potentially be seeking financing from Ex-Im

Bank.

Our strategy is to enter into long-term relationship with Ex-Im Bank. We can get a leg up on our competition by teaming up with Ex-Im Bank and making the financing process as streamlined as possible for our customers. If we can facilitate the financing for our customers, we can be ahead of the curve, especially in Ontario, where the feed-in tariff has just come on board.

Needless to say, we're very interested in learning more about the Solar Express Program that they just announced yesterday.

If you have any questions, you can contact me or my colleague, David Louis, who's in the audience. He is the VP of Business Management.

Thank you.

(Applause.)

UNIDENTIFIED SPEAKER: Thank you, Karen. That was a great perspective of the industry, what's going on, incorporating your strategy. You know, the 18-year terms locks opens up a lot of markets that we hadn't looked at in the past along

with the financial crisis, so we get a lot of calls from projects in Canada and Europe.

And, you know, many of you that are familiar with Ex-Im Bank know the term additionality, so that means that we should be additional. Well, our additionality is if we can help a company in Morocco or Europe buy U.S. made solar products over the Chinese, that's our additionality.

So I know we just have a few minutes before lunch. But we have time for some questions, I think. So please step up to the mike if you have a pressing question.

See this slot is very dangerous right before lunch. The -- the only more -- the only more dangerous slot is the one after lunch. Well, I think we have a question.

UNIDENTIFIED SPEAKER: Yes. I had a question about the Solar Express Program and what exactly technologies it does cover. If it's not just photovoltaic or wind, it's something different but renewable. Is there a definition that you have

yet as to what -- what kind of technologies it will apply to?

UNIDENTIFIED SPEAKER: Right. Great question. Right now it's -- it's designed for solar photovoltaic, although we're hoping to ramp out that model of other -- other technologies. It doesn't mean that we can't do other technologies that are below ten million. But what we're -- what we're trying to react to is a lot of demand for photovoltaic for that spot.

I mean, Karen just articulated how the Solar Roof Program in Canada is going to generate a lot of business. A lot of those projects tend to be smaller. So we needed to find a way that we could -- we could handle the applications.

So we're looking at certain parameters that we'll announce. But we're -- you know, we're looking at probably 25 percent equity, debt service coverage (inaudible) of 1.5. So we have some automatic criteria that if you -- if the project meets these criteria, it's automatically approved. If it misses one or two, then we have the genius of

Charles to figure out how we can still -- approve the transaction.

Other questions? Well, thank you very much for attending -- Oh, we have one more question. Sorry. Sorry.

UNIDENTIFIED SPEAKER: I have a question regarding the exposure fee for the renewable project. As there is discussion into transforming the flat fee into a (inaudible) fee. Do you have any of that on this point?

CRAIG O'CONNOR, EX-IM BANK: Well, the exposure fee, that's -- that's a challenge. We know that in certain markets, the exposure fee, that can also be financed as part of Ex-Im Bank's loan. It's pretty manageable. We know that in some emerging markets the fee can be pretty high.

Right now there's discussion ongoing within the OECD on addressing that issue, but I don't have anything to report at this conference. Maybe next year if you ask the same question, we'll have a better answer.

UNIDENTIFIED SPEAKER: Thank you.

CRAIG O'CONNOR, EX-IM BANK: So with that
I guess we should break for lunch. And thank you
very much everybody.

(Conclusion of recorded material.)