

2007 Norman E. Borlaug/World Food Prize International Symposium
Biofuels and Biofoods: The Global Challenges of Emerging Technologies
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SESSION IV. FUTURE SCIENCE AND POLICY CHALLENGES

October 19, 2007 – 10:00 – 11:30 a.m.

Moderator: Margaret Catley-Carlson

Speaker: Suzanne Hunt

Ambassador Kenneth Quinn

President - World Food Prize Foundation

I'm so pleased now to be able to continue with our morning session and introduce to you a member of the World Food Prize Council of Advisors, the Chair of the Global Water Partnership, and the former President of the Canadian International Development Agency.

Margaret Catley-Carlson is actively involved in international freshwater governance, health, agriculture, environmental protection and development. And I know every time I communicate with her, it's an email from another international conference that she's at, if not Stockholm, then China or someplace around the world. So she is really connected.

She is the chair of both the Global Water Partnership, in work that links thousands of water management professionals around the world, and the International Center for Agricultural Research in the Dry Areas (ICARDA) in Syria. She is also a member of the U.N. Secretary General Advisory Board on Water and chair of the Water Resources Advisory Committee for Suez/Lyonnaise of Paris.

And her professional career has included terms as President of the Canadian International Development Agency, Deputy Director of UNICEF, Deputy Minister of Health and Welfare of Canada, Chair of the Geneva-based Water Supply Sanitation Collaborative Council, and most importantly, on the World Food Prize Council of Advisors. Maggie.

Margaret Catley-Carlson

Chair, Global Water Partnership

World Food Prize Council of Advisors

Thank you and good morning. What an exciting ride we have had at this meeting. We started off in the evening when we went around and looked at all the various companies and what they were offering, what they were talking about for the future, and this was extraordinarily exciting. And then the next morning we had three countries or four countries – India, South Africa, China – saying, yes, but these are the kind of dilemmas it raises for us.

And then in the afternoon we had four people, men talking about the brave new world that they could see in terms of what they can offer as efficient, exceptional, science-based entrepreneurs. And then this morning we had people saying, “Yes, but...,” “Yes, but...there’s a real world out there.” And when you try and articulate that into the real world, it looks a little different.

And then we ended up on a great idea of, “Look, if you use a slightly different technology, you get different solutions.” So it’s been an exceptionally good rollercoaster. And I think that’s how it should be. We’re looking at something new – we’re pulled up, and then we’re pulled down into reality. And I think that the rollercoaster will continue with this very good panel here.

What we’re going to be talking about is whether biofuels will further or hinder the efforts to assure the sustainability of agricultural production and what the real world issues will be as we move, as we’re obviously not just on the cusp of doing but in the real world of doing, into a real world of a new industrial process that will have an enormous impact on all of us. Some industrial processes do, others do not. This one clearly is going to.

We have three panelists that have very different views of things – right from whether you can put gas and diesel into a school bus to how this is going to affect whether the world can feed itself with the available water to how this looks from space in terms of regions on the earth. So that’s about as good a scope and scan as you could possibly get.

Our first speaker is Suzanne Hunt. Her background in this comes from convincing the family farm that there was a potential in biodiesel. She has worked with Worldwatch. She’s talked to as many people as she can get her hands on, both in person or through CNN, UN, other intermediaries.

She is somebody who is passionate about the science basis of these things, but she also got on a bus and drove from Washington to Costa Rica in a truck powered by biodiesel and waste grease. So she’s a person who obviously puts a deep intellectual knowledge into some very real-world convictions about this. So I don’t want to take anymore of her time. Please welcome Suzanne Hunt.

Suzanne Hunt

Consultant, Natural Resources Defense Council, UN Food and Agricultural Organization
Global Bioenergy Partnership, and Inter-American Development Bank

Thank you. It’s funny. I actually didn’t tell that many people about that trip, thinking it would ruin my credibility, but it somehow got out, and people love it, so now I’m just working with it.

I wanted to start out by thanking the organizers for inviting me but also I wanted to specifically thank Frank Swoboda and Judith Pim, who are the two people that you might not have met who have been running around, orchestrating this whole event. So could you stand?

Now, most of my interaction was with Frank, and it's funny – always over the phone and on email back and forth, and, you know, I think many of us in this modern world, that's how we interact with many of our colleagues. And I, for one, develop these images of people in my head, and so through all these interactions I had this image of Frank as this big, tall guy, maybe 55, grayish hair. And I met him, and I thought, "My God, this must be how people feel when they meet me." So, it's been a pleasure interacting with everyone from the World Food Prize, and I'm very pleased to be here and speaking about an extremely interesting and extremely complex issue.

And I think one of my colleagues from Sweden summarized it best. We were all at an IEA, an International Energy Agency, Task 40 meeting on biofuels in Brazil. And it was one of these three-day meetings where it's breakfast, lunch, dinner; all these big brains discussing these issues. And then on the last day at the summary session, the Swedish guy raises his hand and he said, "So I think what I've concluded from these three days is that biofuels are the cause of all problems and the solution to all problems." And I think that is quite a brilliant way of summarizing where a lot of the discussion is at right now.

So as Margaret mentioned, as many of the speakers have been, I am also from a small farm, although the farm is in New York State. Many of the Iowans like to give me a hard time and say, "You guys have farmers in New York?" But, yes, we have farmers in New York. And, yes, it's been a long process, but we're finally using biodiesel in our old tractors.

And, actually, a lot of the discussion, a lot of things have already been said. It's always a challenge to speak late in a conference like this. But one of the things we haven't talked about is the health benefits. And, actually, my first thought when I learned about biodiesel was that, you know, diesel has 40 different carcinogens, like sulfur, particulate matter, all kinds of these horrible things that cause horrible sicknesses. And we drive around 35-year-old tractors on the farm with smokestacks – we just breathe in directly these emissions. So that was one of my first thoughts when I heard about this stuff.

Anyway, so with so many things having already been covered, I think what I'll do is just give a couple points on basic context that we're talking about, a couple points on some of the unknowns, and a few words about innovation. And then I'll show some pictures from my trip across the U.S., Mexico, and Central America, just to highlight some of the low-tech solutions, since we've been so focused on high-tech. So I'll just show some of the projects and businesses that we visited.

So in terms of basic context, I think that it's important to remember that, currently, transportation is responsible for producing about a quarter of the world's energy-related greenhouse gas emissions, and that percentage is increasing. So when we talk about cars and talk about transport, we have to remember that this is one of the areas that is the most difficult to deal with in terms of dealing with our greenhouse gas emissions. We've made progress in electricity, we've made progress in industry, but the transportation sector has really been eluding us.

Currently, biofuels supply, despite all of the rapid, rapid growth and excitement, they currently supply about 1 percent of our transport fuels. Ethanol is produced in much, much larger quantities right now than biodiesel, but biodiesel production is growing even faster than ethanol.

Just a couple comments on the many unknowns right now. We discussed yesterday the potential impacts that biofuels will have on food security. And right now we have a lot more questions than answers. The FAO, with funding from the German government and collaborating with many international organizations, is just getting up and going with a major initiative looking at the impacts of biofuels on the poor and looking at the impacts on food security. But there are no answers, no results yet; they're just getting going.

Another and really, really important point that I think was mentioned yesterday once or twice is that we don't know what the impacts of climate change are going to be on agricultural production. So here we have the biofuels industry coming into this world with many systems already under stress, many of our systems already not working for the poor and for the hungry. And biofuels come in and add pressure. And so the unknown, without knowing what the impacts of climate change are going to be, it just adds another layer of complexity.

We also don't know how the carbon markets are going to expand and what their impacts are going to be on biofuels production, so that's another key thing that we need to keep our eye on.

I think our colleague Andrea this morning covered many of the environmental and social issues very, very well, so I'll just highlight her comments about carbon emissions from land conversion. And that's one of the most important things that I think is left out of a lot of the discussions. So when people stand up here and they give figures saying that, you know, Brazilian ethanol has a 9-to-1 energy balance and X CO₂ reduction in corn gives you a 20 percent reduction of greenhouse gas emissions – generally, the studies they're citing are not counting the carbon emissions from land conversions. And part of it is because it's so difficult, and many of these impacts are indirect, so it's difficult to count.

But as Alex Farrell, a colleague at Berkeley, pointed out – To assume that the number that we should allocate to emissions from land is the worst possible number that we could give, because we know that there are impacts and we know that there are massive, massive carbon emissions when we take a natural habitat and convert it – both carbon emissions from the soil but also carbon emissions from the biomass. So I just wanted to stress that issue.

As John Powell from the World Food Program pointed out yesterday, biofuels are adding pressure to these systems I already mentioned.

I guess I also wanted to stress just how complex this is, and actually some speakers this morning have stolen a little bit of my thunder on this point, thankfully, because yesterday I think we had a lot of good discussion, but also a lot of the comments really did ignore some of the complexities that we have to deal with in this new industry. And I think that we do the planet a great disservice by ignoring those complexities. And indeed as scientists and businesspeople and policymakers, that's our job. It's our role to understand these complexities and to figure out how best to deal with them.

So a few points on innovation. And one of the things that occurred to me – several of our speakers yesterday talked about the massive increase in energy demand by 2030, and Melinda mentioned it again this morning. And the IEA projections, the IPCC projections, all of their base-

case scenarios, their business-as-usual scenarios, paint a very dark future, and that's not a future that I want to live in.

So I would hope that we could start not assuming business as usual and make damn sure that we don't follow business as usual. And, actually, Mr. Holliday this morning at breakfast said that we need to completely change how we do everything, and I think that's a very, very bold statement and a very correct statement. And I'm glad to hear it coming from a head of industry.

So to give a few examples of some innovations that I'm keeping my eye on and hoping to see more of, much of the discussion is about how we supply more energy to meet this growing demand, but actually I think most people will agree that dealing with energy supply on the demand side is actually usually the most cost-effective way to deal with the supply problem. And it should at least be one of the first solutions that we look to. So it's not sexy, but often efficiency is really the best.

I wanted to respond to something Andrea said this morning. She said that biofuels are not win/win, and I actually think there are many cases where you can find win/wins; you just have to be a little craftier and try a little bit harder.

And one example I would highlight is there are some folks that have been looking at wastewater treatment plants, and they grow these massive amounts of algae in the runways, and literally some of these plants in the United States have been landfilling this algae, and these guys are taking this algae and turning it into energy. So they're cleaning wastewater, they're producing energy, and they're dealing with a waste problem. So you get a win/win/win. And probably there are some other wins in that. So there are some really interesting things, and we heard from our Danish colleague this morning about some interesting next-generation technology.

I wanted to say a few words about prizes, since this is a prize-focused event. In the auto and biofuels industries, we're starting to see some – not recognition prizes like the World Food Prize but inducement prizes. I don't know – how many people remember the “X Prize”? There was a competition a while back to create a commercial space vehicle. It was huge – it got enormous press all over the world. It was all over television, thousands of news stories, front pages; it was incredible.

And now there is an Auto X Prize. There is also going to be some other prizes focused on water, land and fuels. And basically a lot of the people that were involved in that competition said, “You know, that was a great competition; you know, we didn't even have to spend money on PR and public education and outreach. It advertised itself.” But let's focus on the problems on this planet. So now we have an Auto X Prize, we have some of these other prizes, and that's the kind of innovative thinking that gets me excited and makes me think that we really can rapidly change our products and how we do things. The original X Prize – the \$10 million prize money – leveraged \$100 million in investment. So prizes can be quite a powerful thing.

Innovation in the auto industry – we've been talking about the fuels, but we haven't talked a whole lot about the auto industry. It's interesting – I spend a lot of my time traveling around, showing my carbon impact from airplanes. It's a nightmare, but we can offset.

But I spend a lot of time in Europe, and there's always talk about biofuels. But if we just caught up with Europe's average vehicle efficiency, we would halve our fuel needs. And this is not using advanced technology; this is not reducing our quality of life. This is just driving more-efficient cars.

And when I talk to the guys in the car industry and say – “Why can't we get efficient cars on our roads? You produce them in other countries.” And they say, “Oh, we can't. We produce what the customer wants. You know, we can't produce... We're just producing what they want.”

And one of my favorite quotes of all times is from Henry Ford, and he said, “If I had asked what people wanted, they would have said, ‘Faster horses.’”

So we need to be thinking. And it's especially interesting with the car industry because cars traditionally have been the symbol of mobility, personal expression, movement, choice, independence. And now we've gotten to the point where they're so ubiquitous that they're actually limiting our mobility and our choice. We sit in traffic jams, they're polluting our air, and they're threatening the planet with their greenhouse gas emissions.

So I think that we really need to be pushing the auto industry, and governments need to make these industries evolve. And they need to be, instead of focusing on the individual car, we need to be focusing on what we really want, which is high-quality, low-carbon transport.

I work with some folks at the art center in Pasadena, and I just help a little bit, but they have started doing a sustainable mobility conference every year. And the first kickoff summit was last year, and it was amazing. These designers were absolutely incredible. And the thinking was that here are these brilliant guys, but they are spending their time making things look sexy, and they don't know about sustainability issues, they don't know about climate change, they don't know about our energy crises that are on the horizon.

So the idea was to train these designers in sustainability issues. And the things that these guys were coming up with are absolutely amazing. So I think we really need to be orienting towards what we want and not picking how we get there.

And that's actually a nice segue into my next point, which is in policy innovation. At an industry conference a couple weeks ago in Europe it was interesting to hear a lot of the industry reps saying that there are significant technical challenges, but really the difficult challenges are the policy challenges, the people challenges – that's really the hard part. And I think that we've probably all had similar experiences.

I was asked to say a few words on the evolution of sustainability policy. And right now – I won't go comprehensively through all the different things that are happening but just highlight a few of the more interesting things that are happening.

In Europe – led by the UK, Germany and Holland – they are now tying mandatory sustainability performance requirements to their biofuels policies. So when Europe put a blending mandate in place, we started seeing increased pressure on the rainforests in parts of Asia and a number of other ripple effects.

And the European public spoke out and said, “This is not acceptable. We don’t want to be creating enormous greenhouse gas emissions in another part of the planet, so we can displace a little bit of fossil fuel in Europe.” So they decided that they were creating a market in Europe for these two if they had to tie sustainability standards to them. So that’s one strategy that’s being put in place.

More broadly, I think there are a number of efforts underway to create sustainability standards on a global level. Probably the leading multi-stakeholder forum is housed in Switzerland, and it’s called the Roundtable on Sustainable Biofuels. So you can go online if you’d like to engage in that.

The GBEP that was presented by Gloria Visconti yesterday is also another forum, and that’s government. The Roundtable on Sustainable Biofuels is industry, it’s NGOs, it’s a number of different stakeholders. And right now GBEP is principally led by governments. So hopefully we’ll be able to figure out the best way for those two fora to interact.

But I think the bottom line, and hopefully the take-home message that I’ll leave you with, is that these strategies all need to be more integrated – and I think we’ve already heard that in our conference – more integrated and more focused on where we want to be. And I think biofuels need to be positioned within broader development strategies and broader transportation and energy strategies.

And we heard this morning from Mr. Holliday that there will be many solutions and not one. And so I think in terms of positioning the industry and building public support and building appropriate policy frameworks, it’s best to do that as part of these broader strategies.

Just a couple of words on development, and we’ve covered very well this morning already, so I’ll just be really brief.

I don’t know if anyone has said it directly, but energy is absolutely essential for development. So much of this focus on biofuels for transportation has actually, as was pointed out this morning, kind of diverted our attention from many of the really interesting – and already many of them are very cost-effective – ways of using biomass.

A couple of interesting points. Women would have a lot more time to spend towards food production and gathering if they weren’t spending a third of their productive lifetime, in the poorest countries, gathering wood for cook stoves. The smoke from cook stoves is one of the leading killers in the developing world.

So many of our colleagues from Gates are here, and we’ve been discussing the Gates initiative in agriculture. So if Gates is going to put a huge amount of effort into looking at improving agriculture in Africa, for God’s sake, look at integrated energy and agriculture, and then you’re dealing with two of the core needs in development.

And look at crops that provide energy and food. Sweet sorghum has been mentioned where you use the grain to feed people, you use the sugar and the stalk for ethanol. And if you can take the biomass off the land, use some of the stalks to burn for electricity. And we’re just

really scratching the surface with some of the possibilities that are out there with intercropping and these new crops.

So now I will just switch gears and talk about some of the low-tech options that I encountered in my trip. And just to explain a little bit, I was leaving the Worldwatch Institute, and I had lots and lots of vacation time that I was going to lose, and I was approached and asked to come on a trip, driving from Washington, DC, to Costa Rica.

And actually this kind of road rally had started in Europe and Africa as a spoof on the Paris-Dakar Rally where they spend millions of dollars driving Landrovers through some of the poorest parts of the planet. So this group of Brits decided, "Let's do a spoof, let's spend no money on the cars, and the challenge won't be speed, it'll be just getting there in these junkers, and we'll raise money for charity."

So they did it a few times in Africa, and they drove a bus to Chechnya full of supplies, and this year they wanted to do a test run in the Americas with a biofuels theme. So I got roped in as the biofuels person and helped them set up visits, and it was very, very interesting. And there was a film crew, so if you ever want to get over your fear of cameras, just have a film crew follow your every move for a month – very interesting.

So the cars that we drove – old junkers – we decided, you know, what biofuel can we get anywhere between here, between Washington and Costa Rica. Well, we figured we could get waste grease anywhere. So we drove old diesel cars. We had the regular fuel system in them, and then we added a grease system. So you just have a separate tank, you have a heating element, you have a few tubes that take the fuel from the tank to the engine, and in between you have just a fuel filter with a heating element around it, because the grease is a little bit thicker than the diesel, so you have to heat it up first. Except on days when it's so hot that you're melting, and then it doesn't matter.

And this is just showing you that the tank in the Mercedes is in the back. I just had plastic jugs. My system in my little truck was just homemade, so it's plastic jugs and materials that you can get anywhere in the world.

We stopped in Texas on the way to visit some of my fellow board members at the Sustainable Biodiesel Alliance, and their plant in Texas uses locally grown cottonseed oil, and they sell to truck drivers. And they're business partners with our favorite celebrities, Annie and Willie Nelson. You probably – the first thing that comes to mind is that Willie likes to smoke biomass, but he's been a very, very powerful spokesman for clean fuels and supporting our farmers. And when he speaks, a lot more people listen than when I speak, so it's been a very effective partnership. And they've really been driving a movement in the U.S. to develop sustainability standards for biodiesel.

So Mexico, it was Semana Santa [Holy Week], so we didn't get to visit anyone in Mexico. But when we got to Guatemala, in Guatemala City we visited – this large picture, it's kind of this hodgepodge plant put together by a young chemistry professor and his students. So they were taking waste grease from the city restaurants and making biodiesel.

Nueva Alianza is a community in rural Guatemala that we visited, and this is a really interesting development model actually. They are a cooperative of 40 families. They already have a profitable water purification business and were starting an ecotourism business. An American taught them how to make biodiesel and helped them get funding to build a small processor. And so they were, when we visited them, just collecting restaurant grease but had planted some jatropha and had planted some other crops and were experimenting with how to integrate oil seeds into their farms.

And right after they got their processor up and running, a hurricane came through, and they weren't able to get diesel for their generators for a number of weeks, and they had their biodiesel. And they said they were very nervous using it in their generators, but they didn't have any other option. And it's been working beautifully. So this is them trying out their generator, and it's just more of their equipment. And you can see that this is low-tech; it's materials that are largely available all over the place.

So this is another farmer that we visited. The top left-hand picture is a living fence – a jatropha fence. That was an enormous fence surrounding a rubber plantation, but jatropha is native to Latin America, and one of our colleagues yesterday highlighted that we don't know what the yields are going to be with jatropha. And one of the problems is that there hasn't been a crop development initiative for jatropha, so the germplasm they're getting is literally taken from fence rows.

So a lot of this is experimental, but this farmer was planting these jatropha cuttings on the edges of his cornfield where he said usually it's just brush and he doesn't use it. Some of his neighbors were planting it on abandoned land. So they were experimenting, and they had some support from a development agency.

And it really is an incredible plant. We got there ten days after he stuck those cuttings in the ground, and there were already – I wish I had a closer picture – there were already leaves sprouting, so it's interesting to see that it's really everywhere.

Now, switching from the small-scale to large-scale, this in Empacador Toledo in Guatemala City. And these guys are the guys that process all of the meat for one of the huge fast-food chains in Latin America. I don't know if folks know Pollo Campero, but this is the guy that designed the system.

And they had a year of experimentation, and they tried things that didn't work, but they had worked out all the kinks by the time we got there. And they were using a small fraction of their pork and chicken fat and producing about 30,000 gallons of biodiesel a month and running 200 of their delivery trucks on different blends. And before that, you know, they were right in the city, so they were sending a lot of their waste to the landfill. So this is a nice win/win/win story.

I'm running out of time. I didn't see that person in front of me with a stop sign. I'm almost done.

So Honduras is the last couple stories I'll tell you. We visited of palm oil plantations. This is my favorite picture to show the importance of the type of energy used in processing. They were using diesel but are going to switch to burning palm kernels.

Let me just fly through. Here's – they have biogas. It's been mentioned a little bit, but they were taking all their wastewater, running it through this biogas collection facility, burning the biogas to run the plant. They've sent the water down to evaporation ponds and at the end had a nice fertilizer to sell. They had carbon credits, so it was all very financially viable.

Here's another palm plantation. These guys were taking their low-quality palm oil that didn't meet the requirements for food and were turning that into biodiesel, displacing some of their diesel use.

We visited also in Honduras the largest tilapia fish producer in the world. They are sending huge jets full of fish to the United States every day, and they were taking the fish fat. The CEO spent an entire day with us. He was so excited, and he said that they spent half a million dollars on a fish waste processing plant, so they took the protein fraction and made fish meal for animal feed and they took the fat and made biodiesel. They are displacing all of their diesel fuel needs and also selling low-cost fuel to their employees, who then go out and educate the community about the fuel.

Horses and donkeys, also biomass powered but a little bit slower. This is night in Nicaragua. Costa Rica is where we ended, and there's lots of different entrepreneurs there – but their constraint is feedstocks.

Thank you very much.