Afternoon Session

I N D E X

AFTERNOON SESSION

1:10 p.m.

DR. JENKINS: -- enjoyed your lunch; I hope you actually got lunch. I understand we ran out a little bit there. Is there anybody who didn't get lunch who paid for it?

I'd like to go ahead with the afternoon session. I do want to remind you that we will have some question and answer period later in the afternoon. Actually there will be an announcement a little bit later on. We have one speaker who is not coming in, is that correct, towards the end of the program. Anna Halpern-Lande will unfortunately not be able to be here. She's sick today. We're going to open up the question and answer period a little bit early. So actually questions during the first session will be deferred to that later afternoon question and answer period. So we'll actually have question and answers for the two sessions this afternoon at the end of the second session.

It is my pleasure to introduce the next speaker. This is Deputy Secretary for Energy in the California Resources Agency, Joe Desmond. Mr. Desmond was appointed by Governor Schwarzenegger,

if I can get my mind in gear here, Governor Schwarzenegger to have responsibility over managing all of the energy policy across the state agencies, working with the federal government and with neighboring states on regional cooperation. Basically advising on all the energy matters for the state.

Mr. Desmond has a lot of experience in industry, as well as government. He was President and CEO of Infotility, Incorporated, an energy consulting firm. And also in software development. And a board member of a number of things. I really don't -- I had the pleasure of actually speaking at a seminar that we had back on the 14th of December for Mr. Desmond, discussing various energy issues and especially the biomass. That was really a pleasure to hear what he had to say there and talk about integration in the state and the agencies working together.

And so without further ado, let me do introduce Deputy Secretary Desmond.

(Applause.)

DEPUTY SECRETARY DESMOND: Can everybody hear me okay in the back? Super. Well, let me welcome everyone here this afternoon and say it is

a pleasure to speak to you today on something that is actually quite near and dear to my heart, and that's biomass.

And the reason for that is much like you have in other industries, it represents what you would call a virtuous cycle, in that it is truly the embodiment of sustainability when it comes to developing policy that something can be recycled, reused and generate power, electricity, then be replanted, for instance, to capture carbon, which is then released once again, and repeating that cycle all around.

So the area of biomass, we talk a lot about renewables here in the State of California. We talk about wind; we talk about solar; we talk about geothermal; we talk about hydro. But I think it's high time that more time and attention is spent focused on the subject of biomass. Because it really is reaching the point where it can play a significant role in helping California meet the state's renewable energy standards.

What I'd like to do today is just briefly talk a little bit about some of the things that are happening. One, at the federal level. Two, what the state is doing relative to biomass

and how biomass fits within the Governor's energy policy priorities. And then also conclude with some remarks about where we think we're going to go in this subject area.

So, first off, let me just indicate I think most people are probably aware that on a nationwide basis renewable energy represents about 9 percent of the energy generated in the U.S. Of course, if you back off hydro, it represents today 2 percent of what that is. And I'm sure, as many of you have probably also read, the State of California has a commitment to achieve 20 percent of its energy through renewable resources by 2017. The Governor has declared his intent and support to accelerate that date to 2010. So that is the state's goal, 20 percent renewable portfolio standard by 2010, with an eye to saying how do we go beyond that, perhaps to 33 percent by 2020.

So, clearly the State of California is strongly committed to the use of renewable energy.

As I said, on a nationwide basis, if we look at the national level about what's being done, I know that today there was a report I just received from the Bureau of Interior, the renewable resources for America's future, talking

about all the things that they intend on doing in the area of renewables. And more specifically, biomass.

In that sense what the Department of Interior has done is to establish a biomass initiative, working together with the Department of Agriculture, the Department of Energy and the Department of Interior they are looking to address the risk of catastrophic wildfire on federal lands; they have signed an MOU between the agencies.

And just as an example of some of the things that they are doing, they have an interagency woody biomass utilization group, still informal, but meeting regularly and working on a charter.

They have work being done on new standard contract provisions around the delivery and use of biomass resources available, -- make cooperative agreements with the National Association of Conservation Districts, and the Bureau of Land Management is developing and refining its biomass utilization study.

So then the question is, what's California doing. Because California always likes

to lead in the areas of things like energy efficiency and renewable energy.

So what I wanted to do is draw your attention to two things. First, there is an upcoming report that will be issued, and I have to give credit to the folks at the California Biomass Collaborative, the California Energy Commission, certainly the California Department of Forestry and Fire Protection, and Mr. Bryan Jenkins for what is soon to be released, The Biomass in California, Challenges, Opportunities and Potential for Management and Development. And so this is a very thorough comprehensive study on what that opportunity is in the state.

Again, let me relate to you how biomass fits within the Governor's what I'll call the ten point electricity policy priority.

I had indicated earlier that biomass represents a virtuous cycle because it generates a useful product in the form of heat and electricity and energy, but it's also being recycled into the environment, whether that's through municipal solid waste utilization, and carries with it many many different types of benefits.

We have to, as policymakers, create an

environment that is conducive to the development and growth of an industry. And specifically that means what are we doing to create an environment conducive to the growth and development of the biomass industry.

Well, as I said, the Governor does have a ten point plant for addressing energy needs. And those priorities I'll walk through and relate how biomass fits within each one of those. Some of you may have heard some of this before; it may be new to some of you, but I think it is important to understand how this fits in that context.

The number one priority that California faces today is something we call resource adequacy. What does that mean? It means having sufficient planning reserves under a one- and two-year weather forecast to meet maximum demand.

Now, there are a lot of rules being done and being formulated at the Public Utilities Commission. This is something that was adopted last fall. They are working towards a capacity market. For those of you who are in the biomass development business, that does mean that there's an opportunity for a capacity payment, to the extent it's qualified and deliverable. So we

think that's important.

But more importantly is that biomass has the opportunity to add to the mix of diverse fuel resources. And more importantly, oftentimes this can be sited in some instances where it is deliverable to the load. So biomass, itself, and bioenergy opportunities clearly tie back to California's number one priority.

Quick rule of thumb, most people don't often think about this, but California has a huge growing appetite for energy. Clearly we invest a lot in energy efficiency. I'll talk about that in a moment. But I want you to keep in mind that as a state we have to add, based on a 2 percent historic load growth, on average, net of retirements, about 1000 megawatts of new capacity each year. So think about that.

In the next 20 years that's going to represent 20,000 megawatts plus the expected retirements that can range anywhere from 5000 to 10,000. You can begin to get a sense of the magnitude for what California's going to need to do to bring energy and specifically 20 percent of that being renewable energy at a minimum, into that mix.

So the market opportunities are there. And hopefully we're communicating those price signals. But I just wanted to give you a sense of the magnitude of the challenges we face as a state.

The second priority, then, is in the area of transmission. And quite simply I could say that California has suffered from a chronic under-investment in transmission infrastructure over the last 15 years. And so the emphasis today then is quite simply more is better. And by that I mean we have to upgrade to reduce congestion costs; we have to look at interstate transmission. But in order to support the types of biomass and bioenergy products we need transmission policies that enable developers to connect those systems into the grid.

On a small scale we need to make sure the policies allow for that interconnection to happen in a quick, acceptable manner. And that the policies also can be used in a very small scale, with distributed applications such that we're not advocating what we'll call perverse insensitives, and that would be assessing penalties where otherwise a project is

contributing to help meet California's growing energy need.

So, you talk about transmission and the policies, recognize also that the risk of transmission failure oftentimes is tied to fire, as we saw last year with the spread of forest fires. Any, again, opportunity that we have that can help thin those forests and reduce that risk of catastrophic fire helps to contribute to improving the overall reliability of the transmission network.

The third priority then, resource adequacy, transmission, the third priority becomes in the areas of rules on wholesale energy procurement. And there's actually been quite a bit of work that's been done. What the Governor called for was an open, transparent, competitive procurement process. In other words, utilities would submit a plan, and then any contracts they entered into or power plants that they built subject to an approved plan would be assured of that cost recovery.

So there's this expectation, then, of a demonstration of prudency on the front end. What does that mean for biomass? It means that we have

a number of additional rules incorporated into that mix. The PUC did adopt the use of a greenhouse gas adder in order to help assess the potential risk of future carbon regulation.

That ranges, I want to say, somewhere between $16 and $30 -- 24, I could be off on the figures. But nonetheless, as the utility goes out and evaluates, all things being equal, you would look to a renewable resource. And so, again, the types of policies we're putting in place are designed to encourage that.

On the other wholesale procurement, certainly as a state we want to support efforts at the federal level to extend the production tax credit for a long period of time to all renewable resources, including geothermal, biomass, wind and solar.

And so as we look at these rules what do we expect to come out of this? Well, we look to the utilities to identify those requirements using a least-cost, best-fit methodology. But more importantly, they have to look out for a longer period of time and then identify those needs.

And as we move that requirement for an RPS up to 2010, it means, quite honestly, that it

increases the opportunity as well as the pressure to comply by identifying what are, in fact, viable technologies that we should be looking at to help meet that 20 percent renewable portfolio standard goal.

So, in the top three priorities alone you find that again, the conditions and the environment is very positive towards the development and growth of the biomass industry.

Number four tends to focus on how do we increase our sources of natural gas supplies. Now whether that's instate gas production, new pipelines, or imported natural gas, the fact is that biomass, as a renewable resource, helps to mitigate against gas price volatility. So, once again you see the connection back to the state's priorities when it comes to renewables.

In the area of number five is rate relief. That really focuses on making sure we get the maximum benefit out of the DWR contracts, renegotiation, as well as FERC refunds, stemming from the electricity crisis. I can't honestly say that biomass is a huge contributor to that problem, so that's the one area where it probably doesn't fit easily into my little ten points here

today. But nonetheless, it is a priority for the Governor to make sure that rates in California are competitive, and it helps our economy and the creation of jobs.

In the area of energy efficiency the state has led by example across this country. It will continue to do so. We have a number of initiatives in that area again that create opportunities for biomass. Specifically the Governor was a sponsor of a resolution at the Western Governors Association back in June of 2004. That resolution calls for the identification of policy options around the development of 30,000 megawatts of clean energy in the west, as well as a movement towards energy efficiency.

I indicate it here because again we have formed a clean and diversified energy advisory council consisting of 29 members representing both industry, as well as the states. They are now breaking into different task forces and they're working at crafting those types of policies. And biomass and biopower, biofuel opportunities will, in fact, make their way into those recommendations that ultimately will go back to the Western

Governors Association in June of next year.

Renewables. I think probably moreso than any other state in this nation this Governor has led the way by indicating both economic growth and environmental improvement can be pursued at the same time, simultaneously. They are not mutually exclusive options.

And so in that sense we have a goal to move to this 20 percent by 2010. We are backing legislation this year to do that. We're also looking at the use of unbundled renewable energy credits. So, again, for those developers that have them, we want to make sure that those are sited, and eventually that those have the opportunity to satisfy requirements across not just California, but the entire west.

And in that vein the State of California, through it's Energy Commission, has been funding the WREGIS program, which stands for the Western Renewable Energy Generation Information System, WREGIS, which is an accounting mechanism for registering and then retiring renewable energy credits. So, once again, it's another example of where biomass can have a role to play in that mix.

I don't want to ignore for a moment here the opportunity in the transportation fuel sector. The 2004 IEPR update, the Integrated Energy Policy Report the Energy Commission has identified, looks to and seeks to identify a series of recommendations, as we think about how to deal with the growing demand for petroleum, or alternative petroleum products consistent with the state's approach.

Number eight, we have as a policy priority is reopening retail competition from large users. But I want to be careful about how I put that in context. That is provided that the two conditions are met. The first is that there's no cost-shifting; and secondly, that we're not creating a new stranded assets.

But I think you will find that in the area of competitive markets there is a strong and growing demand for green power. And oftentimes you find that in the area of community choice aggregation where certain cities look to procure 50 percent of their power as being green.

So what do we need to make that happen? We need a mechanism for tracking, insuring and certifying that they have the confidence that

they're delivering and paying for a product that they're getting.

But more importantly it's that choice that helps to influence and shape and drive the market. And so where there are retail sellers of power that serve those types of customers, they have to find an opportunity to deliver that. And that's where, again, biomass has a role to play.

The last two, advanced metering/dynamic pricing. Why is that relevant? Well, in general we are looking to deploy advanced meters across the system for a number of reasons, not the least of which is to capture any sort of price elasticity that exists by allowing customers to make more rational informed choices about when and how they use energy, based on the price and the cost to deliver.

But also there are those types of products that operate, solar being a good example of one, where it contributes onpeak. But again, as a renewable resource, biomass in the operation of certain plants can, in fact, contribute. The net value should be reflected in the cost of energy as it's delivered to consumers.

We think there are a lot of other

benefits associated with that, as well. Benefits that speak to the ability of people to identify, aggregate, forecast, but again in that process, identify, aggregate and look to procure renewable green power. And that's an important component of that.

And then lastly, number ten, is the commitment to continue the investment in research and development, demonstration projects and technology transfer. Because if there's one thing California does well, it is reinvent itself. And there's probably no better example of that than in the Silicon Valley, where the community is capable every 15 years of finding new technologies and changing the world.

And in that sense we look at advances in biotechnology and their ability to move forward. Things that were not possible several years ago, including new organisms, perhaps, or new conversion processes for anaerobic conversion of biofuels, cellulosity conversion, looking to identify those opportunities.

And the research that goes along with that is absolutely critical for this industry to again move forward and to identify.

So as I take a step back and I look at what California's doing, I actually see a very bright future for the biomass industry, whether that's in bioenergy, biofuels, any number of the other applications.

So then what do we need to make this vision if you will, or this opportunity, a reality. Well, what I would say is that today we still have fragmented programs that led to overlapping and sometimes confusing initiatives.

There's a lot happening at the federal level. There's a lot happening in different state agencies. What's necessary and what we're doing today is forming and reinvigorating the state agency biomass working group. That will consist of the Energy Commission, the PUC, certainly the Air Resources Board, State Water Resources Board, California Department of Forestry and Fire Protection, Food and Ag, Integrated Waste Management, I think I got that. If I've left any out I'll let you know, and in fact, Jim Boyd, who was very strong advocate, Commissioner Boyd -- who's recovering from the flu that's been going around. I give him credit for being here today -- is one who I'm sure will continue to lead that

charge.

But it's time that we find a way to develop a comprehensive set of statewide policies. And so the types of things that we'll be looking to do, obviously, are to begin to identify, you know, the policy initiatives that are appropriate to move this market forward; to identify specific legislative needs, whether it's in changing definitions, for instance; or it's looking at the establishment of goals and standards along the lines of biomass; or identification of the types of credits, or giving credits so we can monetize the benefits of reducing landfill and reducing municipal solid waste.

We need a group to interface with the federal agencies. There is a lot of federal money. We read in the newspaper all the time about how California doesn't get its fair share. And so we need to identify a mechanism for obtaining that and having those dollars come back into California where, in fact, we have tremendous resources across all these areas, whether it's in municipal solid waste, forest waste and agricultural waste.

And then lastly we need a group to

inform the 2005 and on a going forward basis IEPR, the Integrated Energy Policy Report, so that, in fact, biomass has a prominent role, I should say prominent, equal to the other types of renewables, such as wind, geothermal, solar and hydro.

But I think that's where we want to go with that. Other things that I would suggest. We talked about the legislative needs and the interface. We want to identify regulatory hurdles facing the biomass development, to serve as an interface for public/private cooperation, to identify demonstration projects.

I know in talking with many of the different cities around the state that they have a very strong desire to enter into demonstration projects, whether that's on biofuels or alternative fuels or biomass and municipal solid waste conversion.

We want to encourage education and outreach so that we improve and increase the public awareness of biomass and its role as part of a sustainable energy future.

And then obviously we're going to need to work on some budget issues, but nonetheless, that is really the focus, is to reinvigorate and

breathe new life into the biomass industry here in the State of California so it takes, as I said, a very prominent role and gets the attention and opportunity I think it so richly deserves.

So, with that I'll conclude my comments, and again, thank all of you. I'm sorry I could not have been here for the technical sessions. I love that stuff. I love to read it and I do read it. But again, it's a busy schedule. So, thank you so much for your time.

(Applause.)

DR. JENKINS: Thank you, Deputy Secretary. Very nice words. I don't know if you want -- well, maybe I shouldn't ask -- do you want to take a question or two? Are there any questions from the audience? We heard a lot of things here, a lot of goals, some things directly related to the mission of the Collaborative, but a lot of other activities, as well, in the state.

Are there any questions for the Deputy Secretary? Just one or two.

All right, right here.

MR. MUNSON: Enjoyed your comments. Would it be possible to focus in on trying to see California get a substantial amount of the $760

million a year of healthy forest initiative thinning money to kick the next round of fire reduction off?

DEPUTY SECRETARY DESMOND: Absolutely. I mean I think that's when I talked about us not getting our fair share across the board, that's a good example of money available that we should be using. There is a number of good studies, both the California Biomass Collaborative has already done some pretty exciting work and others, but that is, in fact, what a task force is capable of doing, is identifying and then implementing a coordinated strategy to go and get those dollars, and get them flowing back to California.

So, again, part of this is just simply identifying what all those options are. There's a lot of places and a lot of buckets of R&D and demonstration dollars out there. And likewise, there's a lot of in-kind contributions.

I know in speaking with the Forest Service they said, look, we're happy to designate large areas, even if it helps California move this process along. So we want to pursue all those opportunities.

Yes. We'll go one, two and three.

MR. REESE: Hi, I'm Phil Reese from the California Biomass Energy Alliance. Joe, you mentioned reforming the interagency working group. What stage is that now? Is it a formalized structure? Has a letter of invitation gone out? Or is it --

DEPUTY SECRETARY DESMOND: I'd have to defer to Commissioner Boyd, because in speaking to him I know, as I said, he's been contacting the old agencies, and it's been some time. But it turns out a number of those individuals that were on the original working group have either moved on, so I'll defer to Jim to identify where those are.

But the plan, actually much like we've done for instance in LNG interagency working group, where there's not a charter, per se, but there's a regularly set of scheduled meetings and people who are assigned from each of the agencies who come and attend, and then communicate that back to the various agencies.

MR. REESE: And Jim will let us know about that?

DEPUTY SECRETARY DESMOND: Yes, he will. When he's feeling better. Not going to put him on

the spot.

MR. MOLIN: Yes, Mr. Secretary. I'm wondering how we can create in the State of California immediately a large, multibillion dollar green fund so the developers of biomass industries, people in here have been around for 10, 20 years in this industry. They made 10 cents a kilowatt hour for their power, that's what it's all boiled down to, that's what the studies say.

How do we create this green bank immediately, such as Germany has created; many other countries have already created; for the rapid adoption of anaerobic digesters, gasification processes and new waste-to-heat processes? Because that's what we need. We need the capped, low interest and zero interest loans. And a lot of money, not just a couple million or 20 million. We need a large green fund. How can we do it?

DEPUTY SECRETARY DESMOND: Maybe I'll try to answer that in two different ways. When we look at other renewables, for instance, the challenge is obtaining financing. And it's not so much the price on a delivered basis. Clearly that's on the buy side. But the risk, the

perceived risk associated with the stage of certain of the technologies and the economics of how those projects will play out over time.

So I think part of that is to say we don't necessarily have to create new funds if we can identify existing sources of money. Part of what I spend my time doing is communicating with, for instance, the venture capital and project finance community about these things.

Now, I recognize that there are, you know, that is very slow. We have done something similar in revolving loan funds in the past in energy efficiency, where we've created those. I would say that that's an idea that ought to be taken up by the working group and would probably fall into the category of, you know, ideas for potential legislation.

I don't know the exact specifics of how you'd construct or set that up, but clearly that would be one of the ideas I think is worth exploring further.

Pardon me?

MR. MOLIN: I have some ideas.

DEPUTY SECRETARY DESMOND: Great, we certainly want to hear those. Yes, sir.

DR. HUGHES: Evan Hughes, Biomass consultant. I have a question on what I think you referred to as a perverse or adverse incentive, and the same thing sprung to my mind listening to Commissioner Boyd earlier.

I suspect, maybe others would argue on this, that there's a problem with NOx regulations where biomass costs are being made higher than they need to be for a negligible gain regarding NOx reduction, where biomass cannot compete very well with natural gas generation.

And in order to forward the renewable agenda and to forward a greenhouse gas agenda, I suspect some compromise needs to be made here, which would be a regulatory coordination issue.

Is that an issue you encounter? And --

DEPUTY SECRETARY DESMOND: Well, -- whether it's, you know, digester applications and how they look at methane. These questions come up oftentimes when you have agencies that tend to have a single purpose, whether that is water or it's air. And what we have to do and the purpose of having an agency working group is to begin to communicate so that it's a comprehensive consistent policy that, in fact, is looking

towards outcome-based goals. And that is the furtherment and development of renewable energy, while at the same time pointing to or demonstrating improvements in the environment.

So that can come about in a number of different ways. It can come about through memorandums of understanding between agencies on how they're going to deal with certain issues. It can come about on proposals for changes or exemptions to different types of regulations. It can come about through trading offsets or any types of any number of credits that can be dealt with in different ways.

So, I think part of the objective here is to make sure we recognize what's the end game. And by end game I mean what is it we're really trying to accomplish. And that's we need new sources of renewable energy going to promote an industry, and we need to recognize the benefits associated with that in those tradeoffs.

I think a good example of where we can begin to do that is in the definition of what is waste. I believe that there's a bill being sponsored by Assemblyman Bogh this year that deals with some modifications to the definition of

integrated waste in order to make it easier for anaerobic conversion technologies to move forward in the marketplace. I don't have the specifics in front of me, but I certainly recognize that's a challenge whether we're dealing in energy or other industries.

So certainly something that needs to be taken up by that working group. I wish I had a better answer for you on that, but --

Thank you very much.

(Applause.)

DR. JENKINS: Thank you very much, again. Now we'll let the Secretary off the hook here, I think, because before we drain the state's bank account and answer all the regulatory issues, but thank you very much for that. These are really inspiring remarks.

And they lead directly into the technical sessions this afternoon. The first session which will be on resources and environment; and then we have another session which will be on financing and economics of biomass projects.

And I do look forward to more coming from the interagency working group and hearing

more from Commissioner Boyd at some point in the future about whether the status of that and how we can participate.

So, with that, your next moderator is Rob Williams. Rob is with the California Biomass Collaborative Staff, and he will be moderating the session on resources and environment. Rob.

MR. WILLIAMS: Well, thank you and good afternoon, everyone. Would this afternoon's panel please come on down and have a seat. We'll get started.

(Pause.)

MR. WILLIAMS: This session we're cramped for time, so we're going to ask only 15 minutes per speaker, and we'll try to have questions for this panel and the next panel after this last panel in the afternoon.

So, we're going to start off with Fernando Berton. He manages the organics material management section at the California Integrated Waste Management Board currently. He's worked at the Board in several positions since the mid '80s. And for a brief period of time he had his own environmental consulting firm.

And recently Fernando has worked with

Board Member Rosalie Mul, as the advisor. And so without any further delay let's bring on Fernando.

MR. BERTON: Good afternoon, everybody. As Rob said, and so nicely reminded me, my name's Fernando Berton, because sometimes I forget that.

(Laughter.)

MR. BERTON: I work in the organic materials management section of the Waste Board. And as the name implies, the primary objective of our section is to find ways to best manage our organic resources.

This is especially true based on the Waste Board's 2003 waste characterization study that was recently done. In that study it was determined that just over 40 million tons of municipal solid waste was disposed of in 2003.

Of that amount 30 percent of the material still being landfilled is organic in nature. This includes feed waste, leaves and grass, prunings and trimmings, branches and stumps, organic crop residues and manures. Clearly we must do something to take that 30 percent and turn it into a beneficial use in some fashion.

If all that organic fraction that's

being landfilled now were converted to electricity, you could generate over 2300 megawatts.

AB-939 required that jurisdictions insure at least 15 years of ongoing landfill capacity for California counties. At the current rate of 40 million tons per year, 15 years of landfill capacity equals 600 million tons. This much landfill material would fill a canyon larger than 15 miles long, a quarter of a mile wide, and 20 stories tall. And don't forget, 30 percent of that is still organic in nature.

This is not sustainability. These are wasted resources and the focus our efforts towards the notion of beneficial use and sustainable uses.

However, organic materials -- is just one of many important programs within the Integrated Waste Management Board designed to accomplish our goal of a zero waste in California.

Now, I'm sure some of you are wondering what is zero waste, what do I mean by zero waste. And I think the best way to explain what zero waste is would be to start by explaining what it isn't.

Zero waste isn't about getting rid of

huge piles of garbage. It isn't even about recycling every bit of garbage we produce. As it pertains to the topic of this biomass forum, what zero waste is is about using all our resources to the fullest potential, because it will become a waste if we don't use it to its fullest potential; much like that 30 percent that's still being landfilled.

Take film plastic, as an example. Film plastic, like agricultural film, is made from ethylene gas. Ethylene gas comes from natural gas. Unfortunately nobody wants to recycle film plastic.

There are processes available today that can take that film plastic and convert it to a synthetic gas which can, in turn, be converted to ethylene gas, which in turn can be made into plastic again.

Another example that's probably closer to home here is dairy manure management. It's becoming increasingly difficult to landspread manure. So we must look to new management tools. Anaerobic digestion technologies are very good examples of where you can take the manure and process it through a digesting technology to

produce the biogas to run the dairy. In turn, the residue from that anaerobic digestion process can be used as a soil amendment to grow the crops for those dairy cows. Now how's that for a closed loop system.

As these two examples illustrate, the future success of diversion throughout California should not be tied to resources -- should be tied to resources and resource management. Not waste management. Because as we all know, it's really not about waste; it's all about resources.

This is especially true as we continue to deplete our nonrenewable resources like natural gas and crude oil.

Zero waste is based on the concept that wasting resources is inefficient and that efficient use of our natural renewable resources is what we should strive to achieve. It requires that we maximize our existing recycling and reuse efforts while insuring that products are designed for the environment and have the potential to be repaired, reused or recycled.

Zero waste is about utilizing most effective processes and includes something near and dear to my heart, and that's research new

technologies and harnessing the energy potential by using new and clean technologies to convert the material into green fuel, or to produce electricity.

I think California's renewable portfolio standard is one of many steps that foster the philosophies of zero waste because it provides an incentive for increased utilization of biomass resources. But I think there's much more to be done, and that's what this biomass forum is all about.

The Waste Board is in the process of preparing a report to the Legislature on new and emerging conversion technologies that can help shift our focus from waste management towards resource management. These technologies are new and emerging in the sense that the material being converted, not the technology, itself, is new and emerging.

For example, you have gasification and pyrolysis that has been around for quite a long time, centuries, in fact. So, if a technology is not new and emerging, but the use of biogenic forces is where it is new. So in a sense it's really a maturation of that existing technology.

The success of zero waste requires that we redefine the concept of waste in our society, so-called paradigm shift. That's the title of my presentation. In the past waste was considered a natural byproduct of our culture. Now it's time to recognize the proper waste management, not waste management, is at the heart of reducing waste sent to landfills and towards a sustainable society.

At the same time certain stakeholders must also have a paradigm shift and realize that these new technologies are not the big, bad bogeyman for the environment, and have a place in the zero waste world.

The question to ponder is how do we succeed in accomplishing our goal of zero waste in California. I think a big part of that success depends on insuring that existing and proposed laws and regulations do not pose a barrier to achieving a zero waste California.

We also need to be cognizant of crossing the issues and work with all our affected agencies so that we move forward and don't work at cross-purposes.

The Waste Board has taken zero waste

initiative head on. Like any good agency does, it develops a strategic plan. One of the primary goals of the Waste Board is to promote a zero waste California where the public, industry and government strive to reduce, reuse and recycle all MSW back into the nature or the marketplace in a manner that protects human health and the environment, and also and most importantly from the Waste Board's perspective, honors the principles of California's Integrated Waste Management Act.

Forums such as the one today help the Waste Board realize that goal by involving the public, the industry and government sectors.

In closing, currently we have a growing population faced with limits of our resources from the environment. We understand that our society and industrial systems must begin to mimic nature and move from being primarily linear to being cyclical.

Each material must be used as efficiently as possible, and must be chosen so that it may either return safely to a cycle within the environment, or remain viable in the industrial cycle.

The only limiting factor in our success is the boundaries of our imagination. And like Albert Einstein said, "Imagination is more important than knowledge." So, thank you very much.

(Applause.)

MR. WILLIAMS: Thank you, Fernando. Very inspiring talk actually. Let me get the slide going for the next speaker.

(Pause.)

MR. WILLIAMS: Our next speaker comes to you from the National Renewable Energy Laboratory in Colorado. We will have John Sheehan. He's the Senior Engineer there and he has over 20 years of experience in chemical and biochemial engineering. He's been at NREL since the early 1990s.

In the past six years or so he's authored groundbreaking lifecycle assessment studies related to biodiesel and ethanol technologies. And his latest work involves an evaluation of the sustainability of using agricultural residues as a feedstock for fuel ethanol production which includes understanding the soil, carbon modeling and complete lifecycle analysis to provide major source sustainability.

So let's hear Mr. Sheehan.

MR. SHEEHAN: Okay, as Rob indicated I'm John Sheehan; I've been at NREL now for longer than I've worked anywhere else, but it's been a great place to be in terms of looking at biomass energy as clearly, I think, one of the sources of alternative energy that is, as my title implies, more than just a bridge to a sustainable energy future. It's actually part of that sustainable energy future, and a substantial one at that. Which I'll try to illustrate here.

My subtitle is thoughts on net energy balance and other nagging questions about biomass as a sustainable energy resource. The net energy balance question for biomass and for things like corn grain ethanol has been a point of confusion and controversy for the more than 20 years that certainly corn grain ethanol has actually been a growing industry in the United States. That debate continues today.

And I want to address some of those questions and confusions that come up. So, in particular, I'm going to give you about a ten-second description of what a lifecycle analysis is, and how you can use it to look at questions

like the net energy balance for a fuel, or carbon balance or the net greenhouse gas emissions associated with a fuel. And highlight one or two other impacts that are out there associated with biomass in order to answer this question of whether or not biomass really is a viable and sustainable energy supply.

So, lifecycle analysis. If you've ever had to do one, you have my sympathy. It's a lot of work. It's very complicated stuff. It is as complicated a job as you want it to be in terms of what are the things that you do and do not want to include as you look at all of the energy and resource and emission impacts associated with the lifecycle of a fuel.

So, for biomass that can be going to the forest to collect residues, or to the farm to collect residues, or to the farm to grow energy crops, all the way through to that end point use when that vehicle, in the case of a transportation fuel, is actually using your fuel.

The devil is in the details. And this contributes to, I think, a lot of the problems that we have today in publicly understanding what is the energy value of biomass to our society. So

that's it for lifecycle analysis.

Now I'm going to turn to energy balance questions. And I have a picture here of the 19th century French scientist Sadi Carnot. I was going to do a contest to see if anybody recognized him, who, among a bunch of other people, is given credit for having begun the process of formulating what we now know today as the first and second laws of thermodynamics.

I have a colleague at NREL who believes that part of the problem of getting around to the point where people can have an honest discussion about the energy debate in this country is that we need to require every citizen in this country to take a course in thermodynamics.

(Laughter.)

MR. SHEEHAN: That's asking a lot. But I think it's true. And interestingly enough, when Carnot began to develop his ideas about what eventually became thermodynamics, and in fact, he had -- his whole framework for looking at the problem turned out to be wrong, but he did such a clear logical detailed job of looking at the energy question that there's still a lot of value in what he did.

And he didn't so much discover the second law of thermodynamics, as he did assume it. Because he knew that if you're going to produce work, if you're going to move one source of energy into a more usable source of energy, it's going to cost you.

You have to lose something. And that sort of no-free-lunch concept really kind of is the predecessor to what became more formally the second law of thermodynamics and what people talk about as entropy.

So, what's that saying? For our purposes in looking at turning biomass into fuel, or anything else into a usable fuel, what it tells us is that if you're going to go from one form of energy into another more useful form you're going to pay a price for it.

That is true for petroleum. And that is also true for biomass. And it is true for all forms of energy production. So it drives me crazy when we constantly hear the old saw about biomass, whether it's particularly related to ethanol, but my gosh, it has a negative energy balance. Well, it better, as does everything else.

The question really comes down to what

do you want to count, and what types of energy are you interested in looking at. And that's what I want to get into briefly here.

When we look at defining the net energy balance in our life cycle calculations we generally try to talk about what's the nonrenewable component of that. Because from a policy perspective that's what we're interested in doing; we're trying to reduce our dependence on nonrenewable or fossil sources of energy. Not only because they're nonrenewable, but because they contribute to climate change issues, as well.

And we want to be able to look at how effectively are we using the renewable energy component that's in that biomass.

And then this last category, which really gets messy, is what's the total energy balance or energy efficiency of technology looks like. And total is a very messy term, because it depends on what you want to count.

You can make the efficiency of a technology look as bad or as good as you want depending on what you do and do not include in that energy calculation.

So, for our purposes the very simple

view of the net energy calculation, we focused mostly on this question of how effectively are we reducing or avoiding the use of nonrenewable energy. So you have all these coal and oil and natural gas inputs going into, in this case, a lifecycle for producing and using ethanol.

And out of that production lifecycle is coming fuel for your car and electricity. And that ratio or that difference between those two is what people are talking about quite often when they refer to the net energy balance for a fuel.

So, here are some quick looks at results that I've been involved in, or some colleagues of mine have been involved in over the years looking at the net energy balance question.

As I point out, if you look at the gasoline net energy ratio, it's got to be less than one. It's all fossil energy coming in. There's got to be less fossil energy coming out in its lifecycle. And it's, you know, give or take, you know, whose study you want to believe, it's something like 15 to 20 percent energy penalty for getting petroleum out of the ground and into the form of usable gasoline.

One of the latest published studies on

the net energy balance for corn grain ethanol, work very nicely done and well documented work done at USDA, shows that that energy ratio for corn grain ethanol, at least a couple of years ago, was on the order of 1.3 to 1. What's that mean? It means for a unit of putting fossil energy in, I'm gaining about 30 percent in usable fuel energy. That is not a huge gain, but it is a gain, and it's not a loss, as you'll often hear portrayed.

Now, when you move to cellulosics, when you're using all of the biomass that's involved, or all of the plant matter that's involved, you can actually get a leveraging of fossil energy that's more like 5 to 10 to 1. And that is why cellulosic technology is seen as sort of that technology to which we know we want to move the current corn ethanol industry.

Okay. Again, results are very very case specific. Not only are they dependent on what type of material you're using to make your fuel, what type of biomass you're using, but it depends on where you're doing it, it depends on so many factors that you have to be very very clear in your understanding of what you're looking at.

And here you'll see a variety of results for what is the net fossil energy input per mile driven on ethanol, or on a fuel I should say, as a function of different feedstock materials coming in.

As you see, if gasoline takes roughly 6 megajoules of fossil energy to get you to drive a mile in your car, that number drops to only 4 megajoules for corn grain ethanol and gets as low as around 1 when you get into the cellulosics.

Again, in 1998 I did a study on biodiesel. Interestingly enough, the energy balance for soybean derived biodiesel is much better than the energy balance for corn grain to ethanol. The biggest reason for that is soybeans don't need nitrogen fertilizer. And nitrogen fertilizer use on the farm is a huge source of fossil energy demand.

Okay, now for my diatribe on energy and the public, kind of coming back to my second law of thermodynamics argument. I call this particular slide the Pimentel phenomenon. David Pimentel is a Cornell researcher who, for the last 20 years, has published repeated studies showing how negative the energy balance for corn grain

ethanol in particular is.

And what I show here kind of helps you to understand a little bit what's going on in this debate. If you look at the published literature over the last 10 to 15 years on this topic, one, there is a lot of uncertainty about what this number is. And some of the uncertainty is just a matter of, you know, my methodologies aren't the same as yours; my data source isn't the same as yours. I looked at a different region than you looked at. All sorts of reasons why these numbers can vary.

But what the trend shows in the analyses that have been done on corn grain ethanol, and why the reasons there have been so many is because people keep coming back to this question, is that in the early days of this industry it did have a negative energy balance in terms of fossil use.

You had to put more fossil in than you could get out as fuel. But this is not an industry that has stood still. It has actually improved significantly in its efficiency. The farming process has improved in its yield and efficiency, and things like fertilizer production are far more efficient than they used to be.

So, if you look at the two data parts at the bottom for Pimentel, what you'll see is he's sticking to an old set of data. And, in fact, he's sticking to data sources we can't necessarily always track down.

So here you get into the sort of dysfunctional I say it's positive and he says it's negative. It doesn't get the public anywhere in their understanding.

Here's another example. Interesting how today I've heard a lot of people use the term wells to wheels, which is a pretty strange way to describe the life cycle for biomass. But nevertheless, that term has gained coinage as a result of a very good study sponsored by GM and Shell and a number of the oil companies and automakers who brought Argon National Lab and a couple of others to the table to look at the energy balance questions for, and other life cycle issues, for biomass. And actually all alternative fuels.

And one of the results that got thrown at us early on, we had an Assistant Deputy Secretary for energy efficiency and renewable energy, turn to the head of the Office of Biomass

and say, why the heck are we working on ethanol when I'm looking at this study that says that ethanol use is five times more energy to deliver an amount of fuel energy than gasoline does. And these are the numbers from that study.

When you look under the hood a little more at what's in those numbers, what you see is that almost all of that energy that they counted on the biomass side was actually renewable energy. And only a tiny fraction of it was fossil energy. Whereas all of the energy used in processing oil to gasoline was fossil. So there's really a five-to-one ratio in the other direction for this number.

But it's even more confusing. Why did they end up with a number like that? Because the people who sponsored the study firmly believe that the energy content of the crude oil, itself, is free. And therefore the embodied energy in that fuel, itself, doesn't have to be counted in the calculation. When you put that back in you get a much much different type of result. In fact, their result's more optimistic than numbers I have generated.

So, now, total energy. I believe there

is a reason to want to look at the question of what is the total energy required, what is the efficiency of the total energy you're bringing in and its use as a fuel. And what that includes for me is all the energy it took to move biomass around and process it. But also the embodied energy in the biomass, itself.

When you look at it in terms of efficiency what you see is biomass technology is much less efficient than current refinery technology is. And that shouldn't surprise anybody because we have not had 80 to 100 years of process development work going on.

We have now begun to look at these questions in terms of how do we move toward the types of efficiencies that you see in turning crude oil into a usable fuel that you get in today's oil refinery by combining different fuel production and using all the elements of the biomass to make your fuel.

I've about used up my time. On the carbon balance issue what I really want to say is where fossil energy goes so does carbon. And in most cases what you see is biofuels are really among the most effective reducers of greenhouse

gases because they participate in what the Deputy Secretary called that virtuous cycle of photosynthetically recycling carbon. So those numbers generally do look good.

Got a couple other slides in here that I'm going to skip that point out some problems. Big problem for biomass, nitrogen. There is a huge amount of nitrogen that is being emitted, and I'm not talking about nitrogen emissions that are worse, as we have heard today from some people, at the tailpipe, but on a lifecycle basis nitrogen emissions that are much -- that are an order of magnitude higher at the farm than they are for the entire lifecycle of gasoline production and use. Those are issues that need to be solved.

The land use issues need to be solved. But, coming back to my second law theme, there's no free lunch here. And if somebody comes to you and says I've got a perfect solution that has no downsides, in my opinion you need to hold onto your wallet, because I haven't seen a process that comes out that way.

And I'll stop there.

(Applause.)

MR. WILLIAMS: Thank you, John, that was

very interesting and educational. I think a lot of people will take -- and take this information home with them for their business and debates with other people.

Our next speaker is Ken Krich. He is a Project Manager for Sustainable Conservation, which is a nonprofit environmental organization in San Francisco. He's currently working there leading the dairy anaerobic digester initiative; and in that role he was instrumental in getting net metering for dairy digesters to pass in California Legislature.

He's recently been appointed to the Western Governors Association of Biomass, the biomass task force, that is. And he participates in the San Joaquin Air District's Ag Dairy Subcommittee. And he is currently also Assistant Director for the University of California, California Institute for Energy and Environment.

So let's have Ken come up and speak about environmental regulation and energy generation in the California dairies.

MR. KRICH: So I work with Sustainable Conservation. We're a nonprofit. We work to find cooperative solutions to work with the dairy

industry and other land industries, landowners, to improve their environmental performance, and hopefully make some money for them at the same time.

We work on composting, conservation; we work with the California dairy quality assurance program. We work on confidential nutrient management programs.

So you've heard some of this stuff. Dairies are the largest agricultural industry in the state. We're the largest dairy state. These cows that produce 120 pounds of waste per day also produce 50 pounds of milk. And they only weigh 1400 pounds. So a lot of material goes through those cows.

(Laughter.)

MR. KRICH: Dairies in California are mostly in nonattainment areas, unlike dairies in the rest of the country. So all kinds of air quality issues get involved with the dairies.

Dairies have water quality impacts. They produce nitrates and salinization. If it's not properly managed the dairies can be a major source of stream and groundwater contamination.

There are air quality impacts, VOCs,

particulate matter, ammonia. Dairies probably produce about 1 percent of the greenhouse gas emissions in the State of California. And that's working on methane; we don't even know much about nitrous oxide, but they also contribute to nitrous oxides, that is N2O. And there are problems with odors and flies.

As we've heard, former speakers have talked about it, so I'm going to try to go quick here on this part. We have these methane emissions coming off of fresh dairies. They're just wasted. They're producing greenhouse gases; they're releasing VOCs. The digestion can enhance and capture the biogas, which is mostly methane. It can produce electricity or it can be upgraded to what we call biomethane. That is a renewable source of natural gas by removing the CO2, the hydrogen sulfide and the moisture.

One little footnote here is 3 percent of natural gas in the United States is used to create fertilizer. And, of course, land-applied manure is a substitute for chemical fertilizer if properly applied.

So these digesters have some environmental benefits. In the process of doing

that they run into regulatory issues, which is what I'm trying to focus on here.

Dairies in California were free of environmental regulations just a few years ago. California agriculture had an exemption from the Clean Air Act. It was the, I think, the only industry in the nation that had that exemption. (inaudible) in the '70s. There was a lawsuit recently between -- Justice and the Center for Race Poverty and the Environment against the USEPA that said they needed to end that exemption. The USEPA agreed and Senator Flores, and told the state you're going to have about a 5, I think it was like $5 billion a year in highway funds you're not going to get. So that got their attention.

And Senator Flores initiated the SB-700 which ended that exemption.

There are new rules now for confining on the feeding operations and the National Pollution Discharge Elimination System. There are solid waste issues in terms of permitting for compost. And greenhouse gases, no regulations yet, but of course there is some movement in the state to start dealing with those issues, which, as I said, dairies have a major impact there.

So let's talk about a couple of these regulatory issues. One of the other programs we do, it's -- conservation, it's what we call the Partners in Restoration. There are a lot of watersheds in the state where the landowners want to do good things environmentally, but they find there's ten different regulatory agencies with different requirements, some of which are just downright contradictory. And one of the projects we try to do is try to figure out a way through those things.

So, VOC emissions. The Air Board determined that cows produce (inaudible) pounds per year of VOCs, which they call ROGs in California. This made dairies under the, now that they were regulated by the Clean Air Act, a major source of VOC emissions.

It turns out that number came from a 1938 study of methane emissions, not VOC emissions, from a cow that was producing 20 pounds of milk. So it was a very different kind of cow than today.

So this became a big issue in the dairy industry. So eventually a search was underway to determine what is the proper emission factor.

But using that factor the dairies with more than 1954 cows become a major source of emissions and were required to initiate best available control technologies on (inaudible) for air emissions.

So the San Joaquin Air District proposed that an anaerobic digester be required as best available control technology for these large dairies. So here we have a situation where a digester may be required in certain situations, and the South Coast District is making a similar proposal.

Then you have the issue of NOx emissions, as the landfill gas talk this morning said, there are NOx emissions. Dairy digesters weren't regulated in their engines until they're just now going to become regulated. And the San Joaquin Air District proposal of 50 parts per million requirement for NOx.

But interestingly the Air Board, under the SB-1298 guidance, said that 50 parts per million was the best available control technology. So now the best available control technology is about to be the requirement for dairies unless they have very small engines.

The Air Board based this target on studying large (inaudible) 500 kilowatts and larger. Most of the dairies are smaller than that. And they're setting a target for 2007 which is -- it's more like a central station at like 9 parts per million.

So, we see a problem for the dairies. The hydrogen sulfide corrodes the microturbines, prevents catalytics on the back end. It's expensive to remove the H2S to the right standard. Lean burn engines, which is what the landfills use, are not available in that size range. The smallest lean burn engine we're aware of is 180 kilowatts that a German Company, Deutz, uses. They're about Deutz engines in the United States. They have an office in Atlanta. There is, as far as we know, one on a dairy in Wisconsin. We don't know quite how it's working.

So, the farmers are going to find that their life got more complicated. They're fairly complicated enough to put in an anaerobic digestion system because they're not electrical engineers or plant engineers.

So the more complex the solution the more the chance that the farmers are not going to

move forward. And in fact the current digesters may be abandoned. The digesters that were built in the 1980s largely got abandoned because they were too complicated. What the practitioners have determined is the simpler it is and the more robust it is, the more likely the farmer is to keep operating it.

So although NOx emission controls can be put in, it's going to make it more complex for the dairy farmer and more problematic.

So, as I said, how do you solve the NOx problems? Well, work on the smaller lean burn engines. I believe the CEC's PIER program is going to do a search on 260 kilowatt Deutz engine. We heard about that this morning. Find better and more robust ways to remove the hydrogen sulfide. Certainly we need research and development on this area.

Go for a centralized digester, then you move the gas to a centralized place where you can put in a larger engine or more sophisticated equipment. Of course, you could upgrade the biogas to what we're calling biomethane, essentially a CNG equipment product or a pipeline gas quality product where you're not combusting

it, and under the NOx regulations.

So as we see the impact of the regulations, the VOC regulation encourage the digesters. The NOx regulation will discourage the digesters. Greenhouse gas regulation, as it existed, would encourage them a lot.

And then you have some complexities with the Waste Management Board in terms of how you compost the manure, what permits are required, and if you want to use other waste streams.

So, what we come down to is that no energy solution is perfect. You have, in biodiesel for example, you have a lot of improvement, a lot of (inaudible) but you create a little bit more NOx. How do you evaluate these tradeoffs? A lot of improvement in greenhouse gases.

The VOCs, by the way, the studies that they're showing is that the (inaudible) pounds is probably a little high; from the studies, probably come in a little lower. But it turns out most of the VOCs don't come off the manure but come out of the digestive process of the cows. They belch the VOCs. Those are going to be hard to control with a digester.

(Laughter.)

MR. KRICH: But the parts -- the manure, the digester when it's combusted will pretty much destroy them. It's great for odors. Odors are an environmental problem even if they're not very regulated. But then you have this issue of NOx emissions. How do you trade it off? And what is the tradeoff between NOx and VOCs?

There's new research on that indicating -- I'm not a scientist, but I understand it's a bit of an (inaudible) where that tradeoff is, and the localized issue --localized problem.

Nevertheless, we need to work on solving this waste gas NOx problem because whatever I may think about the tradeoffs, the regulations looks like they're going to come down to a 50 parts per million requirement.

So, we need to come up with collaborative solutions where industry, government regulators, environmentalists try to work together to solve these problems. We're not a big believer in adversarial solutions moving it forward, because we tend to find people stick to one of these tradeoffs and they think that's the one

that's important. And they got another tradeoff for another one.

But we want to move forward on the overall solutions to these air problems and environmental problems. And regulations need to work together and be coordinated so that we don't have one regulation going one direction and one going in another direction. But rather that the regulators get together and come up with a solution that moves the whole thing forward.

Because as we've heard many times today, we can't afford to waste the methane and the dairy biogas and the digester gas and then the natural gas.

Thank you.

(Applause.)

MR. WILLIAMS: Thank you, Ken. You bring up lots of important issues that are going to require collaborative solutions amongst industry and the regulators, especially.

Just a moment here. Yes, got the right one. Our next speaker is Mark Nechodom. He comes to you from the Sierra Nevada Research Center, which is a unit of the U.S. Forest Service, Pacific Southwest Research Station. He is a

social scientist there.

And before joining the U.S. Forest Service he was a member of the faculty at University of California at Davis.

Currently his research focuses on the institutional and political dynamics of environmental decisionmaking. And today he's coming up to speak on environmental impacts of woody biomass utilization. Mark.

MR. NECHODOM: Thank you. I was thinking, one of the nice things I think on your behalf of having to send our presentations in the day before is you keep thinking of all these slides that you really wish you had in your presentation by the time you get up here. It's better for you. I'm dangerous when I sit in the audience with my laptop.

But a couple of things here. Jim Boyd and Joe Desmond, I think, set things up really nicely. And one of the slides I think I would have included is something to the effect of it's the economics, stupid. And that is we're looking at essentially a number of public benefits that are associated with biomass power or biomass utilization in any number of forms. And yet we

don't count those very well.

And when the gentleman stood up and said how about the billion dollar bucket, it's, you know, one of the things that's on the table is how do we essentially price the things that are externalities that actually might be benefits.

So, I wasted a whole slide's worth of talk on that, anyway.

I'm really grateful to John Sheehan, and I really appreciate his work. I've learned a great deal from John over the years. He explained very clearly what lifecycle assessment is. And I appreciate that, because it kind of sets up where we're going today.

The main project we're working on here is a lifecycle assessment of a very narrow pathway in biomass utilization. And that is from forest remediation where we have the fuel problems into biomass power generation.

Oh, that's clever. I went right to the end.

(Laughter.)

MR. NECHODOM: So we'll get a quick preview of my presentation here --

(Laughter.)

MR. NECHODOM: Now I can just stop talking and we'll go to the discussion. This is a fairly familiar map to many of you. This was developed during the early stages of the national fire plan in which we were being asked by Congress and the entire public where is the problem.

Now, I'm going to cheat a little bit, and I know my forestry people would be a little bit annoyed at me for saying this, but --

(Laughter.)

MR. NECHODOM: -- maybe I won't say this. But the red stuff is basically where we have forest ecosystems out of whack. Now, this is a very complex analysis and I'm not doing it justice.

The yellow parts are a little less out of whack, kind of medium out of whack. And the green is probably within whack.

(Laughter.)

MR. NECHODOM: Whatever that means. Now, here's the problem. Most of the out of whack ecosystems are out of whack for a whole bunch of reasons. And when we say they're out of whack what we really mean are the natural fire regimes in those systems are really nowhere near their

historic range of variation. The vegetative structure is not really in a sustainable pattern as we understand it, et cetera.

These are some fairly gross generalizations, but this is a terribly important map because this is part of the billion ton problem that John Ferrell was talking about earlier on. The forest resources, that is just the fuel loading alone, ignoring the forest products industry and mill waste, accounts for about a quarter of that 1.3 billion tons that could be available.

So I'd like to frame this a little bit because this is, I think, a very important way to approach it. And I've got to tell you what my bottomline is here. The essential drivers, in my opinion, in our opinion, many of us, Forest Service -- not representing the official view of the Forest Service here. I have tenure so it doesn't matter what I say, I suppose.

But the drivers here are really public safety, amenity values, watershed protection and ecosystem services or values, and I throw biodiversity in there, or Endangered Species Act kinds of actions, because these are the things

that are really driving forest policy now. It's not about a timber industry.

Now, the solutions, Congress and the public come to us constantly and say, well, how bad is it really, how bad is it. And what are the tradeoffs we have to make to solve the problem per the laws of thermodynamics, thank you, John.

What's the return on the investment. What if we do spend $750 million this year of fuel load reductions, do we get $750 million worth in return. It's a big question and many people are asking it.

And the other question that's really a political question is can some do well by doing good. That is there are some interests out there who basically just hate the fact that somebody actually might make a buck off of the fact that we're treating our forests. It's a huge political controversy. I make no comment one way or the other on it. We all know that that is one of the big issues controlling the supply from at least the federal lands, is we have to deal with a whole bunch of politics to even deliver the biomass.

So there's a huge article of faith in all of this, that in order to bring our forests

back into what I'm calling whack, we have to whack them.

(Laughter.)

MR. NECHODOM: I knew I was going to say that, I didn't mean to say that, but we have to basically do some treatment there.

There's a quality about forest biomass is it goes up in the air, it goes down in the ground, or it goes out someplace else to be used. It really can't go anywhere else.

But I want to also suggest to you that from our perspective, from public lands management in a fuel loading reduction framing, we have a waste stream problem. We do not have an industry creation problem. The problem is not to create a forest industry. There is no doubt whatsoever that infrastructure, capital investment, all of that must happen in order for us to move the biomass around. We cannot do it for free. But we have a waste stream problem.

Now, of course that means that the waste stream could be used for things like biomass power. So we put some numbers together based on some averages in this kind of new emerging industry we call fuel reduction or forest

remediation, and we find that for an average biomass plant -- I'm sorry you can't read those labels very well, I'm afraid -- and average new biomass plant, 7.5 cents a kilowatt hour is what it takes to run it. Now we hear a range, 6 to 10, but it's about 7.5 cents a kilowatt hour in the California market.

And as you can see, transportation of the feedstock is a major part of that. Collection, processing and transport is the killer. It's one of the reasons that one of the solutions we're discussing is a $20 a green ton subsidy.

Now that I have said subsidy let me suggest a different way of saying this. I would really prefer not to use the word subsidy any more. What I would really like to say is we are purchasing a public good, or a suite of public goods. That's what we're really doing with subsidies. We need to transfer money from one place to another, ratepayers, taxpayers, et cetera, to another to achieve a public benefit.

Now, this is Greg Morris' work. He did it five years ago, and I think it's the best stuff there is, and it's one of the reasons he's on our

LCA team. And Greg shows a total benefit avoided costs, compared to fossil fuel burning, across the biomass power industry, of 11 cents a kilowatt hour. And this is a very very conservative set of numbers. You take the model apart and you find that Greg has been very cautious in the assumptions he's made.

That's a substantial amount of cash per kilowatt hour. Let me ask you guys in the power industry why aren't you getting that. Why not? Well, we don't have market-like mechanisms that would allow us to go down this list and a much longer list and put prices on these benefits.

Now, I'm talking about crassly monetizing ecosystem services. Let me be straight with you. We're actually talking about putting a price on things that people are a little reluctant to negotiate.

But if you compare the 5.3 cents a kilowatt hour, the retail value of power in the California market 2002, after things settled down; the cost of biomass generation in the second column; Greg's numbers at 11.4, and those are conservative. If we were counting more, I urge you to note the sources and citations on these

things. It's basically California's Nechodom and Mason, Morris and shamelessly hypothetical, but this 15.22 cents was a very rough calculation we made based on some studies of wildfire effects, catastrophic wildfires, ten of them, in which we analyzed or actually a group at Yale analyzed the uncounted costs of those wildfires.

So, I think I'm going to skip this slide because John did a great job of doing this. Basically what it does is it forces you to think very carefully to do a lifecycle assessment, very carefully about every little niggling unit process in the system. And to model all of that.

What we are doing is a little outside of the normal community of lifecycle assessment practitioners, and we are actually taking what we're calling a 4E approach, economic viability, environmental impact, energy efficiency and social and policy effectiveness.

Let me emphasize that for our study in lifecycle assessment for biomass to power, we are excluding E4. We don't know how to model that. We've got enough problems with E1 through 3.

This is how we're doing it.

(Laughter.)

MR. NECHODOM: Thought I'd let you meditate on that for just a minute. I really don't expect you to read that. But this is actually the plotter paper piece that lays on the conference table when we get together, and this is probably iteration, major iteration number four. And we are trying to basically map out the conceptual model for the system.

This will be a little simpler. Basically what we're trying to do is track energy, environment and economics through a system, so you have energy, materials and capital and costs. In the wildland biomass treatment options -- you can follow the little red arrows down through the boxes -- what we're trying to do is say can we model each one of the processes inherent in doing a forest remediation treatment right down to the buss bar. And we believe we can. And I think the Energy Commission believes we can, because they gave us $2 million and we better spend it wisely.

Here's another way of showing you the nature of the models, the conceptual framework here. This can get a little confusing, no, not can get, it really gets confusing because this is really hard stuff.

We have in the upper left-hand corner for you, module A basically is forest remediation techniques. We're going to make some assumptions about prescriptions, that is how much you're going to remove from a given stand to achieve a change in fire behavior under certain wildfire conditions. We have to make a bunch of assumptions in that territory.

We will compare that, probably mostly theoretically, but based on as much data as we can get, from real places in California. What happens if you don't treat that. That is, what are the costs associated with a large scale, catastrophic wildfire. And I'm marching through definitions and assumptions very quickly here. And you're within your rights to interrogate me when we're done.

We will basically then follow all of the processes, machinery used, energy used, capital investment costs, all the way through forest remediation in the management of the biomass, right down to transporting, processing at the plant and then, of course, generating the electricity and moving that electricity to the grid.

This is huge. It's probably foolhardy. But so far we're actually having a good time. So here's the status of where we are, and you're welcome to email me or call me and I can send you a lot more information. I take it these presentations will be available online anyway, on pdf document.

So, we just got started. We're really just getting underway. We have done the conceptual mapping to our satisfaction. We have both a technical and a policy advisory committee, because as you can well imagine, in the policy world our assumptions and our scenarios could prove very useful in thinking through what some of the policy options are. In recapturing public benefits.

We're using a model called Umberto. It's made in Hamburg, Germany. It's a process flow model. And we expect to have at first a kind of hand-cranked version of this ready for our policy advisory committee in June, by July when we meet.

So, welcome to email me or call me and we'll send you more information. Thanks.

(Applause.)

MR. WILLIAMS: Thank you, Mark. I, amongst a lot of other people, will be looking forward to some of those results when they're ready. Thank you.

Our final speaker on this panel is Mr. Doug Wickizer, who comes to you from California Department of Forestry and Fire Protection, where he's been working there since looks like the mid 1970s, I believe.

Before that he worked with the U.S. Forest Service, Region III. And he's currently Department Chief for Environmental Protection, Regulation and Forest Product Utilization.

And his topic is regional cooperation for energy and environmental management.

MR. WICKIZER: Thank you, Rob. Good afternoon. It's nice to see that being the last as this point you'll soon get an infusion of energy and a lack of carbon dioxide. So, -- forward with that.

What I'm speaking to is more of a social, I think, than a technical issue. And it sort of follows Mark very well in that case, because it's blending more from the technical to the social aspects of how we get things done.

When we talk to regional cooperation I'm going to go through this rather quickly, because we are limited with time. One thing I have learned from the very beginning is that if we do what we know we should do to begin with, our initiatives will carry through fairly well. But if we tend to use bad practices, I've seen that result in shifting from initiative to luck. So that's just a basic rule I think we learn from the outset in cooperation, and that's really the bulk of the message and what you'll hear at the end.

Biomass cooperation is more or less, the extent of it depends more on the identify of the stakeholders and the various needs and objectives. You have a waste stream that's argued. On the other hand I've heard it argued at the Collaborative that that's not a waste stream, it's a product. So I think we're still somewhat up in the air on that.

It includes residues from agriculture, municipal waste and urban waste. It has an outcome of high end products and an outcome of low end products.

Being a forester the high end products I'm interested in are more of the logs and the

reconstituted wood products. Something that I think may have been brought up in the other technical session this morning of niche products.

I think there's a lot of room to include that in where we're headed with the utilization of biomass over the upcoming years.

Low end products, I got somewhat slapped on the hand by a member of the audience earlier for including electricity in that. But I think that's also arguable, given the numbers that we're seeing and how they flow over the range increases and decreases depending on who's talking.

Fuels and compost bed, animal bedding, worm casting, sod, plant bedding, pallets and landscaping. Again, the niche concept, niche market concept coming out there.

Who are these cooperators that we deal with on these projects, and what do they have to gain out of it? It's a wide variety of folks when you get everyone in the room, you're looking at yourselves, realistically. You're dealing with all levels of government, you're dealing with the industries, various industries, and they have different objectives when you're putting a project together.

You're dealing with the academics. You're relying on research done by national laboratories. And what you're doing is bringing a body of these folks together to try to get something done.

Why do they get together? What's to gain? There's environmental values; there's environmental gains that are made in these kind of projects. The banners that we carry include public health and safety, improved homeland security. We've heard that brought forward with the reliance on the fossil fuels.

Reduced fire hazard and reduced GHGs and air quality. Waste disposal reduction issues. Past management, I'll show you an example of that soon. And argumentatively you get improved wildlife habitat out of that, as well.

In California, I threw those slides together just to demonstrate one thing, you know. Those two black and white ones are Red River Lumber Company from in the '40s. And the forest looked a ceratin way in California at that time.

And if you look at the upper slide on the right that comes out of Shasta County. That's what the current forest looks like. It's quite a

bit smaller. And harvesting over time has caused successional changes that we're having to deal with in forest management. That part of that management produces the biomass that's been referred to earlier.

Examples of what we're dealing with on an ongoing basis on cooperation is items like the Biomass Collaborative in Oregon, in that this is a regional effort. You're dealing with folks like the Oregon Energy Trust. The U.S. Forest Service has utilization teams that work with us on a regional level. The National Renewable Energy Laboratory.

Some that aren't there necessarily are the California Climate Trust. Those are becoming very reliant upon some of the work that's being done with biomass for climate change impact reduction, or GHG emission reductions.

Some of the project-specific issues that we've had -- or some project specifics that have come up in recent years, the Southern California Pest Mortality, one we're closing down. I'll get into that in a little more detail in a second. Healthy Forests initiative is ongoing. Fire hazard reduction, that 's the infusion of large

amounts of funds, both from the federal level, referred to under Healthy Forests. And at the state level with proposition 40 for water quality protection, watershed impact reduction.

You're got issues coming out of national EPA on blending coal and biomass. Again, to demonstrate the idea of the climate and the bioenergy overlapping you'll see that there's a western carbon sequestration partnership that does involve a number of the western states. And one of the pilot projects we're doing involves the use of biomass. I'll show you that again in a second.

You have the California Interagency Biomass Task Group. I used the wrong name; Mr. Desmond introduced that earlier. That's a newly forming group that will be working that area.

And then for very specific examples, something we're proposing to do in a cooperative partnership is a very specific small generation plant at one of our conservation camps, a megawatt or less.

The examples, quickly on the examples that we've had to deal with, first is one that was kind of winding down, we're kind of -- the dust is settling in southern California to an extent on

this one. Not completely, but it's a lot less than it was.

It involved roughly three counties, Riverside, San Diego and San Bernardino. You can see from the photo that it had, from the photo and the map, that it was an extensive area that it covered. And the drought enabled insect infestations. It became epidemic level. And it impacted roughly 650,000 acres of land in that map area is what's represented.

In that we had part of the Cooperative that we've done in that arena is dealing with how do we know how much is there so we know what to do with it. So we spent quite a bit of time with the USDA and NRCS and others in doing the inventory on this.

It washes out to say approximately 2.8 million bone dry tons that are out there in those mapped areas. And that's -- when I say within those mapped areas, when we treated this we treat it only with the concept of reducing highest risk, areas of evacuation, power line clearance, et cetera, that type of thing.

That 2.8 million bone try tons represented about 220 million boardfoot of conifer

species, both of these. At the time that project started, it was predicted at 100 percent mortality. Weather changed, the climate changed, we aren't there any more. But we came close.

What do you do when you're faced with a situation like that? This is an example of a kind of forced cooperation. It's a reaction to a catastrophic event. Those are a little easier to deal with. In this case the Governor proclaimed an emergency; the state instructed all of the agencies, called them all together and said provide some regulatory relief and enable the reduction of that risk and hazard out there.

Local communities organized very quickly; they called them mass and fast, you know, I got confused there and didn't know what letter to put in front the a-s-t, but it all worked out. And they worked very well together and they worked very quickly. They were under a great deal of pressure. Their action plan was initiated probably within three to four months of when the proclamation was declared by the Governor.

And again, just a quick list of those areas that they listed as priority, or quickly treated areas. And there was a great deal of

money put into that. And there was some return out of it, and part of that came from a quick study done by the USDA, ourselves and again, others, to find out where we could put biomass.

How do we deal with it as a waste? And how do we take other portions of it and turn it into products.

A quick example of the scope of that, just an example year, this last year. For a three-county area there was roughly between 700,000 and a million green tons treated. That's a significant amount of material to move.

Going from that I'm going to shift formats on you here. This is more dealing with a project that we're certain is going to occur. But it's not, itself, implemented yet. Some predecessors to it, such as the California forestry protocols under the California Climate Action Registry have been implemented. And that's, again, going back to the Western carbon sequestration partnership that's developed for Washington, Oregon, California, Arizona and parts of Nevada. That's a pretty far-reaching regional cooperative venture. And it's actually working quite well.

You can see a list of the cooperators that are there. What the project's going to do is to demonstrate three of the -- two protocols that exist that we've already approved in California under the Climate Action Registry of forest management and then restoration of forest areas.

The last of fire management is one that we're going to be working on to develop with this demonstration project. It, in essence, -- funding for that is federal grant dollars, $1- to $2- million a year; it has state matching funds, as it shows.

The environmental management of these things is important, and it is to deal -- the quicker you get all the partners onboard we find the less dissatisfied the potential customers we have. And therefore it's easier path to hoe with the environmental documentation.

Operationally we're dealing with nongovernmental organizations. It'll provide the service of measurements and monitoring. Land order will conduct the treatments and RC&Ds will do the state project planning.

The last one I want to cover real quickly is the Washington Ridge biomass

electricity project. Quickly, the material removed from that WestCarb Association will be turned into biomass in existing plants.

Washington Ridge is one we don't have in hand; we've been working on for two to three years in cooperation with the group you see listed there. What we're trying to put in place is about a 600 kilowatt combined heat and power plant at one of the conservation camps. The purpose of that is to demonstrate the usefulness and the economic viability of distributed generation from the 1 to 5 megawatt class.

The conservation camp project will use 15 to 20 tons a day. It's local source of fuels from the fire hazard reduction treatments. About 340 operating days a year. And we'll have roughly about 400 kilowatts of power to be able to sell on that. That one chart is just the one estimate of what that would cost.

A quick representation of the system we're going to be working with. One of the outcomes will be dealing with the concept of NOx that was presented earlier.

Take home message that I have for you is that it's a big world out there and we all have an

opportunity to work together. The more often you take that, the more frequently you accomplish something.

(Applause.)

MR. WILLIAMS: Thank you very much, Doug. This is the end of this panel, and I would like you all to give a big hand to the speakers. And we don't have time for questions --

(Applause.)

MR. WILLIAMS: We're scheduled for a break, and I think we should come back at 3:00 and we'll get back on schedule. Come up and speak with the speakers if you have burning questions, and there may be a chance after the next panel for questions. Thank you.

(Brief recess.)

MR. MATTESON: Good afternoon, we'll draw them in as we go, I guess. You might find yourself in key situations here. The first is that you have a conceptual design on a new system that you've been thinking about for some time. You've completed your engineering; you've done some work on biology if it is applicable. And now you're on to the business of economic modeling and financing.

And the financing is broken down into the financing of your capital side, that is are you going to finance a pilot plant or are you going to go to a financing of capital full-scale facility.

And then you have to insure that your operating cash flows are going to be in existence through the project time period that you've laid out for your plan. Now, that's for the new.

For the existing you have an established biomass plant, and you have an experience of maintaining a feed stream. Your plant is operating either in a test or in a production mode. You have an economic track record. Now you need financing for overhauls, upgrades and expansion. And you need to insure your operating cash flows continue.

We have three speakers here today to address these financial and economic matters. And the first one is going to be presented by Martha Gildart. Martha is a colleague of mine in the California Biomass Collaborative.

She started her career with the State of California Air Resources Board in 1979 as a student. And she was doing this while she was

working on her masters degree at UC Davis.

She then moved over to the Integrated Waste Management Board and resided there for 18 years, and 13 of those were in the tire management program.

And then she recently joined the California Biomass Collaborative in November of 2003, and her responsibilities in that area included data gathering and policy analysis.

Martha's going to talk to us today about state incentives for biomass products and power.

MS. GILDART: Thank you, Gary. One of the earlier speakers mentioned the need for glasses, you know, it's hard to focus on the audience and your paper at the same time.

I'm going to be giving a brief overview today on some of the state's incentive programs. In most instances on these slides I've listed some of the websites for those agencies so that you could pursue more information, contact them, find out how to apply.

As Dr. Jenkins has mentioned earlier, the Collaborative will be posting these presentations on our website so you'll be able to visit our website and download some information

and get contact information for other state agencies.

Probably the leading agency in the State of California for providing support to biomass facilities is the California Energy Commission, which coincidentally is our funding agency. The main programs are the renewable portfolio standard program, the renewable energy program, which is divided between existing new and emerging renewables, their Public Interest Energy Research, the agricultural biomass to energy program and the dairy power production program.

I'd say probably the most far-reaching is the renewable portfolio standard program. It requires utilities to increase their purchases of electricity from eligible renewable energy technologies. And that renewable includes many other forms, solar, hydro, wave, et cetera, wind. But it does include the biomass digester gas, landfill gas and MSW conversion. It has to increase at a rate of 1 percent a year to reach the 20 percent goal by the year 2017.

There is also a state Energy Action Plan which is trying to accelerate that development of 20 percent renewables by the year 2010.

Under the renewable portfolio standard program the utilities hold competitive solicitations amongst the various biomass energy providers to procure eligible renewable energy. And the Public Utilities Commission has established a market price reference system that is based on a combined cycle proxy plant for baseload power, and on a combustion turbine proxy plant for peak power.

And some of the contracts that might come in above the market price reference may be eligible for supplemental energy payments.

The other major program at the Energy Commission is the renewable energy program. As of July of last year the Commission had awarded over $690 million for various renewable projects. If you caught Tony Goncalves' presentation earlier in the morning he had quite a bit on the results, you know, the amounts of moneys awarded, the kinds of projects, how many megawatts came into being. And I would urge you to look that up if you missed his presentation.

So, in the existing, now this is for facilities that are in operation, they're mostly the direct combustion biomass power plants. Some

of them have been operational since the early '80s. During the restructuring of the electric industry many of them suffered financially. Many of them even closed down or mothballed.

In an attempt to bring some of them back up there were various incentive programs put into place, and one that is current is the existing renewable facility program. They have provided almost $192 million to a variety, not just biomass plants, but the direct combustion biomass and solar thermal facilities predominate. And there's a website here where you can find additional information on that. These plants have to fall into the tier 1.

The new renewable facilities programs provide financial incentives to encourage new electricity generation projects that are most likely to become competitive with conventional technology. So these aren't really, you know, light bulbs in somebody's head type of project. It's more something that may not have been tried yet in California, but has been proven elsewhere. These projects that come online may also be eligible for the supplemental energy payments for the first five years of their generation to sort

of help them getting into the marketplace. In some instances, there may be up to ten years available for that.

So far the Energy Commission's held three auctions where they have awarded funding to over 81 projects of which 45 are online. The supplemental payments of nearly $40 million have helped these 43 facilities operating, which include two biomass, one digester and I learned this morning from Tony, it's actually now up to 18 landfill gas projects. And, once again, there's a website here for additional information from that agency.

The last element of the renewable energy program is the emergency renewables program. This provides rebates to all grid-connected utility customers for the purchase of renewable energy generating systems under 30 kilowatts. The majority of these are photovoltaic, wind, solar, thermal, electric technologies, but they do include fuel cells, among which they can be fuel cells operating on renewable fuels, such as landfill gas and digester gas.

Payments out of the emergency renewable program have totaled over $154 million. And the

rebates are calculated based on the size and the technology of the project. And they can be anywhere from 70 cents to $3.20 a watt for the capacity of the equipment. And there's, once again, a website for additional information on that program.

Looking more into the future the California Energy Commission has a very extensive program Public Interest Energy Research. It's funding around $62 million a year for a variety of energy-related research.

One of the things they are looking at is renewable energy applications that combine with fossil fuel fired energy to provide peak capacity, to increase reliability of energy systems, to expand renewable distributed generation technologies and provide more affordable technology. So there are several projects there.

They also have an energy innovations small grant program that provides up to $75,000 to small businesses, nonprofit organizations and other such entities to conduct research into the feasibility of new innovative energy concepts. And they do this about once a year. The current solicitation has just closed February 1st for the

application deadline; and July awards are anticipated. Assume they will be continuing this. You can, once again, check the website to see what the next scheduled award will be.

One of the programs we heard about this morning, and this is one that has sunsetted, is the agricultural biomass to energy program. It awards grants for a one-year period at the level of $10 per ton of qualified agricultural biomass that the facility purchases to turn into energy. The facility had to be operational in July of 2003. There was $6 million allocated by Senate Bill 704 to this program. They went through, I think, four cycles of award, and when the last 1.4 million is actually paid out, then this program will be fully expended. I think it might be very interesting to see what the analysis is on the success rate. And I think the Energy Commission and the Legislature should be urged to consider such programs in the future.

There was also discussion earlier this morning on the dairy power production program. And you've heard several people talk about the various dairy digester efforts. This can fund development of anaerobic digestion or gasification

projects on dairies. They are awarded as grants that can cover up to 50 percent of the capital costs of a biogas system; or they are provided as electricity generation instead of payments at the rate of 5.7 cents per kilowatt hour. So they've had something like 14 projects that they've approved.

Moving on now, the California Department of Food and Agriculture has a rice straw utilization grant program. And it provides grants for up to $20 a ton for the use of agricultural biomass in some kind of processing for generating electricity or for manufacturing or other kinds of environmental performances such as controlling erosion. It has a maximum award of $300,000. And they're funded at a level of about $2 million. And that's, as I said, through the California Department of Food and Agriculture. And there's also a website there where more information can be obtained.

There's a program that has, rice straw tax credit program which is trying to encourage uses of the rice straw left over after the rice harvest. There's up to about $400,000 in credit can be awarded each calendar year, and this

sunsets in 2007, to entities that purchase California rice straw for such uses as biomass energy or construction. The credit is against the net tax in an amount equal to about $15 per ton of rice straw used.

The California Pollution Control Financing Authority. This is a step away from the kinds of grants and payments that we've been talking about. They provide loans through the small business pollution control tax exempt bond financing program.

They are in the range of $1 million up to $20 million for pollution control projects. And they have defined that as including waste to energy or biomass resource recovery. And the idea that using the waste to generate electricity controls the pollution that waste would otherwise have created.

And this is through the State Treasurer's Office that you can find information. They were very instrumental in the early to mid '80s in getting waste energy plants sited in California.

The California Integrated Waste Management Board once again has a different take

on it. They have purchase preference programs. There is a program called state agency by recycled campaign, and that requirements on state agencies to buy recycled content materials when the price meets certain criteria. That means recycled paper. Caltrans is supposed to use recycled materials like along roadways for erosion control and, you know, grass seeding.

And the Waste Board actually tracks what is bought and purchased. They have, for private entities, or local governments, environmentally preferable purchasing program where they list the kinds of materials. They have a directory under (inaudible) that's available for both these programs. The entity can get their product listed with the Waste Board as being recycled content, and then it can be accessed by the state or local agencies for purchase. And there's a website there at the CIWMB for the recycled program.

The California Public Utilities Commission has a self-gen program which is self generation. It encourages customer-owned, grid-connected renewable and distributed generation systems. And this is an attempt to get folks, you know, sort of generating electricity during times

of need, and then feeding it into the system.

Instead of payments of $1 to $4.50 per watt, depending upon the kind of technology, and it covers things like fuel cells, microturbines, small gas turbines, IC engines, if they're operating on renewable fuels, up to a capacity of about 1.5 megawatts. And more information on that is available at the PUC website.

And the net metering is something that right now is available for the dairy biogas systems sort of on an experimental basis. It credits customer-owned generation capacity at the retail electricity price. The idea is you use electricity during a certain period of time that your system generates it all, and it will meter it back into the system or go through your meter in such a way that it can read and pay you credits.

So what does this all mean? If you look at the different pieces that the state has in ways of providing incentives for biomass, there are some programs that provide support for research efforts, the PIER and energy innovations grant.

There are some programs that help with capital outlays, construction costs, operation costs, you know, whether it's a grant a loan or a

rebate. And these are emerging renewables, dairy power, California Pollution Control Financing Authority loans and such.

There are programs that help with fuel purchase, so some of those have sunsetted.

There are programs that do provide funding through energy payments; for the energy you generate there is some kind of supplemental energy payment.

There are also programs that help with requiring entities to purchase the product that is made, whether it's through a renewable portfolio standard, through the net metering system, or through something like the state agency buy recycled campaign. And there are some tax credit type programs.

So the question is does this cover the needs of the industry. I'm not sure if you caught Secretary Desmond's presentation a little earlier, but he had a phrase that I liked. He said that the state needed to create an environment conducive to the development of biomass.

So I think we need to look at well, what do we have, and what are the gaps. It seems to me that a lot of the feedstock processing has not

been adequately examined, you know, whether or not materials going to entities that do something other than generate electricity should be eligible for these sorts of incentives. Right now it seems to focus only on the electrical provider.

I think long-term commitments are a really big issue; that so many of these programs seem to be started on an experimental phase, so they last for a year or two, see what happens. And then no one picks it up again.

And I think the funding levels really need to match the costs of feedstock operation and et cetera.

So, one of the things I would like folks here to do; in your program you were given a light blue sheet, it's the Biomass Collaborative survey form for this year. Question number 10 is on financing mechanisms. We'd really like to hear from you what sort of creative ideas you have on what might be something the state could pursue to help get this industry going.

And that's all I have.

(Applause.)

MR. MATTESON: Thank you, Martha. She's representing our staff today. She's the only one

of the group that is making a presentation. She did very well I think. Very complete.

Our next presentation is going to be made by Bill Hagy. And Bill is coming to us from the rural business cooperative service business programs. And he's the Deputy Assistant Administrator for that program since July 1996.

He's been administering a combined loan and grant for about $6.7 billion. And he does have a budget for this current year which is around 1 billion. This is done through an organizational structure that has three national offices and 44 employees.

Through the years he's gained some experience and some training in financial management, and along the way he's picked up two nice awards. He's the recipient of Vice President Gore's National Performance Review Hammer Award for his efforts in streamlining the business and industry guaranteed loan program.

And he has received the Secretary of Agriculture Honor Award in 2003 for superior service to the Department in delivery of business service programs.

I'm delighted to have Mr. Hagy talk to

us today about federal financing for biomass development through the U.S. Department of Agriculture's rural cooperatives program.

(Applause.)

MR. HAGY: Thank you and good afternoon. I'm tickled to death to be here with you today. When I left Washington, D.C. yesterday morning it was beginning to spit snow with a forecast of eight inches before night. So this is a treat to be with you today. The weather is beautiful outside.

As you're aware, an integral part of the President's energy policy is renewable energy. And within USDA we have a variety of programs to the Farm Bill and other segments of USDA that support renewable energy in rural areas.

Now I stress rural areas, because our agency being (indiscernible) administration, we have a rural mission. We do not provide assistance in urban areas and I'll try to define what a rural area versus an urban area is a little later in the presentation.

The 2002 Farm Bill, and if you're familiar with the Department of Agriculture we have a farm bill every five years. We're always

starting on the next farm bill. The last farm bill was passed in May of 2002, and in that farm bill it had title 9, a new title of farm bill, and that title was renewable energy.

There was a variety of authorities that was authorized under title 9. Some of those authorities have been funded, some have not. And I'm going to share with you today two or three of authorities that were funded through the farm bill. And also, time permitting, share with you some other programs that we have within the USDA, especially in the mission area that I have responsibility for, that has supported renewable energy and specifically biomass development over the past several years.

First of all, what is renewable energy? It's biomass, geothermal, hydrogen, solar and wind. It does not include hydro. There's a long story behind that. But it does not include hydro.

I'm going to flip -- this is an old presentation, I'm going to flip -- that was -- the 9000 (inaudible) authority has not been funded, so I don't think there's any reason of us talking about it at this point in time.

The authority that I have direct

responsibility for is section 9006. That's renewable energy systems and energy efficiency improvement program. What it is, it is a nationwide program of loans, grants and loan guarantees that are to assist farmers and ranchers and rural small businesses in purchasing a small -- - in purchasing renewable energy systems and doing energy efficiency improvements within their business.

Now you may be asking what is a small rural business. We've adopted a definition of small business from the Small Business Administration. If you follow the SBA they have a definition for each type of industry that they deal with. It's tied into gross revenues and numbers of jobs. And about 80 percent of all businesses in the United States right now meet the definition of small business.

So we have adopted their definition as our definition of small. Rural, it's any unincorporated area and any incorporated area, such as a city and town of 50,000 or less. Any incorporated area greater than 50,000 and urbanized area around that city is considered urban for this program and a variety of programs

that we administer.

General provisions of this program. The grant cannot exceed 25 percent of the total project costs. Again, this is acquiring a renewable energy system or doing energy efficiency improvements. The combined loan and grant cannot exceed 50 percent. You may ask, where can the match come from. It can be another federal source; it cannot be another federal grant source. It can be another federal loan source; it can be a state source; it can be a private source. It can be cash provided by the applicant. And we do consider some in-kind contribution as going toward the total project cost and the matching funds for the projects.

How do we go about administering this program. It's been in effect for two years. It's a partnership. We either need very little or have no -- expertise within the department, especially our part of the department with regards to renewable energy.

So, within the USDA we formed the partnership between rural development, the farm service agency, which a lot of you are familiar with, the natural resource conservation service

and the forest service and our sister department, the Department of Energy, John Ferrell's group, and the EPA, the AgStar group within the EPA.

What this group has helped us do, they've helped us with the program awards, the regulation development, the outreach and evaluation of program activities. The Department of Energy and EPA have done the technical reviews for these awards the last two years. And I envision they will be doing the technical reviews for these awards for many years to come, because again, we do not have the technical expertise to administer the department without technical expertise from EPA and DOE.

To give you an idea of the activity for our program, and again it's been a program that's been in effect for two years, this just shows the awards for 2004, of those kind taken -- you can see a part of it up there, committed to the future of rural communities. I apologize for that. But it is the combined totals for 2003/2004. There's 97 biomass for that amount of money. The 73 of wind; solar of 8; geothermal 2; hybrids is a combination of one or two, two or three of the above. Total 184 awards made over the last two

years for $41.2 million for system acquisitions.

For energy efficiency, 97 awards have been made for $3.3 million.

Now within California, you probably want to know, how many of these awards were made within California. Five of the biomass, five of the 97 biomass awards were from California, and they were anaerobic digesters. And I think most of them went to individual farmers to assist in developing an anaerobic digester on their farm. And there was one solar award. So there's six out of the 184 awards for systems came from the State of California.

By the way, this is a very competitive process. There is a lot more demand for the program than there is currently dollars available. Just as John Ferrell indicated this morning at DOE. A lot of competition for these dollars.

For 2006 there's $22.8 million in discretionary funds available. We are going to award you some (inaudible) this year. $11.4 million will be a grant-only program. For the last two years, in 2003/2004, it's been a grant-only program for the full amount of money available; that's been around $23 million each

year. We're going to do it in two this year, 11.4 million for a grant program.

The notice of funding availability for that grant program will go out in mid March and will give applicants approximately 90 days to apply. They have a window of opportunity of 90 days. At the end of that 90 days we will working with the Department of Energy and EPA, and then review the technical aspects of it, we'll review the programmatic aspects of it, and make the awards hopefully sometime early September if not late August.

We are developing the final rules this year that will -- the program will become permanent, and upon the publication of this final rule it will be a grant again, and a loan guarantee program. We anticipate having the regulation in effect by mid July. And we are setting aside $11.4 million of the authority this year for a guaranteed loan program.

That $11.4 million equals about $600 million of loan level for this program. If we do not use all the funds for the guaranteed program this year, it will be used under the grant program. We will not lose a dollar of these funds

because they're only available this year; they're lost if not used.

The guarantee program is a unique -- which is a partnership of us and a lender. The lender actually makes the loan. They originate the loan, process the loan. They close the loan and we, a federal agency, provide a guarantee on any loss that might occur on that loan up to 80 percent.

Another program that was reauthorized in the 2002 farm bill is section 9008. The purpose of it is to support a research, development and demonstration of biobased products, bioenergy, biofuels and biopower. And you see the list of eligible recipients. There's a long list of eligible recipients. Institutions of higher learning, national laboratories, federal research agencies, state research agencies, private sector entities, nonprofit organizations or a consortium of two or more of the entities described above.

There is a matching requirement of 20 percent which most federal programs now these days have matching requirements of a certain percent. And a budget outlook of about $14 million of USDA and $1 million, I understand talking to John

Ferrell, available through the Department of Energy.

This is a program that is administered jointly between the two departments. Last year the Department of Energy had the lead on the program. This year USDA. The solicitation has already happened and closed. In talking to John earlier today, there's been over 600 applications received. So the competition for these limited dollars are going to be very very keen. And John, if I remember correctly, I think it's about 25 or $24 million total available last year. It's around 15 million this year. So there's been a cut in funding. And the application activity is up.

Another program that I have responsibility for administering is called a value-added producer grant program. The farm bill reauthorized this program. It's a pilot program leading up to the passage of the farm bill. And this program's purpose is to assist marketing of value-added products.

Eligible recipients, independent producers, agricultural production groups, farmers, ranches, cooperatives who own majority-

controlled, producer-based business ventures. That would be such entities as LLCs and et cetera.

There's a funding level of about $15.5 million this year. There is a grant limitation of $500,000 per award; and smaller grants will be given priority points this year.

There's a huge demand for this program. We anticipate that the solicitation for applications will be out sometime in the spring. And last year there was about $5 of application for every $1 available under this program. So, again, a lot of competition for it.

Now, briefly I'd like to spend a few minutes with you talking about other programs that have been around for several years that are supporting renewable energy, and specifically biomass development.

They're broken down into two categories, commercial vending and revolving loan funds and technical assistance.

First of all I think it's very important that again I emphasize our programs are targeted to rural areas. Here on the screen we have the definitions of rural area, depending on the program.

The business and industry program at the top, the rural business enterprise grant program and the rural business opportunity grant program are tied into the rural definition I gave you for section 906, any unincorporated area and any incorporated area of 50,000 or less.

And the intermediary -- program which is a revolving loan program, a 1 percent program for 30 years, there is no statutory definition for it. But we have adopted a regulatory definition of any unincorporated areas and incorporated areas of 25,000 or less.

The rural economic development loan and grant program is a program that's a partnership with rural utilities, the rural electric and rural telecommunication -- in which we provide assistance to those entities to provide economic and business development. And their definition of rural is anything that's not urban, as defined by the Department of Census.

So as you can see we have no one definition of rural.

First of all, the rural business opportunity grant program. Eligible entities, public bodies, nonprofits, North American tribes

and cooperatives.

What does it do? It's a very broad authority; it's been around since 1996. And it's technical assistance for business development and economic development. It has been used to date by planning, it's been used to develop market studies and feasibility studies for biomass ventures throughout the United States.

The rural business enterprise grant program. It's been around since 1985. And it is a program again who the eligible recipients are public bodies, private nonprofits and Native American tribes. And it can be used for a variety of purposes including revolving loan funds. But the important thing here is there's no payback to the federal government. As the money comes back in, as the loans are made, we pay the O&M. The money left over goes into the revolving fund for them to re-lend. This is a very popular program.

And in addition to the revolving loan fund, it has been used to develop market studies, feasibility studies for a lot of biomass projects nationwide. In addition, it can be used to fund working capital. It can be used to acquire real estate, acquire land to build the facilities on.

And infrastructure development to the facilities such as water and sewer, fiberoptics eventually for the business that's being located.

The rural economic development loan and grant program again is the eligible entities are rural utility and telephone borrowers. And I know here in California you have several rural utility borrowers that are actually borrowers of a rural utility service within USDA.

These borrowers are the only ones that are entitled to be recipients of these funds. A maximum grant of $300,000 can be available to the utility; a maximum loan, zero interest loan of $740,000 can be awarded to a utility. We can award a loan and grant combined to a rural utility, so that's over a million dollars we provide the utility. They're required to -- zero interest the first time. As the money comes back in, if it's a loan they pay us the zero interest payment. If it's a grant, it's establishing revolving loan fund. And as the money comes back in it goes in the revolving loan fund, they do not have to charge zero interest anymore. They can charge a higher interest rate, which will help, you know, rejuvenate the revolving fund.

Very popular program. This is a program you're going to be hearing a lot more about in the USDA because of the 2002 farm bill providing a vehicle for a considerable amount more of funding. And the funding for this program is not discretionary funding. That means it's not planned to the annual cycle that we have to go through with Congress. It is a self-sustained program.

Commercial lending. This is our flagship program. Last year we had over a billion dollars in this program alone. And this is our business and industry guarantee program. Eligible entities are individuals, corporations, cooperatives, partnerships, basically any legal entity, and I stress legal entity, can be an eligible recipient of this program.

It's a partnership with the bank. The bank makes the loan and we, the federal government, provide a guarantee on that loan. And if the loan, there's losses resulting in making the loan, then we would pay up to a certain percent of the loss. This limits exposure of the lender, and this is a very popular program.

It can be used for working capital; it

can be used for machine and equipment; it can be used for purchase of buildings and real estate; it can be used for startup businesses as well as existing businesses. It cannot be used to finance a business that is still in the research and development stage. We are looking at businesses that are ready to go to commercialization of their product that has been under R&D.

This program has been used considerably to support renewable energy. Of the 82, and as of I think last week there's 82 operating ethanol plants in the United States, eight of those plants have received financial assistance through the program.

This chart shows you over the last four years the amounts, the dollar -- the awards and the dollar amounts of these various programs I just described to you that have supported renewable energy development, and about 99 percent of this is biomass type renewable energy development, with ethanol leading the way. And some biofuel, biodiesel.

This is our funding for this year. You can see the dollar amounts. I mentioned B&R program had a billion dollars last year. We have

only $600 million this year. We're going to run out of money probably as early as July or August this year. Next year the President is supporting almost a billion dollar program again for the B&R program. But we are going to have a shortfall of cash or money available for this fiscal year. So this shows you the funding proposed for this year.

How do we deliver our program? We're a very decentralized agency. There's about 500 employees that work in the national office totally with the new development. There's about 6000 employees that work nationwide. We have an office in Davis. We have offices in counties and areas that you live and work in.

Most of the authorities that I described to you, the funds are allocated to the state offices, and they have the authority for making decisions at the state level of the awards. Now, some of the program, because of the amount of funds available is just not -- we just cannot allocate the money, just not enough money to allocate to the states, so there is a national competition for those funds. And the section 106 is an example of that. That is a national competition.

How do you learn more about our programs? Go to our website. There's a lot of information on the website about our programs, about the energy programs. There's a link to the Department of Energy and to EPA's programs with regards to renewable energy, along with other programs that we have. And I encourage you to visit our website and become more familiar with our programs.

About the end, and you know, I've given you the phone number of our state office here in California. This is our state office in Davis. And they will be more than glad to answer any specific questions that you might have about any of the programs I've described today. And their phone number is area code (530) 792-5800. That's (530) 792-5800.

Thank you for your time.

(Applause.)

MR. MATTESON: Thank you, Bill. Very complete.

Okay, we're moving on to coming back to the State of California. And I'm delighted to introduce to you a member of the California Energy Commission, Pierre duVair. Did I do that close?

And Pierre started out getting himself trained at UC Davis. And he took a PhD in ecology. Interesting PhD title, it was "The Methods to Determine Nonmarket Monetary Value of Natural Resources and the Many Different Types of Services that Natural Resources Provide." I think you'll find in his presentation that his training is carrying through.

He worked for about eight years for the California Department of Fish and Game. And had the responsibility for leading interdisciplinary assessments of natural resource damages. He also did some pollution incident managing and assessment.

He then moved to the California Energy Commission; became the manager of the climate change program at the Commission in February 2001. And in his current responsibilities he's in greenhouse gas emissions accounting, inventory protocols, climate change policy development and analysis. He leads the Commission's effort to provide technical guidance to the California Climate Registry. And that is why we invited him today.

Let us welcome Pierre.

DR. dUVAIR: Thank you very much for that introduction, Gary. Good afternoon, everyone. I'm the last speaker on the last panel so I guess it's my job to torture you one last time. And hopefully cannot put you to sleep on the exciting subjects of accounting and economics, even if it is related to greenhouse gases.

It's an interesting area, climate change. It crosses pretty much all of our divisions at the Energy Commission. We at the Commission have been looking at climate change since the mid '80s or so, late '80s. Been doing a statewide inventory of greenhouse gas emissions. And now we have within our PIER research program an awful lot of research going on on that climate science side of things.

So, I thought I'd find out, make sure that everybody knows that global warming is all about that hole over the Antarctic, right? It amazes me when I go out in the public how many people get things like the ozone layer and global warming confused.

And I think it's a little unfortunate that a lot of the public gets their science from Michael Crichton more than they do the IPCC. But

such is our world right now.

This really is climate change here. It's a lot more about rapidly retreating glaciers like this one in Austria; 130 years you can see how fast that one's moved. There's at least an Arctic study out, I think we heard about that earlier possibly, that eight nations documenting the rate of change in the northern latitudes. And it's pretty amazing.

I'm here to talk about greenhouse gas accounting, though, not the climate science, which is definitely a lot more fun. But the Registry is a creation of the State Legislature. It's a nonprofit organization. They allow their members to voluntarily record their greenhouse gas emissions. It was created in state statute by Senator Byron Sher back in 2000, and it's in the California Health and Safety Code.

It's a public/private partnership to encourage emission reductions in its members. I think the theory is if you can inventory and you know what you're emitting, you can then learn to manage it.

It's kind of a unique creation. It's a nonprofit that was called for by the state, so.

The State of California is committed to giving appropriate consideration to all of the certified results of the members of this Registry if they follow the protocols and get them independently certified. And should we have a greenhouse gas constrained future, these reductions that can be documented through the inventories of these Registry members will get some consideration for early action.

The Registry has a number of goals. One of them is to insure that their members are building and creating very accurate entity-wide emissions inventories. That's probably their primary goal.

They also are very interested in influencing the international and national debates around registries. There hasn't been any standardization yet of how to go about counting up all the different greenhouse gas emissions, how to set boundaries and all that. So the Registry --

MS. GILDART: Sorry to interrupt you. They've lost the screen. They're working on it in the control room. It's an EnergyStar energy efficiency thing. It shuts off after a certain amount of time.

(Laughter.)

DR. dUVAIR: I'm going to have some words for my Air Board friends here.

(Laughter.)

MS. GILDART: -- rehook, so I don't know if you want to continue or wait a couple --

DR. dUVAIR: We could take some questions for our first two panelists maybe, if you want to do that. It's usually a little helpful to follow it.

MS. GILDART: All right.

MR. MATTESON: We'll ad lib here a little bit then. Are there any questions for -- well, we can actually reach back even further, because we didn't take questions for the first group. If the presenters are still here we could still entertain questions for them.

But are there individuals who would like to address first for Martha Gildart's presentation or Bill Hagy's presentation, if you'd like to come on over to the mike and give us your name and we will go forward.

MS. PERRY: Good afternoon. My name is Heidi Perry; I'm the Community Liaison with the Lassen National Forest.

My first question is for Martha. You mentioned about the self-gen program. And it was, that's the one with customer-owned systems and rebates for customer-owned systems.

And a few years ago we were having some trials with selling energy back to the grid for a couple of small systems, and so my question is is there anything in place in the state now that we have a memorandum of understanding to sell power back to PG&E or PPNL, or whoever the big grid owners are?

MS. GILDART: As I understand it that's not in place yet for all systems. It is something, though, that's being advocated. I think it's just certain digesters.

MS. PERRY: Okay. And second question I have, if I may go ahead, is with Mr. Bill Hagy, and you mentioned the rural business opportunity grant, and you mentioned that public bodies were eligible. What exactly is a public body? Can that be like a high school, a county school system? I mean could you just elaborate on that for a little bit?

MR. HAGY: A public body would be an entity that is recognized under state statutes as

a state type of organization, or a city or town is considered a public body, too, by our definition. So a school district, depending on how they're organized, could be considered a public body.

An economic development arm of the State of California could be considered a public body. It's a very broad definition.

MR. MATTESON: Thank you for those questions. Are there any others for those two speakers?

Okay, we'll reach back into the prior group which had Fernando Berton, I don't know whether he's still here. John Sheehan and Ken Krich are here. Mark, are you here? And Doug, are you still about? Good. Okay, so if you have questions for Ken Krich or Doug Wickizer, or have any -- yes, we have one. Good. Come down.

DR. HUGHES: I think this is for Doug. Regarding the California program and the southern California insect, I was trying to relate the number of tons to the $225 million, and came out with a (inaudible) dollars per ton number. I thought I was using the wrong number of tons. Do you have that number to get some idea of how much this program paid per ton?

MR. WICKIZER: It didn't pay on a per-ton basis. It was not a per-ton basis paid. It was funding that went to the local government. It was grants that came from, in the case of the USDA/ Forest Service, it went to the counties, themselves, and then they funded within local government grants to those that did the actual work or removal.

There was also a good share of the money that was considered matching for that grant came out of the work that was done by Southern California Edison in removal of trees that were hazardous to their lines or to residences where they had service hookups.

So, there was no per-ton basis. It was actually just a lot of money funneled into local government to resolve a crisis situation.

DR. HUGHES: Do you know what fraction -- I think it was 2.8 million tons. Do you know what fraction of that got removed or thinned out?

MR. WICKIZER: There is a report that will be put out by the USDA/Forest Service. There was a consultant obtained by them to do a followup report, which will be released in probably a month. And that would be available through their

San Rafael office, through Bruce Goins.

The direct answer is somewhere between 10 and 20 percent. There was a couple of interesting things that did happen in that removal process. As tipping fees increased at the local landfills, it became more advantageous for the landowners to go ahead and take a loss on selling the logs and shipping them north.

So there's a little less in avoided costs that was learned out of that project.

MR. MATTESON: Any other? Oh, good, please proceed.

DR. CALDWELL: I'm Jim Caldwell from E3Regenesis. Question for Ken Krich. You were talking about dealing with the digestate after the biodigestion process is done. And reapplying it to the soil.

And one of the issues, I know, with just direct application of the manure to soil is phosphorus and potassium overloads the soil. And needs to be managed according to what's in the soil already and how it's needed.

If you take a biodigestate and put it out on the soil wouldn't you have the same problem?

And I think there are some other uses for that digestate that could be reprocessed. But --

MR. KRICH: I'm afraid that's not something I'm very knowledgeable about, so sorry.

DR. CALDWELL: Okay. Thanks, anyway.

MR. MATTESON: Please come to the mike.

MR. REESE: Hi, Phil Reese from the Biomass Energy Alliance. Question for Mr. Wickizer. You slides said that in the three southern California counties that have the dead tree problem you took out between 700,000 and a million tons.

MR. WICKIZER: That was 2004 only.

MR. REESE: My question is what was done with all of that?

MR. WICKIZER: That's the part we didn't put into the explanation. Again, that'll be part of the report by the U.S. Forest Service. But roughly the majority of it, the higher value material went north to several of the sawmills in central and northern California.

There was a lot of the material that was used locally for pellet stock, compost, firmaculture, a lot of low-value products. There

was fuel wood, of course. Kind of a mix of products that came out of that.

A good share of it, initially I'd say probably 5 percent of it at the end was put through the burners. They had air curtain burners that went up in that area that the local landfill or waste management districts were using to dispose of that material. And they disposed of around 250 to 600 tons a day for the initial month to two months that the action was started down there.

Soon that became too much of a burden for those local waste management districts to handle; it had gone up to somewhere around 1500 tons a day. And at that point is where that avoided cost point I mentioned to you, where they raised the tipping fees. And the tipping fee was sufficient to force some of that material back into the dimension lumber market.

MR. REESE: But the slash was simply burned in the open?

MR. WICKIZER: The slash was treated otherwise. That could be chipped and distributed. It could have been piled and burned under the right weather conditions. Or it could have simply

been scattered. And that would have been dependent upon the individual landowner.

Now, you have to ask the individual forest also, as to what their choice was in treating their slash or debris.

MR. REESE: The point of my question was we've talked for some time about the possibility of using the forest thinnings in the generic term as fuel for biomass plants to turn into energy.

MR. WICKIZER: Um-hum.

MR. REESE: I gather from what you said that none of this was turned into energy.

MR. WICKIZER: There was a good share of it that went to Delano and to the Imperial Valley plant. I forget the name of it. The Colmax --

(Parties speaking simultaneously.)

MR. WICKIZER: But the material that was hauled there was delivered for zero value. It was zero value fuels to those facilities. And as I said, it was again a cheaper means of disposal.

MR. REESE: Okay.

MR. WICKIZER: Than using -- paying the tipping fees.

MR. REESE: Right. Those facilities paid the transportation costs, yeah.

(Laughter.)

MR. REESE: Okay. Thank you.

MR. MATTESON: Any other questions? I noticed Fernando Berton has joined us. And if you have any questions regarding the Integrated Waste Management Board's -- sustainable vision, you might raise them at this time before he walks out the door.

If not, that looks like we've completed our questions. I do have an amendment or an addition to a response that was addressed to Ken Krich. Do you want to address that? Our Executive Director may have a few words on that.

DR. JENKINS: I'll just say a few words. There was a question about application of digester digestate to the soil. And I think the Dairy Manure Collaborative is addressing this with Jamie Liebman's group out of San Francisco EPA, is that correct, Ken?

So I think if you wanted to talk to Jamie that that would be an answer to that question. I think there are some potential improvements that would occur as a result of that. But there is some further information that is available, and if you want to talk to me

afterwards I'll try to get you a reference to that.

Dara wants to address that? Sure.

MR. MATTESON: Please give your name and then go ahead.

MR. SALOUR: Dara Salour with RCM Digesters. And I just wanted to address that briefly. Yes, the nutrients do need to be accounted for when they are applied to the soil.

However, the digestion process does pre-mineralize the nutrients so that they're no longer in their organic form and they're more easily taken up by the plants.

To what extent, we don't have enough data on that, as yet. But it does have some effect.

However, it's important that a dairyman have a nutrient management plan for application of their digestate to the land that they have and that they're using. Thank you.

MR. MATTESON: Thank you. As you can see, our EnergyStar computer has revised its program.

(Laughter.)

MR. MATTESON: And we are now ready to

proceed with our presentation.

DR. dUVAIR: A round of applause for the technicians here. Well, modern technology can come through on occasion, so.

As I was talking about some of the goals of the Registry, and again this is a voluntary nonprofit organization that was created by the State Legislature. They're there to try and help organizations figure out their total level of greenhouse gas emissions. They've developed protocols, and I'll get into a little bit more about the protocol development process, and what types of protocols they have.

But I was mentioning, they're also very interested in influencing the international debate about greenhouse gas accounting, which is still evolving fairly rapidly. The Registry is interested in promoting a consistent approach to reporting greenhouse gas emission that a number of states are looking at registries at the state level. The federal government has, through the U.S. Department of Energy, the 1605(b) program it's called, they've been taking voluntary emissions reporting since, I believe, 1994, '95. So it's probably the longest running greenhouse

gas registry there is.

And so our state registry is interested in coordinating with other states and federal and international organizations on standards.

And then finally they're also interested in trying to recruit a diverse membership, everything from cement compounds, the large greenhouse gas emitters down to the small, you know, just office-based businesses and the mom and pops. So it's a pretty big goal to try and develop protocols that work for, you know, grocery stores and then British Petroleum.

But they want to try and reach all types of organizations throughout the economy. Energy is used by everyone, and the more that all sized organizations know their emissions, the more they can manage and potentially reduce.

If you decide to join the Registry you have to report your entity-wide greenhouse gas emissions. And there's really two levels of reporting. It would be all of your activities were in California, or your U.S.-wide. And then there's interest in global emissions reporting. There's a lot of desire to try and capture the whole entity, and not just pieces of the entity in

terms of their emissions.

You have to report CO2 the first three years. And it gives you some time to work on your emissions of the other greenhouse gases that are covered in the Kyoto Protocol, if you've got them, methane and N2O and some of the HFCs and PFCs, things like that. So start off with CO2 and then you've got to pick up the other greenhouse gases.

The Registry has developed some protocols and you've got to create your inventory according to those protocols. And then you have to have it independently certified by organizations that are approved by both the state and the Registry.

Here's a list of some of the members. It may be a little too small to read, but my organization is up there. And we have, I think, a whopping 31 tons of direct emissions, which is not very big. It's I think five cars that the Commissioners own.

(Laughter.)

DR. dUVAIR: And some of them don't keep very good records, in fact, I think we failed our 2002 inventory because one Commissioner didn't keep real good records. So, it's pretty

challenging actually, and you can get at your mobile fleet emissions through either the mileage on the vehicles or the fuel. So you've got two ways to get at it. But you've got to either know the miles or the fuel use.

But in this list you can see, this is only a partial list, there's some small ones and some large ones. British Petroleum and Southern California Edison would be some pretty large CO2 emitters. And then you get some small office-based groups like NRDC and the Better World Group. So they mostly, the small office space, had indirect emissions through the electricity they consume.

This Registry does look at both direct and indirect emissions, which is one of the more innovative parts about it.

The Registry has developed some forestry protocols that Doug Wickizer from CDF is intimately familiar with, a lengthy process. And a lot of technical experts participated from a number of stakeholder groups.

The types of projects that the protocols address are reforestation, conservation-based management, and then straight conservation. And

if you have questions on these protocols we'll bring Doug up to help explain it. Because I didn't participate as much in that protocol development effort. And it is a fairly complicated protocol to tackle first to get into the whole carbon cycling and baselines and things in the forestry sector.

But they've got a protocol that's out on the street and ready for some trial use by members. I don't think they've got anyone yet. Hopefully someone like Mendocino Redwood, I know who was very active in the protocol development, might try and test the protocols out.

Now the state statute which was Senate Bill 812 called for just California forestry projects only. I think there's some interest, if larger organizations come in, to broaden it beyond California forestry projects. You have to have a permanent conservation easement. You've got to promote and maintain native species. All of this is in statute. It's not the Registry, itself, but these were called for in legislation.

And then there has to be an additionality test. You have to be going above and beyond what the forest practices rules would

be requiring of you to record a project with these protocols.

The Registry has developed a power utility sector protocol, as well. The forestry and the power sector are what's called industry-specific protocols. They've got a general reporting protocol that fits any particular member. But then if you were in the power sector or the forestry sector you've got to use these additional guidance.

They haven't gotten to projects yet in the power sector, but they do have entity-wide protocol for the power sector. And it's both a reporting and certification protocol.

They've developed some efficiency metrics which should be very interesting. And the Registry is predominated now by both power generators and utilities. If you saw on the member list all of the three big IOUs and Calpine and some of the munis like SMUD have all joined. So, they've got great representation in this sector; this is a big emitter in California of greenhouse gases. Not as much in the rest of the country where there's a lot more coal, but nonetheless we burn a lot of natural gas with CO2

as a byproduct.

These efficiency metrics, they'll have to report what's their greenhouse gas emissions relative to their generation, as well as relative to the electricity they deliver. And that includes purchases to the extent they can find out what the GHG footprint is of their electricity purchases. And we do import about 20 or 30 percent. My understanding it's fairly challenging to try and get at the greenhouse gas footprint of imported electricity. But it's something that the Energy Commission is actively looking in, and we've had an interest in that area for a long time.

The additional guidance here is focused mostly on stationary combustion, process emissions and fugitive emissions in the power sector. But it also looks at indirect emissions from energy purchase and consumed by the generators and the utilities.

A number of protocols that the Registry would like to develop a whole lot of protocols. They're somewhat resource constrained. But some of the top priorities are they do want to get to a project-based protocol in the power sector. The

utilities are familiar that there's a --

(Laughter.)

DR. dUVAIR: Wow. Well, it's just got a mind of its own.

The utility power sector is one sector that's really fairly forward looking on future carbon constrained world, so they're very interested in protocols, standardized protocols for project-based accounting.

Landfill methane recovery, conservation tillage, solid waste management, dairy methane captures, cement, oil and gas, and in particular within the oil and gas natural gas transmission and delivery, are all sectors that the Registry would like to potentially move towards protocol development.

A lot of it will depend on the members that come forward and the types of funding opportunities to get for which of these protocol development efforts will move forward first.

A little bit about the carbon market. There are finally emerging carbon markets. The Chicago Climate Exchange is the U.S.'s version of a pilot program at greenhouse gas trading. As of January '05 here's some statistics for what's been

traded there. The high they hit is about $2 a ton, that would be a metric tonne of CO2.

Then if you look on the far right the volume only in the month of January trading about, you know, 65,000 tons of an '03 vintage, or 52,000 tons. So it's not a huge volume here in the U.S. being traded yet. But, again, it's a limited group that's involved with the Chicago Climate Exchange.

It was a pilot program started through the Kellogg School. They just wanted to try and, you know, we have experience with trading sulfur dioxide and NOx and a lot of companies wanted to get some experience and try it out. And the Chicago Climate Exchange is where that's happening.

Sometimes it likes to go and sometimes it doesn't. I think we're stuck. No, I'm trying both the arrow and the -- well, I'm not sure what to do here. Any ideas?

(Pause.)

DR. JENKINS: Can you finish without it?

DR. dUVAIR: I can.

DR. JENKINS: All right.

DR. dUVAIR: We've giving up on this

here. I'm just going to finish from over here. It's dangerous over there.

(Laughter.)

DR. dUVAIR: I've got a few slides here, and these are all, I'm sure, posted on the website. So if you're interested in these exciting slides, so they will be available.

I do want to mention that some states are moving into the greenhouse gas arena. The State of Oregon has a benchmark and offset requirement for power generation. And so when a new project goes in they've got to either implement some greenhouse gas mitigation projects, themselves, or fund the Climate Trust in Oregon to do it. And so they're actually a U.S. buyer of carbon reductions.

And one of the projects they've -- there's a list of websites that I have on the last slide, too, that will take you to some of these places. But the Climate Trust in Oregon, it is funding some reforestation and some riparian habitat in southwest Oregon. And there they're requiring the project developer to demonstrate the increase in the carbon stock on the 12 acres. They have to have a third party come out and

periodically verify it. They have to have an agreement on the real property so that if ownership of the property changes over, that they continue the project out 120 years. And that project is looking to, I think, sequester about 1600 metric tonnes. That's just one example of a state-level project where we have a state buying greenhouse gas mitigation reductions.

The largest arena, of course, is with the Kyoto Protocol and some of the flexible mechanisms under that.

Are we back again?

DR. JENKINS: You are back.

(Laughter.)

DR. dUVAIR: This is much like what the Kyoto Protocol was, it's on, it's off and --

(Laughter.)

DR. dUVAIR: -- it's back on. But the button might not be. There we go.

The clean development mechanism, many of you may be familiar with this. This is where that the industrialized countries that agreed to cut their emissions can be funding projects in developing countries that have these designated entities. And they can get the greenhouse gas

reduction credits and do less reductions at home.

And so that's one mechanism that finding where a market for greenhouse gas reductions is occurring. And, of course, there's also what's called a joint limitation where one industrialized country can fund projects in another industrialized country. I believe most of these are taking place in eastern Europe and some of the economies in transition there.

So those have been launched as officially February 16th, many of you may know, is when the Kyoto Protocol finally took effect, after it was started in 1997.

There's some basic steps toward measuring a project's greenhouse gas reductions. You got to do a project identification; figure out the boundaries of the project; how far upstream do you look in terms of, you know, where the reduction's occurring. A number of challenging issues, you know, what's the eligibility of a project.

Once you've sort of got the project well identified, then you need to get into the quantification of it. A number of tricky issues here with a lot of projects in terms of, again,

establishing the appropriate baseline, the appropriate levels of monitoring, a number of tests that you have to get at in terms of documenting that the project really is additional to what would have been done otherwise.

Then you move it up, monitoring and verification phase of a project. Varying levels of monitoring and verifying of those reductions. And then finally this official designated entity within the country that you're doing the project has to sign off that the reductions were real and did equal the verified reductions.

The CEM executive board approves these methodologies. And they've approved now, I guess, about 19 of them I saw on their website yesterday. They've got some approved methodologies for baseline and monitoring for biomass, in this case for replacement of what would have been uncontrolled burning. Manure management systems; landfill gas capture, the gas-based cogen, and then a variety of animal waste system improvements. That's just an example of some of the 19 methodologies they have approved.

There is an international organization by the World Resource Institute and the World

Business Council for Sustainable Development. They have what's called the GHG protocol. That's generally regarded as sort of the best approach. It's a fairly broad approach to the greenhouse gas accounting. The California Registry is based on these principles and tries to be consistent with these GHG protocols.

They have corporate accounting and then they have a project-based accounting. And they're still working on the project-based accounting. And some of the principles that WRI has for their inventories, whether it's a project inventory or an entity-wide, is that it has to be relevant. So that means they have to be the emissions of the entity for which the inventory is being developed. And that the sources that are measured have to be useful to the creator of the inventory.

Completeness is important, captured all your greenhouse gas sources and all your activities of the organization. That's where boundaries come in, as well.

Consistency, that you approach these sources in a consistent methodological that allows for comparison across different inventories or different companies that have the same sources.

Transparency. You really need an audit trail if you want to get credit for a lot of these down the road. Somebody's got to be able to come in and reproduce your results for documenting your assumptions, your emission factors, all of that goes into transparency.

And then accuracy. You don't systematically over-estimate or under-estimate the emissions.

The project-based protocol, which probably is of most interest to people here, biomass side of things, is still sort of a work in process. The key thing they're trying to come up with, is there a way to standardize or come up with a typology for different types of projects that reduce greenhouse gas emissions.

How to set boundaries for, you know, what belongs to a project and what changes can be directly attributable to a particular project. Establishing baselines. Again, what would the future have been without that project. And then additionality tests, you know, would that project have been done anyways. And then leakage. If this project gets implemented do the emissions just occur somewhere else.

And a couple more slides. Europe is where the carbon market really has taken off. Here's a graphic off the pointcarbon website. And it's hit about $12.50 a ton there. And you can see that the volume just in the last couple of months when Kyoto took effect -- the European Union has an emission trading system, took effect in January.

And so there compare $12.50 to what was trading on our Chicago pilot of about, you know, $1.70 or $2 a ton. And then the volume here, 35 million tons traded in one week. So the volume has really picked up there.

Just a few concluding points. Carbon markets are here finally. And they're certainly launched in Europe, and they look to be emerging; both Canada and Japan are very interested in greenhouse gas emissions trading and that flexibility mechanism, the Kyoto Protocol.

Some states are moving forward. They're funding offset projects. Others, like in the northeast, are looking at a cap and trade system in their power sector. And then project-based accounting for greenhouse gas reductions for many types of projects is still in its early childhood

or infancy. Not all these tons are, quote, created equal. And you really need to get to the bottom of the accounting that's gone into what a project really does do. But they're developing very fast.

And that's it.

(Applause.)

MR. MATTESON: Thank you, Pierre. Any questions for Pierre? Okay.

We'll move on to our wrap-up and summary.

DR. JENKINS: We have just a few minutes here if there were further questions for this panel or for the previous panel. Are there any questions?

Doug, if you'd like to come over to the microphone, please.

MR. WICKIZER: Yeah, Doug Wickizer for Pierre.

(Laughter.)

DR. dUVAIR: Be nice, Doug.

MR. WICKIZER: I am, I am. Just for example, for a little more specifics on how the accounting is working for bioenergy within the utility protocols, is it traded as a net zero

or --

DR. dUVAIR: Yeah, I think in the case of the IBCC protocols for the national inventories and I'm not exactly sure how it's handled in the 1605(b) program. I'm pretty sure that any biogenic sources are treated as not counted in your inventory essentially net zero because the CO2's just taken out of the atmosphere and just returned through biogenic sources.

MR. WICKIZER: In the California protocol does it, in essence, reduce the amount of GHGs produced per measure of energy?

DR. dUVAIR: I'm not following that question.

MR. WICKIZER: If you add zero to the emissions site and you're adding additional output to the energy site, your per-unit relationship changes.

DR. dUVAIR: You're going to have lower greenhouse gas emissions per kilowatt hour, megawatt hour produced from renewables?

MR. WICKIZER: Right, that's what I'm asking, is that -- how are they trading it in the California protocol.

DR. dUVAIR: Yeah, I think any kind of

biogenic source within biomass is treated as a zero. So that isn't counted. So, if Southern California Edison has a biomass facility they'll be counted, they won't count the carbon from burning that biomass in their inventory.

We've recommended to them that they track the biogenic sources of CO2 so that they at least know how much carbon they're emitting. There is a temporal aspect, you know, if you're taking a lot of that carbon out of storage off the landscape and then using it to make electricity, you're probably returning that carbon to the atmosphere quicker than Mother Nature would have.

But at least I think the standard protocols right now are to treat biomass as net zero.

MR. WICKIZER: Okay.

DR. dUVAIR: And I know geothermal's got some CO2, as well, emitted, and potentially a little bit of methane. So they're more challenging to try to figure out what the natural rates of geothermal resource emissions would have been versus the anthropogenic influence on those geothermal resources.

MR. JONKER: Yes, Pete Jonker of Kelly

Space and Technology. If emission reductions of CO2 could be verified, why would an American company that has reduced CO2 not trade in the European market? Why would they ever go to Chicago? It's six times the price.

DR. dUVAIR: Well, right now the U.S., if you're a company with just emissions and activities in the U.S., you're not party to the Kyoto Protocol, so that company wouldn't really be eligible to utilize the flexible mechanisms from the Kyoto Protocol, because we're not signatory to -- we haven't ratified the Kyoto Protocol treaty.

So our U.S. companies that have just activities in the U.S. don't need emission reductions under that international treaty. Now if you're duPont or something like that, where you've got a lot of factories in Europe, you're going to have some binding potentially commitments to reduce in Europe.

And there the problem is that reductions in the U.S. aren't recognized under the joint implementation, because we're not signatory to that.

Now, the one area where U.S. companies can trade is when a country has its own domestic

target separate from the international Kyoto treaty. And a number of countries do have that. And those countries may be willing to buy tons reduced in the U.S.

But, again, if they can't use it against the Kyoto target, and they're having a tough time reaching their Kyoto targets, they're not going to be buying emissions reductions from the U.S.

MR. JONKER: However, if they knew that the Chicago market is only two bucks, they might be getting a good deal. And CO2 is supposed to be a global pollutant, so if I'm a European company and I need CO2 credits I'd come to the United States.

I mean the fact that we are not a signatory to the Kyoto treaty shouldn't matter at all, if CO2 is truly a global pollutant, it doesn't matter where it's emitted. Right?

DR. dUVAIR: That's true. But, again, there's two big issues with that. The one issue is that the U.S. hasn't taken on -- well, we did sign on to reduce to 7 percent below 1990, but we haven't ratified it through the Congress.

So, our, you know, our reductions, we're not playing by the rules of the game for that

international treaty.

MR. JONKER: That's why I premise my question by saying if reductions could be verified, and if there's agreement on verification, it seems to me that American companies have an incentive to reduce their CO2 emissions whether we're signatory or not.

DR. dUVAIR: Yeah, absolutely.

(Parties speaking simultaneously.)

DR. dUVAIR: And that's why actually a lot of large, you know, power companies are starting to document, and that's why they've been reporting to the 1605(b) program since the mid '90s, because there may be some value in these reductions, whether it's against a future requirement to reduce in the U.S., or they may be marketable.

But, again, the second question comes to, you know, how well documented are those tons in the CCX versus how well they're documented, you know, in the European system or under the --

(Parties speaking simultaneously.)

MR. JONKER: -- probably the biggest hurdle.

DR. dUVAIR: And that will be the

biggest hurdle. CCX, and again, they haven't really made a lot of their verification protocols publicly available. So it's been kind of a -- it's been in development for a year or two, and then it's been kind of a black box to a lot of us who have been interested in how well documented.

But that's where the ton is not necessarily a ton, so.

MR. JONKER: Well, we got some work here.

DR. dUVAIR: Yeah.

MR. KOEHLER: Hi, Tom Koehler, California Renewables Partnership. How is the Registry dealing with mobile emissions? Or your thinking on that? For instance, today in California 6 percent ethanol, roughly 3.5 million tons of CO2 unaccounted for. No regulatory mechanism to account for that -- so I'm curious to know what your thoughts are on that.

DR. dUVAIR: The general reporting protocol of the Registry does require a member to estimate all of their mobile sources. They have what's called a de minimis, up to 5 percent of an inventory. And for somebody like SMUD or Southern California Edison, their mobile fleet next to

their generation of CO2, it's probably going to be de minimis.

But for many of the other companies their fleet of vehicles could easily be a significant source of their direct emissions. They have to estimate those emissions.

The best way to do it is from fuel use. There's a number of emission factors there where they can estimate the carbon from the fuel used.

Is your point that right now there's no easy way to credit additional use of ethanol?

MR. KOEHLER: Well, on -- it doesn't seem like there's a mechanism to take account for the fuel that is not necessarily being used in a company-wide fleet, but is being sold to the public. So, you know, today, call it 900 million gallons; tomorrow it could be more or less. But there's no mechanism to account for that CO2 impact.

DR. dUVAIR: Right. The one thing that these firms can do, if they develop -- or if they purchase say an alternative vehicle fleet, and they can document that they've cut their gasoline use and cut their carbon emissions by, you know, by some x percent, just by documenting by the

changeover in their fleet, if they went to an E85 fleet or whatever, they can quantify these. And then down the road again, this Registry, the state is going to give consideration to these early reduction actions. So they can get some credit.

MR. KOEHLER: Well, like, for instance, bp's a member of the --

DR. dUVAIR: Right.

MR. KOEHLER: Okay. So every day they're selling gasoline to the public, not their fleets but to the public.

DR. dUVAIR: Um-hum.

MR. KOEHLER: Where is that accounted for? And some of that gas -- most of it in California today has ethanol. Tomorrow it could have more ethanol, or it could have less. Where is that accounted for?

DR. dUVAIR: Well, right now it's not. And, again, most of these emission reduction requirements came from the past, like for the criteria pollutants, they fall on the direct emitter. And so the direct emitter of bp's gasoline is going to be the person driving that car.

And so ultimately it's going to depend

wherever the climate policy wants to go towards. There's some efficiencies to control greenhouse gases at the upstream level, at the refinery level, or the importation level.

Until those kind of systems are developed and we have much clearer direction on climate policy there is no mechanism in place right now to credit additional use in ethanol.

Again, like I say, for companies that want to get out in front, want to displace a lot of their fossil fuel use, to document that the reduction in their greenhouse gas from like an E85 fleet.

MR. KOEHLER: Right, right.

DR. dUVAIR: Yeah.

MR. KOEHLER: Okay.

DR. JENKINS: Thanks, Pierre. We're going to wrap this session up at this point and we're going to move on. I want to thank Gary for moderating the last session there.

Our wrap-up speaker is George Simons. George is program manager for the PIER renewables program in the California Energy Commission. And, George, do you want to come forward and tell us what we learned today.

(Laughter.)

(Applause.)

MR. SIMONS: Thanks. And I'll try to keep this short. I'm sure everybody would like to leave.

I do want to make a couple points. This is the second annual forum. In the first annual forum we got together and we learned a lot about what the potential was. And by the way, most of us have been doing this for a long time. I've been involved with biomass since 1981. So these are not unique forums, okay. We've heard a lot of this information before.

But, you know, in some instances this was really the first time it was focused specifically on California. We found out what the potential was. Of course, the potential in California is huge. There's 72 million bone dry tons per year of this stuff. And we don't really tap into it. We tap into very small amounts.

We learned in the last year's forum about what accomplishments we had to date. And we learned about some problems, okay. And we got some feedback from folks from that last year's forum. One of the feedbacks was that -- one of

the points was that you guys focus too much on power. You know, you're focusing too much on power production; you're not really focusing on bioproducts and on biofuels, okay.

We also got feedback tat one of the number -- the highest priority issue that we probably face as an industry is the fact that we don't have a state biomass policy, okay. We have conflicting regulations.

So in this year's forum one of the things that you notice we did is we created parallel sessions, okay. We are looking more at bioproducts. We are looking more at biofuels. So I think, you know, we are making some inroads here.

And we got the Governor's Office. You guys got the attention of the Governor's Office, okay. Last year's forum, I think, and the fact that people from the outside went to the Governor's Office and said we really do have a problem in California, okay.

So, Joe Desmond comes to the forum this year. And we are getting attention. And I think we're going to have some action out of the Governor's Office. This is the third time that

we've had a state agency working biomass group, okay. I think this time, third time hopefully is the charm.

I think there's a number of things we really have to address, but I think we're going to end up doing that.

Desmond talked about what occurred in the environment that's conducive to the growth and development of a biomass industry. He said it's not because special interests necessarily getting to the Governor, but it's because we're a virtuous cycle. I've heard biomass called lots of things before, I've never heard it called a virtuous cycle. But I think that's fine. I think we can wear that. I think that's very true. I think we are a virtuous cycle.

I think, though, if we're so virtuous how come we aren't making money, right?

(Laughter.)

MR. SIMONS: So maybe it's not so good to be virtuous, maybe you need to be a little bit on the dirty side to win the game here.

I had to jump between sessions, so I went over to the bioproducts side of things. And I walked into a really provocative presentation by

Kim Kristoff. He talked about the holy wars. And he was jesting, but he was talking about the conversations that would come up with his brothers-in-law who work in the petroleum industry.

And yet he made a very serious point about the fact that gasoline costs $6 a gallon to make. And yet it's $2 a gallon at the pump. There's something going on there, he pointed out, that we need to understand this in industry. We need to take advantage of it. We've got to level the playing field.

So how are we going to do that? You know, and this same point, by the way, was raised on a technical front by John Sheehan. It's the net energy that comes from renewable resources, it greatly outweighs what we get from fossil energy, five to one in some cases. But that's not recognized; it's not monetized.

So how do we level the playing field? And Joe Desmond said, well, you have ten points in the Governor's energy policies, and we have to build off those ten points. We have to somehow figure out how to make those ten points that the Governor is behind to really benefit the biomass

industry side.

And on the biopower side we heard that there's a number of developments that are ongoing that we can take advantage from. I was talking to John Ferrell. I sat just amazed at how much DOE is doing, you know. We take advantage of that stuff, but we don't take enough advantage of it.

Similarly, you know, we have small modular stuff coming up; we have landfill gas technologies coming forward. We need to somehow really capture those. To capture those things effectively means not just capturing the technologies, but capturing the economic benefits.

If we provide environmental and societal benefits, we need to be rewarded for that, okay. We need to capture that in some fashion that makes it profitable for the biomass industry in California to provide those benefits.

I think that comes back -- and I'm going to jump through some of the points I wanted to make because, again, I'm sure we all want to go other places. But, in order to really do that, to capture these things, to monetize them, we have to charge ourselves, and we have to charge this state energy biomass group with coming up with several

very critical points.

The first is that we have to really greatly reduce the delays and the hassles in deploying biomass projects and technologies across California. Again, I've been doing this since 1981. During the 1980s we saw the biomass industry in California leap from 50 megawatts to close to 980 megawatts. Tremendous growth in a decade. The growth that we've had in the biopower industry in the past five years has been minuscule, even in the past decade.

There's been some growth in landfill gas; there's some, you know, minor growth in digesters. But largely we haven't had the great strides that we had in the '80s. And, again, we are a virtuous cycle and we provide tremendous benefits; and we need to somehow make certain that we can create an environment that allows us to get those economic benefits.

And part of it is going to be figuring out how to reduce the hassles, how to reduce the delays. We have to set up, we have to reward versus punish project developers who provide benefits. So may have to come up with incentive programs that actually provide folks with some

sort of economic benefit and reward.

We have to set up simple and clear pathways that allow those benefits to be monetized. Actually right now, working in a state bureaucracy, you know, we're really good at coming up with programs to hand out money. And sometimes those programs have all sorts of hooks and barriers with them, regardless if they're incentive payments or some other sort of an economic benefit. They make it very difficult for people to move forward with projects.

Governor Schwarzenegger talked about blowing up boxes. This is an arena that's ripe for blowing up some boxes, I think. I think we also have to really get -- we have to have this working group establish very clear goals, very clear objectives that we can track, because I think again we have to come back next year, we have to come back in two years and we have to be able to say, this is what we've accomplished. This is what we set out to do, and if we really do provide benefits, then we need to be able to measure against what did we actually gain.

Now, I want to really end up then with talking about some points that were made by

earlier speakers. Again, Kim Kristoff noted that no plan is perfect. And we're going to have to seek tradeoffs. I absolutely agree with that.

You know, we are going to go forward under some sort of an agenda to make progress. And we will make mistakes, but we'll make progress.

And Doug Wickizer pointed out that we have to do it cooperatively. That doesn't mean project developer against regulatory agencies against, you know, whoever else is out there, communities. We have to walk hand-in-hand and try to figure out how to create a pathway to see a real growth in biomass in California.

And so I'm going to leave on that note, that again it's a cooperative pathway that we have to adopt. I heard a lot of that today. And I'm really pleased with that. I think we've made some modest accomplishments in terms of growth in the biomass industry, but I think the forum and the fact that we have a Biomass Collaborative, and we have a state agency working group is going to serve us very well in the next decade.

So, thank you.

(Applause.)

DR. JENKINS: Thank you, George. Stated elegantly, as always, of course.

And, you know, we come to the end of this day; we've learned quite a bit. There's obviously a lot of energy and a lot of enthusiasm for biomass and renewable energy in this state. And I think we need to continue doing what we're doing, which is many good things.

We have lots of things going on, lots of progress to be made. George mentioned the comment about $6 per gallon for gasoline. Why does gasoline cost $6 per gallon. You can imagine, I suppose. But if we're really going to provide incentives for biomass and other renewables, then maybe we ought simply to recognize what it is that renewables provide to us.

And we heard the ten-point program from the Governor's Office, Governor Schwarzenegger, if I can say it right this time. And with the Secretary's comments there very energetic, very enthusiastic again about trying to move forward on this front.

Commissioner Boyd's comments, and of course the reconstruction of the interagency working group. We look forward to seeing what

that will look like and how we work together with that. I think the Biomass Collaborative can provide a vital function in bringing together all of the other parties outside the state agencies to work with the state agencies and moving forward in this area.

And I'm all in favor of blowing up boxes. I think we don't need any more boxes. So, okay.

All right, --

(Laughter.)

DR. JENKINS: You know, I stand up here and I say a few words, but there are many people, of course, who actually do all the work. And I would like to express some thanks.

First of all to the Commission and to John Ferrell from DOE and to Secretary Desmond for coming in today and expressing their views on the big picture associated with this.

I want to thank all of the speakers who came in and spent their time creating the presentations that you saw, even though the machines like to do other things with them occasionally. But to provide us with a great deal of information and their best truth about biomass.

And I want to thank the speakers for that again.

Moderators kept the speakers on time. I think we're pretty much on time if I get done talking here and don't use too much of your time. I think they did a good job there, and I want to thank all the moderators for doing that job.

And then I want to thank the staff of the California Biomass Collaborative who worked very hard in the background area. You heard one in the foreground.

(Applause.)

DR. JENKINS: Thank you for that. Martha gave you a very nice introduction to some of the incentives that are out there. But there are many other people, too. Gary Matteson, who moderated the last session. He's the Assistant Director. Thanks, Gary.

Martha, thanks. Martha works on a lot of different things. Rob Williams, who moderated one of the sessions. He's a Development Engineer; works on the technical side, as well as trying to keep me straight, as they all do.

Hugo Von Bernath has been with the Collaborative since its inception, and where is Hugo? He was sitting somewhere here. Oh, there

you are, back there. Thank you very much.

And there's (indiscernible), his graduate student, PhD student working with the Collaborative. Sherry Blunk sitting next to him there is also a PhD student. She was taking some photographs today. I want to thank them for that.

Pei Lin Yang who may be hanging around here someplace. Is Pei Lin still around? Maybe he left. Has worked with the -- oh, there he is, way in the back. He worked very hard on -- residue report which we're getting out sometime soon.

Glenda has -- still here? Where -- oh, there you are. I have to look, as well. Maybe I need new glasses. Glenda was taking photographs today. She's taken quite a few. I hope some of them come out well, so we'll look forward to that.

Li Mei Yan is a programmer with the Collaborative. She does a lot of the programming you'll see on the biomass facilities reporting system. If you go there and look at that, that's mostly her work. And so she couldn't be here today, but I do want to thank her efforts in that regard.

Conference and Events Services from the

University provided excellent services always to help us get this conference put together. Teresa Brown and Jennifer Thayer were very constructive in that regard.

And Peters Reporting service, if I got your name not quite right, I apologize. Thank you for that.

And then, of course, the PIER program overall at the California Energy Commission has been very supportive, as have folks from the CDF, from the Integrated Waste Management Board, from the Air Resources Board, from Water Resources Control Board, and a lot of the other agencies involved have been very supportive in that.

And I do want to thank the Executive Board of the California Biomass Collaborative. We had 25 members of the Board, some of them are still here. And I do again want to thank you for the service that you provide to the Collaborative and a lot of the hard work, a lot of hours that are put in by the Board that the membership doesn't see in general. So, again, I do want to thank you.

And then not least, of course, but maybe last, just for you for being here and providing

the input. And I hope you do turn in your surveys to us, if you have not done that already. And if you take them with you, please do make sure you mail those in to us. And we would like to hear your comments on that.

And so thank you for being here, thank you for coming, and we look forward to seeing you again sometime in another year. Thank you.

(Applause.)

(Whereupon, at 4:50 p.m., the Forum was adjourned.)

--o0o--

CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Biomass Collaborative Forum; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said forum, nor in any way interested in outcome of said forum.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of March, 2005.