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Biofuels and Biofoods: The Global Challenges of Emerging Technologies
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SESSION II. INDUSTRY, POLICY, AND SUSTAINABILITY

October 18, 2007 – 2:00 – 4:30 p.m.

Conversation with Speakers and Participants

Moderator: Gregory Geoffroy

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Audience Questions/Comments (Q)

Geoffroy Thank you, and I'd like to thank all of our speakers for putting us ahead of schedule. And so what we will do now is take a few minutes to have dialog among the speakers on the topics that have been addressed. And then after about 15 or 20 minutes we'll open the floor for questions from the audience.

We have heard in various ways in this afternoon's session about the increasing demand for the use of plants to produce food and fuel from the perspective of international trade, the need to continue to feed the hungry of the world, and the importance of biotechnology and a science-based approach to find ways to simultaneously meet these needs. And I wonder if any of our speakers would like to address that broad topic further or the comments from their colleagues.

Sullivan I'll take one quick point that I wanted to underscore that I thought Chris made that was so good at the end on the issue of public diplomacy, public outreach. That's an area where we as a government often focus internationally. Sometimes we fail, sometimes we don't do such a good job. But I think that the issue is critical, because it gets you to the point where, he mentioned, that you can gain support or you can lose support for policies and development paths. And a lot of it depends on the knowledge base of the average citizen. And I think, as the government, we try to do that, but I think in many ways the people in this room are much better equipped, much more numerous. And I think the issue is really, as Chris mentioned, it's a critical one.

Greenwood Just maybe two comments, one about the domestic political situation right now and another one about perhaps the European situation. I think I've never seen – and I've been in elected politics for 24 years – I've never seen a coalition form so quickly around an issue as has been formed around the idea of cellulosic ethanol. Because it has brought out the agricultural community, obviously; it has brought out the environmental community that is concerned about greenhouse gases; it has been supported by those who are focused on foreign policy issues and concerned

about our reliance on energy from unstable regions. So this has happened very quickly. The congressional action, President Bush's action, talking about switchgrass in his State of the Union addresses, has brought a much quicker result. When you get \$1.3 billion dollars that quickly into the Farm Bill, it demonstrates the width, the breadth of the public policy support.

And the other comment, with regard to Europe – it's interesting. The Europeans, when they think about and talk about biotechnology, they talk about red biotechnology, green biotechnology, and white biotechnology. Red being healthcare applications, and they tend to be very strongly in favor of that. Green biotechnology, GMOs, genetically enhanced crops, they tend in Europe to be quite resistant to that. And then the white biotechnology, which is the applications that have environmental and fuel possibilities.

And with the advent of the need or the focus on bioengineering plants that have become more efficient so that you can replace fossil fuels to reduce greenhouse gases, there is a moment of truth, I think, coming among many of our European friends where they're realizing, if they are so keen in Europe on solving the problem of greenhouse gases, that I think this may be a moment when they really have to think in a very focused fashion about their acceptance of GMOs.

Powell

Thank you. Perhaps on a slightly different track but the same issue, and it picks up the point that Dr. Borlaug made in his comments shortly before lunch – the link between hunger and education. We have 130 million school-age kids who don't go to school; most of them are girls, almost all of them are in developing countries. The main reasons they don't go to school are hunger and poverty.

So if we are able to deal with the issue of hunger by getting children to school, then not only do you deal with the short-term issue of immediate hunger, you deal with the longer-term issue of broad-based development. What do we know will happen? The nutritional status of that girl and her family will double. Her chances of contracting HIV and AIDS will plummet. The number of children she will typically have will reduce from well over six to a little over three. She will be a more productive and active member in the society. And we keep having this kind of mismatch where we talk about agriculture, farmers – note, in Africa, it's women – and keep referring to them as "he." We have a real disconnect. The issue of hunger is gender-based in Africa, just as it is elsewhere.

The second point that I would make is that I think we need to occasionally transpose ourselves and look a little about how we might look to others. If you are sitting in Niger right now, second largest country geographically in sub-Saharan Africa, population 730 million, what do you know? Three-quarters of you are living on less than a dollar a day. Three-quarters of you have never spent a day in school. Each family is going to have 8.7 children. Life expectancy, mid-forties. And one child in five will die before they reach five.

Unless we can deal with that package of problems, all of which impinge directly on hunger, it's difficult for me at least to see how you can engage them in a conversation about biotechnology. Who are you going to talk to? Who are we going to talk to? [applause]

Greenwood If I may, there's one thing that I would add to that, though, is that I think many of the girls who are not in school are also, some of them are not in school because they're in the fields working on the farms. And if, through genetically enhanced crops, we can increase the productivity so that the farm becomes more productive, so that there's more income for the farm family, I think there's been a fair amount of evidence that that has in many instances freed the young ladies to leave the production requirements of the farm and attend school.

Geoffroy Chris, I believe you were going to speak to that?

Policinski Well, it really is to reinforce those two comments. I think that the notion of addressing the issue of hunger through a direct means, and also through addressing the issue of poverty, which has a distinct linkage to education, there's not a lot to argue with there – that's something that needs to be done. And one of the ways to do that is by leveraging science and technology to be more productive. It both increases supply, as I said in my comments, and fuels economic growth that provides available income to buy more food and fuel. So I think that's a good point, and I think science and technology are involved in being part of the solution there.

I also want to come back to a point that was made right at the outset here. And that is, while on one hand my comments were about science and technology and the impact it can have, my real point was just what was emphasized, and that is: We really need to, as those directly involved in agriculture and agribusiness, lean into creating the right public forum for reasoned, fact-based debate around the things that aggressive use of technology can do.

And I do see some warning signs in the industry. As we market to segments, sometimes based on emotion, sometimes based on absence claims that have little impact on food quality – in my mind, that isn't directly related to the topic at hand here, but it's the tip of the iceberg of allowing emotion, personal or business agendas to influence the debate around how we feed or now fuel the world.

And I think it's far too important to leave it to chance, especially when you think of the very small percentage of folks who are directly involved in agriculture. And you can pick your 2 percent or your 4 to 1 ratio of suburban and urban to rural. It is a very dangerous situation to be in for those of us involved in the food business, broadly defined, to step up and lean into that debate and make sure it's rational and fact-based.

And that, as I said in my comments, isn't code for being reckless, and it will have some consequence because the application of science and technology, or the

acknowledgement that marketing against any segment based on emotion isn't good marketing, is going to be controversial. But we need to address it.

Geoffroy Several of our speakers spoke about the importance of the role of biotechnology and genetically modified plants to effectively address this competition issue between food and fuels produced from plants. But yet there are certain parts of the world, notably Europe, that have a tremendous resistance to genetically modified plants. And that was the first I'd heard of the red-green-white approach, but still that resistance is very, very strong. And I wonder if the panelists would like to comment on – with that resistance as strong as it is, how will we aggressively move biotechnology solutions forward?

Greenwood Well, to some extent it would go back to what I said a moment ago, which is that I think, with the urgency among, particularly, Europeans on the question of greenhouse gases, I think there will be a bit of a reckoning there where they'll need to make some firm decisions. As far as I can tell, the European resistance to GMOs is based on what they would refer to as a cautionary principle, which is not to say, "We have looked at GMOs and we have seen that there are health problems associated with their consumption," but rather they take the view that, "Well, we haven't had enough time to see that there aren't."

I think we're rapidly approaching the period where we can say, "Well, we have had enough time." And the vast amount of corn, soy and cotton produced in this country is genetically enhanced – we've seen the benefits in terms of reduction in pesticides, we've seen the benefits in reduction of erosion from no-till farming, we've seen the benefits in terms of production, and we've seen nothing in the way of harmful health effects. And I think it's just a question of time until this notion that we haven't had enough time yet begins to make less and less of an impression.

Geoffroy Any of our other speakers wish to address that?

Policinski I think in a sense that's just a case in point around in fact moving this discussion from emotion, or a conservative, cautious approach, to a new science-based, to a fact-based debate around the reality. I think that it is terrific to hear that we're moving into that era. I also think we have to be cautious in the sense that some of the resistance in the developed economies around biotechnology is what I'll call a comfortable resistance. We enjoy the fruits of the productivity of the technological advances in agriculture over the last however many decades. And I think from that comfortable perch we're maybe a little more judgmental than we need to be about new technology and the potential it holds to bringing the rest of the world along in terms of feeding hungry folks, as well as fueling the new biotechnology industry.

Geoffroy I'd like to – Dan, were you going to comment?

Sullivan Just to follow up on that, I mean again, from our perspective – and we are having, as we speak, discussions on this issue with the Europeans, given the state of the WTO case – but we're very much focused on the importance of establishing and implementing a science-based regulatory system. And that's where our focus has been. Not on forcing European consumers to consume these products.

And I also think one of the other arguments that we've been touching on here as a panel is that, in the developing world, the significant potential here, whether the continued potential here with regard to issues of disease-resistant crops, increasing productivity in the agriculture sector – that's another area that this case obviously has ramifications on. And I think it's arguments like that that can also help with our colleagues in Europe to help move this in a direction that we think is a more constructive direction.

Geoffroy I'd like to open the questioning up to members of the audience. We have a microphone in the middle of the room, and I think the best approach would be for those who wish to ask questions to move to the microphone, and we'll proceed in order of the lineup. So we have a person back here already.

Q I'm Pat Binns. I'm a consultant from Seattle, Washington, and I have kind of an observation and a question for the panelists. And that is – What I've been hearing today is very much a focused discussion about biofuels primarily as a solution to industrial, liquid transport fuel, energy security kinds of needs and concerns. But what I think we're missing is that biofuels also has a tremendous promise for self-sufficiency rural development with very low-tech biotechnology applications.

And it really concerns me that so much of our scientific attention, public policy attention, and industrial engineering efforts are really focused only on large-scale, industrial solutions that will deliver world trade commodities of biofuels. And we're not looking at the fact that even with pure, straight plant oil, vegetable oils, villages can use this fuel for water pumping, for driving mechanical motors, for grain grinding, and so forth – definitely for small-scale diesel, biodiesel or plant oil generation for electric power. And these things can be done on a decentralized scale where you also have all of the seedcake, the residues that can be immediately returned for either fertilizing the land or feeding livestock to extend animal husbandry as well.

And it seems to me that there are a lot of potentials for addressing the food and poverty alleviation opportunities and that we're missing them because we're looking at only the high-end solutions. And there is a tremendous number of lower-end solutions that are more immediately available. And I'd be interested in the panel's comments on that.

Geoffroy Any takers?

Sullivan Yeah, I think it's a great point. And I think it's a very good point, and I think one of the initiatives that I highlighted as our work with our strategic partnership with

Brazil with regard to Western Hemisphere biofuels, and we are focusing now in four countries in Central America for reasons very much focused – it's not at all focused on their export potentials. It's very much focused on the ability of domestic production and addressing some of the rural development issues and employment issues that you mentioned. So I think it's a very legitimate point.

Greenwood I would just say that starch-based distillation to produce alcohol is certainly something that can be done at a very small level, as the moonshiners in Appalachia taught us a long time ago. If the issue is, can we use cellulosic technology? – that's a long way, I think, from a rural African village capacity because you're talking about specialized enzymes to break down the cellulose.

Q I'll just report that I would agree. I think very small-scale ethanol production is possible. I would recommend, though, that the women in the village run the system, not the men. And I would also say that in the cellulosic...

Greenwood That's usually the cases I've seen.

Q The second thing is that in the cellulosic area, while there's tremendous potential for ethanol from cellulose, what you can see in many parts of the Third World is they're now doing first-generation cellulosic energy conversion to biogas for both processed heat, power and so forth. And again this is low-hanging fruit, in my opinion, but it's escaping the attention of most of the, you know, well-resourced both industrial and governmental policy initiatives that are looking to basically help provide greater food for people.

Geoffroy Thank you. We'll move to the second question.

Q Hi. My name is Suzanne Hunt. I'm based in Washington, and my question is for Mr. Sullivan. I first wanted to congratulate you on the leadership that the State Department has taken on on this issue, and I'm very excited about the third-market development and some of that work that you're doing. And while biofuels are a very controversial topic, I think one of the things that we can agree on is that they can be produced in a very sustainable way where they help us solve many of the problems that we've been discussing here, and they can also be produced very unsustainably.

So figuring out how we define sustainability with biofuels production and how we ensure that, I think, is one of the critical questions moving forward. And you mentioned that the State Department is working on this, and I'm wondering – in my experience it's been one of the areas that's been kind of slow to get going – so I'm wondering what is going on and what you think should be done. And I'll leave it with that.

Sullivan Well, as you know, we work obviously very closely with our colleagues at the Department of Agriculture and the Department of Energy on many of these issues. The sustainability issue, again, I think is obviously a very important one.

And I think that one thing that I've seen, at least in discussions, there are again some issues that you hear, stories that become kind of legends about significant deforestation because of what's happening in the developing world with regard to biofuels. We haven't actually seen a lot of evidence of that, but I think with regard to sustainability, it's, again, another key issue.

One of the issues that we think is important – again, in some of the third countries that we're cooperating with Brazil on – looks to the current crops they're using and trying to increase their capacity, whether it's with corn or sugar cane. And so it's an issue that we're focused on both at a small scale – but it's primarily small scale in a lot of these countries – and in the effect that it has on the environment. And we think in general that it will have a net positive impact. Particularly in a lot of these countries because, as was mentioned earlier, in some of these countries, the percentage of their GDP that is dedicated to paying for the imports of oil is enormous. So again there are so many different issues that come into the mix, but obviously sustainability is one area that we have been focused on.

Geoffroy I might add that the sustainability issue is important right here in Iowa as we switch from a more traditional corn-and-beans rotation to corn on corn on corn on corn – and what that does to the sustainability of the land or the productivity of the land while also raising many environmental concerns about the increasing fertilizers that are needed. So the sustainability issue is a very broad one from many different perspectives.

Q I would just quickly suggest that perhaps a more direct effort in sustainability, both from the industry side and the government side, would be a wise public relations strategy in terms of developing and maintaining public support for this.

Sullivan Can I be so rude as to ask her a follow-up question? What would be a recommendation, more specifically? We're always looking for good public diplomacy opportunities.

Q Well, I don't want to give my whole speech for tomorrow now, so hopefully you'll be here tomorrow. But for instance, the GBEP that was presented this morning by Ms. Visconti – one of their priorities is the development of sustainability criteria, so that we can agree on what it means and then figure out how to ensure it. And the U.S. trade guys have actually delayed that process and requested more information, and so perhaps State Department jumping in there and helping to move that forward in that fora could be helpful. There's also several other international fora that I'm happy to talk with you about later, as well as U.S. efforts going on.

Geoffroy Thank you. Pedro.

Q (Pedro Sanchez) I'm delighted with the tone set at this symposium, especially by the last speaker when he said the choices have to be made in a rational, responsible and science-based manner. Thank goodness, and at the end science

does prevail. So the issue of biotechnology, the allergy to biotechnology by Europe has suffered a real, deadly blow by the publication a few months ago by three Swiss scientists of a review of ten years of biotech crops in Europe and the fact that they found zero environmental damage. This is not an American product. This is a European product. So I think the resistance, the allergy, which was ideologically and politically motivated is eroding and will probably go away soon.

Now, there are a couple things here that I think it's important to put the science-based part of it. Biotechnology has a tremendous potential to solve world hunger, but in the case of Africa, before you tackle any – before we can see any real improvements in crop biotechnology, we must tackle the basic two core issues, which are soil fertility depletion and erratic water management. And Norman Borlaug is the first one who would say that. So let's keep it in perspective in the sense that you've got to have decent soil with sufficient water to do the job. And we cannot breed biotechnologically crops that do not need nutrients or anything like that.

The other point I want to make, and I saw it here, is a couple of mentions about using crop residues of cornstalks for biofuels. That is extremely dangerous and against science, because this is the way that we recycle about 50 percent of the biomass that is producing the field right back into the soil, and that's what gives you the soil organic matter, and that's what gives us the sustainability. Please do not touch those crop residues, as economically attractive as they may be, because it will be a real, serious problem.

Geoffroy Pedro, I'm going to have to comment on that, on a couple of your points. I saw some of the great research that we're doing at Iowa State a few weeks ago, on cover-cropping with corn and double-cropping, in order to allow total harvest of the grain and the stover, but while still having a cover crop to protect the surface from erosion as well as continue to replenish the soil with carbon. So there's still a lot of work to be done, but there are agronomic approaches that may address those concerns.

On the other topic you raised, we are also doing research at Iowa State that I think has enormous potential that couples biofuels with biofoods, and that is thermo-chemical processing of biomass, leaves and char, and agrichar, that we have shown, when applied to poor soils, significantly increase the productivity of those soils. And so there are potentials of enhancing the productivity of the soil while also generating biofuels.

Q That's fine, Greg. If you can add enough carbon and enough nutrients by other ways, that's what we want.

Geoffroy Any comments from the panel?

Policinski Just a quick one. First, thank you. It sounds like I arrived a little late, but there was a lot of commonality in our comments. One of the points was a fact-based or

scientific-based discussion in my comments. The other one that I want to emphasize (and you actually said it, but it's worth emphasizing again) is the obligation those of us involved in agribusiness or agriculture have to bring those facts to the broader public debate, not just within our own community. And again, pick your 2 percent or 4-to-1 ratio of urban/suburban versus rural residents. We need to get that message out there. You talked about the four scientists who published the paper; I think that's a great example, but we need to do a lot more about pushing into the general public debate the reality of the situation we are facing in agriculture and agribusiness.

Geoffroy Our next speaker or question.

Q Yes. I'm Birgitte Ahring. I come from the Technical University of Denmark. I am also a cofounder of a company called Biogasol that is actually within the second-generation biofuel production, and therefore I am very happy to be here today. As Dr. Greenwood was saying that we are actually right now getting pretty much ready – within the next five years, we will see a real revolution with the use of residues and the use of plant material, the cellulosic biofuel production.

But this message, it seems like a message that's very, very difficult, actually, to get out to part of the world. For instance, OECD has recently published a report where they actually pointed to all the negative parts of biofuel production and all the subsidies that go into the field and at the same time said that, as they foresee, it was a very long horizon before we could see second-generation biofuels. And I think this could be damaging sometimes. It seems like it's very hard actually to teach what's going on really in the real world to some policymakers. That's one of my comments. I don't know if you want to comment to that before I go to the next.

Geoffroy Any commentary on that?

Sullivan We had some problems with that OECD report and the way it was conducted and some of the conclusions. And again I think it goes to the very issue that everybody is underscoring here, is the importance of the public diplomacy debate, making that debate based on science. And we happen to believe from the President on down that this cellulosic potential and implications are very significant, and I think we're going to continue to push that message, at least from the U.S. Government's perspective.

Greenwood We also had trouble with that report, and I think the proof will be in the pudding. I think that the skeptics – not to be at all offensive – but if you subtract out the agricultural protectionism and you subtract out some of this sort of anti-Americanism and you subtract out some of the anti-corporatism that's lurking around this, and just leave the facts standing where they are – I think once this is successfully done in a significant scale in the U.S., it will be very difficult to quarrel with.

Q And one other comment I have is actually the price on enzymes that was quoted – 10 to 18 cents. There is no – there is actually, just lately, I think two or three days ago, actually, there was the first enzyme company coming up with a product. Before that you could not buy these enzymes. Maybe there was a lot of money put into that field from DOE, but it didn't lead to any kind of product. And of course there wasn't even a market for it.

But if you look at actually what you can purchase enzymes for, you unfortunately are not there yet. But I fully agree that, of course, that would come with development, but just to say that – I don't know you could buy that for 20 cents per gallon today.

Greenwood I think you're right. I actually think we're not quite there yet. There is so much effort going into this by so many private-sector companies and so much work by governments that I think it's simply a matter of time until we will be able to buy those enzymes commercially. It's a real private-sector race to be the first to be able to do that.

Q I will soon leave. One other comment I would say is that I think it's very important not to have a discussion where we point to one technology over the other. I think that, for instance, biogas is a fantastic technology, especially, also, together with ethanol technologies. I'll actually discuss that tomorrow in the talk I'll give. I think things go hand in hand. We need gasification, we need all of it; and we should not really beat each other with it, you know, with our technology.

Geoffroy Well said, thank you.

Q (Margaret Catley-Carlson) Thanks. If I can begin with a P.S. – you didn't like the OECD report, but what are you doing about it? In public diplomacy terms, maybe working with some of the like-minded in Europe, including some environmental groups, and asking the OECD if you can reopen the debate on their floor might be a rather good way to at least pick up on that? But that isn't why I asked. That's just one of your public diplomacy suggestions.

Sullivan I'll just give you a quick answer to that. The U.S. Ambassador to OECD is Connie Marella, who is a very dear friend of mine, a former colleague, and so we are working in regard to see what we can do with that.

Q Okay. Just don't make it a letter to the editor. I wanted to take the floor to ask about subsidy. Subsidy has bedeviled agricultural trade for a very, very long time. Its effects on the exports of developing countries are certainly problematical. Certainly this is one of the major elements that are inhibiting the conclusion of the Doha Round. And I came to Iowa with the assumption, which I must have picked up somewhere, that the current pattern of subsidy on ethanol production would make moving to the next stages a little stickier than it might necessarily be.

Can you comment on what would be an enlightened pattern of subsidy, if in fact subsidy is necessary, to avoid encapsulating a certain technology or a certain stage of this progression and to ensure that it moves on towards the more desirable future that most people in this room seem to feel possibly exists? We've seen too many instances when subsidies seem to inter something in place. So I'd be interested in your views on what an enlightened subsidy policy would be, if indeed any are needed.

Geoffroy An extremely important question. Who wishes to take that one?

Greenwood Well, I think that as long as there is the subsidy on starch-based ethanol that there is, in order to give cellulosic ethanol a fair shake, you have to have a comparable subsidy. I think the hope always is that, once the commercial practicality of cellulosic ethanol is demonstrated and then the prices become very competitive, as a former of congress, I would argue that you would want that subsidy to fade away. But will it? Well, I don't have that crystal ball.

Sullivan I can comment more generally. An enlightened ethanol subsidy, I think just to be honest – that would clearly stretch my knowledge base, so I'm not even going to fake it. But what I can say is, more generally, with regard to your initial point about the subsidies and the effect on development, and it being a sticking point in the current round of the Doha negotiations, you're absolutely correct.

And it's something that I think from a negotiation perspective we have consistently, and even more so recently, signaled some flexibility and, depending on how you look at it – maybe not in Iowa, but – ambition with regard to what we would commit; obviously any Doha deal has to be agreed to by Congress. And the President has even stated in September of '05 at the U.N., the U.S. would dramatically cut or eliminate agricultural subsidies of other countries do so as well, and we have commensurate market access. So I think the desire is there, but as Secretary Johanns has mentioned, as many others have mentioned, the desire to unilaterally cut without the European Union, Japanese, and others who have significantly higher levels than we do on the ag subsidies, is not the path that we think is the most useful in negotiations.

Q I'm George Beran, and I'm from Iowa State University. When I first received the information on this "Global Challenges" and had written there, "Biofood and Biofuels," my thought immediately went to food aid and the World Food Program that gives food aid, and I figured, well, I bet that we'll be talking fuel aid today as well. But we haven't.

In a number of developing countries I've watched as people pumped water by hand, where the power-operated pump was right there, but there wasn't any fuel to operate it. I've seen small tractors that weren't being used because there wasn't fuel to run them. I've seen electric generators that weren't being used because there wasn't any fuel to operate them. Is there any need for a system of fuel aid to the poor countries that would operate mechanically their technology if they had

the fuel aid to do it with? Seemed like a silly question, but the more I thought about it, the more I thought, “Maybe it isn’t.”

Geoffroy It also relates to the commentary of the first questioner.

Q Yes, it does.

Geoffroy Any...?

Policinski Well, I don’t know of any programs either. I think my own comment on that, similar to the earlier question or comment made, is it’s a terrific idea. It points to self-sufficiency. It’s a great idea in and of itself, but it reinforces another important point in this debate. There’s not “a” food in the biofuels debate, there are many; and there are many solutions to that as well. You know, from our own direct involvement around the terrific work that USAID funds and the USDA’s Foreign Agricultural Service funds, we see firsthand the impact of developing self-sufficient economies around agriculture that address this issue of poverty, which is intimately linked to the issue of hunger. So I think it’s a great idea in and of itself, but I also think it points to the fact that this is not one debate; it’s a debate that’s got many, many facets.

Powell I think there’s also a fair amount of work being done to try to bring solar power into villages so that they can have a modicum of electricity that they can develop right there in the village.

Geoffroy Thanks, George. We’re going to restrict, I think, our questioners to the two that are standing, because we’re approaching the end of the session.

Q I’m Melinda Kimble from the United Nations Foundation based in Washington, DC. And we are a partner in the Global Bioenergy Partnership, and work closely with the State Department’s initiative in the Western Hemisphere to promote bioenergy.

I think it’s really important – I wanted to make clarification about this recent OECD report that seems so controversial. First of all, this report was a product of the OECD Roundtable on Sustainable Development. It was aimed at exploring the dynamics of subsidies in the biofuels area and whether they were accomplishing all of the things we hope biofuels can achieve, including energy security and opportunities for new energy production in the developing world.

The report’s real, I think, importance was – it stimulated a dialogue among ministers who walked away from that meeting saying we don’t have all the answers. And just as you mentioned on your point about fuel and food, there are many elements and many angles to this problem.

The thing I believe is critical, however, as we go forward – if we are going to realize both the promise of Doha and the promise of agroenergy – is to really start

looking at the subsidies, incentive structures, and tariff frameworks throughout Europe and the United States, so that we begin to level the playing field and really optimize the importance of this new opportunity.

Geoffroy Thank you for those comments.

Q My name is Paul Sugg. I'm a graduate from Iowa State, by the way, and I run my own NGO. In fact, I liquidated every dime I have in the United States and moved to Africa. I've been in development for 30 years, been a consultant for Land O'Lakes International Development Division, but I work with now with the Appropriate Technology think tank and development wing for other NGOs working in Uganda. And the issues that concern me – I wish it were all just a matter of science; there are a few other dimensions that we've got to apply.

If we're looking at biotechnology fuels, and biotechnology wonders in the Third World, there's a couple things I asked Hugh Grant about. I said, "What are you doing for testing, to make sure that we're going to see the environmental-friendly aspects?" And that is, we cannot make assumptions that agriculture in the Third World and agronomic conditions are the same that we see in the United States – that we ensure that we are going to see the bang for the buck invested for the smallholder farmer.

And in addition to that, you have to look at things in an economic development holism. Listening to the ambassador from South Africa, she made some of the most pointed remarks. If we're looking at the reconciliation of tradeoff between production and nutritional food and crops for biofuels, and the same crops are going to satisfy both, you still have an issue to reconcile – that is, what you're going to be using for fuel you're obviously still not going to eat.

And we have to deal with the issues of, one, land fragmentation, and land size of smallholder farmers in Africa, if we're going to start dealing realistically with African issues. Two, if we're going to see biofuel serve as an answer, there's only one way that's going to happen. We have to come up with a concerted approach to define the point at labor to capital scale intensity of appropriate technology and agricultural small-scale mechanization for farmers and how they're going to feasibly access that at a method that does a cost-benefit analysis favoring the smallholder farmer and not technology dumping, where if we gave them 60-horsepower tractors, you know, God is not going to rain diesel fuel and spare parts from heaven – these guys are still going to go broke.

And we have to look at one point that seems to be missed, and that's the point of economic optimality, and this is what we've been working with with the NGOs, the smallholder farmers in Africa. What's the optimal size farm that we're going to have to get to? How are we going to deal with the issues of land fragmentation, tribal land, tenure laws and relationships, to see what's the takeoff point? How many acres? We're looking at five to nine right now.

And another point – I know I’m throwing a lot at you, but I’ve been waiting to unload this stuff. I just got back from Uganda. We live there permanently. I’m overcoming jet lag. If I ramble too much, kick me and maybe I’ll wake up a little more; don’t do it too hard, please.

But the issue is – we have to look at the development of market infrastructure. We have to realize that biotechnology in and of itself is not the wonder thing that’s going to save Africa. If we increase yields 2,000 percent of corn, we can drop the price 98 percent inside of 30 days, and nobody is going to grow any of this stuff the next year. We have to look at the balance of developing market infrastructure, that places the farmer in a more direct relationship, and commodity exchange, such that the actual overall rural incomes are going to increase and that we can also sustain higher equilibrium price levels.

For instance, before we start talking about crop subsidies – I kind of go wild on this. I personally think that’s a phantom issue. We don’t have the developed market infrastructure in Africa; we can’t even compute price variables to determine the overall impact of the international prices on wheat and corn. Quite frankly, corn has gone up by at least 200 percent, in the places I’m looking; farmers are making money off of corn, despite increases in subsidies.

So the issue is that: One, Africa, if it’s going to develop biofuels, has to develop a market for domestic consumption. Two, the thing that scares me – well, doesn’t scare me but I’m concerned about, government intervention. This is my last point. How do we ensure, if we get into subsidization of enterprises, that we don’t have the politicization, such that we have built-in biases that are going to sustain subsidies that do away with the disincentives towards upward mobilization? We need not look, necessarily, at small-scale enterprises, though, that’s been the trend.

But what we found is we don’t see the production theorems work out right, that we’re getting the profitable production of income, labor and overall product, particularly at a volume output that our marginal costs are going to be low enough that we’re going to compete with petroleum fuels.

We say we want to break the back of petroleum fuels eating up 50 percent of African GNPs. That’s true – these people are getting screwed royally. Americans think they’ve got a problem? Africa is dying because of it. And we need to see that element of optimality that we encourage the development of optimally scaled enterprises that can give us the output of product, produce the jobs, and increase incomes. This is a multi-headed hydra. And I’m sorry, but these points have got to be addressed at a more economic-developmental holism. What do you have to say about that? [applause]

Geoffroy

Chris.

Policinski Maybe just a quick one before I answer them. First of all, Paul, thank you for your involvement in international development and to the degree you've been involved in some Land O'Lakes projects. Thank you. I marvel at the wonderful work and the hard work and the dedicated people that are part of our International Development Group. And we've got Tom Verdoorn, who is our vice president of our International Group, sitting over here. So my first comment is thank you.

Beyond that, I don't think I can address many of your questions, but I will make two general comments. Your questions point to the fact that this really isn't a debate or an issue, it's an issue or debate that has many different facets that we have to deal with. And I think you point that out very well. The issues Africa is facing are different from the issues that we see in other geography, and we have to recognize that.

The other thing I'll comment on without addressing any of your specific questions – because you had a lot in there and I'm not sure I'd be capable of even coming close to addressing them – is I think just your questions themselves point out and underline: Before we can engage in a fact-based discussion, we have to understand what the questions are. What we need to do is engage folks like you in the right areas to formulate the right questions, prioritize them, and then get about answering them. And you had a series of questions there, and I'm sure that we could go through that process.

But I think you're pointing out how many facets there are to this debate, and we've got to understand the questions first and then get about answering them in a rational, fact-based forum that's void of emotion, void of other agendas, political, personal or organizational, because the stakes are just plain too high to inject any of that other stuff.

Geoffroy Thank you, Chris. I was told that we need to close the session by 4:25, which is now the time. I want to thank our speakers, Dan Sullivan, John Powell, James Greenwood, and Chris Policinski. I want to thank our questioners; thank you for your interest and for listening. Let's give a round of thanks to everyone.