DOCKETED

Docket Number:	15-MISC-04
Project Title:	Fuels and Transportation Merit Review
TN #:	206524
Document Title:	Transcript of the September 18, 2015 Lead Commissioner Technology Merit Review Workshop
Description:	N/A
Filer:	Cody Goldthrite
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	11/6/2015 9:22:42 AM
Docketed Date:	11/6/2015

CALIFORNIA ENERGY COMMISSION

STAFF WORKSHOP

In the Matter of:	)	Docket No. 15-MISC-04
	)	
ARFVTP Technology Merit Review:	)	Lead Commissioner
Biofuel and Biomethane Project Success	)	Technology Merit Review Workshop

CALIFORNIA ENERGY COMMISSION

THE WARREN-ALQUIST STATE ENERGY BUILDING

ART ROSENFELD HEARING ROOM

(HEARING ROOM A)

1516 9TH STREET

SACRAMENTO, CALIFORNIA

FRIDAY, SEPTEMBER 18, 2015

9:00 A.M.

Reported By:
Susan Palmer

APPEARANCES

Commissioners Present

Janea A. Scott, Lead Commissioner

Staff Present

Bill Kinney, Emerging Fuels and Technologies Office
Fuels and Transportation Division

Tim Olson, Energy Commission
Fuels and Transportation Division

Presenters

Harry Simpson, President, Crimson Renewable Energy, L.P.

Susan Kennedy, Special Projects Manager, South San Francisco Scavenger Company

Evan Edgar, Principal, Edgar and Associates - Blue Line Transfer

Tom Koehler, Vice President, Pacific Ethanol, Inc.

Paul Relis, Senior Vice President, CR&R, Inc.

Reviewers/Commenters

Corinne Drennan, Laboratory Relationship Manager for Biomass, Pacific Northwest National Laboratory

Stephen Kaffka, UC Davis Agronomist and California Biomass Collaborative

Sam Wade, Transportation Fuels Branch Chief, California Air Resources Board

Clark Williams, Environmental Program Manager, CalRecycle

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Julia Levin, Bioenergy Association of California

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James Boyd, Boyd Consulting Group

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P R O C E E D I N G S

SEPTEMBER 18, 2015 9:07 A.M.

MR. OLSON: Good morning, everybody. We'd like to start our workshop today. So this is the Transportation Lead Commissioner Workshop Technology Merit Review: Biofuel and Biomethane Project Success. And if you're here for a different workshop, this is the wrong room.

I'd like to go through just a couple of things before we turn it over to the Commissioner here. Just a little bit of housekeeping. If you need to leave, if you have an emergency and you have to leave the room, then you'll need to go out the front doors here off the room to the left, also to the right, and then head over to the park if there's an emergency.

Also, on the second floor you're welcome to go up to the snack bar. There's coffee up there if you need that. And the bathrooms are right out the door to the left.

So we have a -- this looks like this event will -- today's workshop will last most of the morning. We're going to have -- Bill Kinney is going to do -- after Commissioner Scott gives some opening remarks, Bill Kinney is going to give some overview of where we spend our money in the biomethane and biofuel projects in our Alternative and Renewable Fuel and Vehicle Technology Program.

And then we will go through each presentation from four companies. And as we go through each presentation, we have a review panel that will comment on, and add their insights on each project.

And then after going through that, at the end of the morning, we'll open up for public comment.

And I also need to let you know that there's an updated notice for this workshop on the table up front. And the only change from before is that it adds in the E-filing and E-commenting directions on if you wanted to put things into our docket or send a comment letter. That system is -- we're in transition. That's kind of the new direction of this agency. So that when you look in our docket for comments, you can open those items up easily and look at them and comment on them, if you wanted to. Plus you can deposit your own items.

And, with that, Commissioner Janea Scott, would you like to make some comments?

COMMISSIONER SCOTT: Good morning.

Thank you very much, Tim.

I first really want to warmly welcome both our project folks, who will talk to us in more detail about their projects. Thank you so much for being here this morning. And also our reviewers, who have taken time to read through in great detail, information about the project

so that we can have a really great discussion this morning.

What we wanted to do was style this a little bit after the Department of Energy's Annual Merit Review. We don't have the ability to go through literally every project that we fund every year. But we thought that we would start with a few key projects and really have a chance to kind of dig in and look and see what we can learn about those projects, figure out what the successes have been. And if there are things in there that we can take and bring to other projects in this area to identify the challenges and barriers that folks are facing.

And to the extent that they are similar or that we can strategize around how to solve those to continue to move the industry forward, those are things that we're looking to identify as well. In addition really, to any lessons learned from the projects that we can take forth and use to continue to improve how effectively we at the Energy Commission run our program.

So the Energy Commission -- and I won't go into this too much, because I know you'll get a presentation from Bill in just a minute -- has funded several biofuel and biomethane projects. And we're beginning to see progress in many of those areas.

We funded those projects through our Alternative and Renewable Fuel and Vehicle Technology Program, which

gives the Energy Commission up to $100 million to invest in transforming transportation across a broad section of transportation.

And so we really look forward to the continual progress that these fuels have to offer to reduce greenhouse gases and to displace petroleum and also to help us meet our clean air goals across the state.

I want to say thank you very much to Tim Olson and also to our project partners at UC Davis, Paul and his team. Without their vision and diligence, we wouldn't have been able to put together the terrific review that we anticipate having this morning.

For those of you who are in the audience, we have these blue cards. The blue cards are sitting on the table kind of right there at the entrance. If you would like to make a public comment, please fill out one of the blue cards. You can hand it to Tim or come right up here if you want to and hand it directly to me, and that's how we'll know that you would like to make a comment if you're here with us in the room. I just wanted to make sure folks knew about that.

And, with that, let me turn it over to Bill.

MR. OLSON: Let me just also mention -- I forgot to mention my name -- Tim Olson. I'm the point of contact, you'll see on the workshop notice. And, if you have a

question, you have my e-mail and phone number if you have any future questions, I guess.

So Bill Kinney, please?

MR. KINNEY: You might want to be careful because every time I start to speak at these public meetings, the computers go out.

(Laughter.)

COMMISSIONER SCOTT: I don't want that. That's for sure.

MR. KINNEY: There's just a history of that. I think we we dodged a bullet here.

Yes, I'm Bill Kinney. I'm the Technical Lead for Biofuels. And I'm just going to give you a few highlights of where we're at right now.

These are the policy objectives. I think we've seen these the last couple of days, but just a quick review of the policies relating to biofuels and alternative fuels: The Greenhouse Reduction AB 32, the Alternative Fuels Plan, the low carbon fuel standard -- of course, we talked a lot about that yesterday, the federal RFS2, Renewable Fuel Standard Clean Air Act and the ZEV Mandate.

Just a quick review. We've gone through reauthorization and AB 8 has moved us forward to the 2020s. And we're trying to hopefully look towards the future in how we can do things better than we have in the past.

Sustainability has always been part of the AB 118 and AB 8 program -- just a quick reminder that we still look at sustainability as one of our key scoring criteria.

This is just a quick overview, really, of what we've done in funding. And I think this includes the last six of them, 14602?

UNIDENTIFIED SPEAKER: Perhaps.

MR. KINNEY: Yeah.

And so we still have quite a bit of funding in biomethane production. That was more unbalanced in the previous years. More recently, we've had more diesel substitute funding and gasoline substitute funding. So the percent of total are roughly equal -- actually diesel substitutes is a little bit ahead of that.

In terms of the kinds of projects that we've got in the latest round, we're happy with the trend that we're seeing. We actually had some very interesting commercial scale biomethane projects that we funded. And we feel like that's a -- that's a very encouraging trend.

The diesel substitutes' production was also very encouraging. We had very high cost effectiveness, if you want to phrase it that way, in terms of our investment in diesel substitute production facilities. We were getting very high return on our invested dollar.

Just a quick overview. I think maybe we talked

about this yesterday as well. Just the general volume of feedstocks we had. This may not be the latest. I'm sure Steve Kaffka can comment on whether we need to update this table or not. But, overall, we have quite a bit of potential in waste-based feedstocks, as we talked about yesterday. That is a limit on how far we can go in terms of feeding the -- or meeting the state policy goals.

So in terms of our investment goals, strategic investment goals, we've been trying to build capacity of California firms producing second- and third-generation biofuels using advanced technologies and waste-based alternative feedstocks.

We have tried to balance investments among competing needs across different stages of development, fuel types, project scales, and feedstocks. And we have had silos by fuel type, and we're contemplating whether we need to silo by stage as well. We actually have, in a sense, siloed by stage because we've had a separate solicitation just recently, which was noncommercial early-stage development. And so, in a sense, we've created a separate playing field for those kinds of projects.

So problem -- a key problem we face is how do we leverage scarce historical ARFVTP resources. If our historical annual funding were to continue, presents us with some challenges in trying to meet the needs of the

evolving industries and sectors. So we need to figure out how to develop strategies to facilitate increased support for extra Merrill (phonetic) funding for production and GSD displacement policy goals. And we would like to strengthen our recipient project performance. We've had some hiccups in our projects, and so we're always looking for ways to see how we can make that process run more smoothly.

So these are some of the emerging issues as we look to develop and implement our upcoming solicitations. We've been evaluating our projects based on business viability, cost effectiveness at meeting policy goals, project readiness, economic impacts, and environmental sustainability.

This is a very information- and labor-intensive process for both applicants and our evaluation teams. The large number of applications that we get and the labor intensiveness of the process limits our ability to do the kind diligence that we would like to do. We do have technical reviewers. We have a very rigorous process, but we need to make it more rigorous. And we believe maybe, you know, that -- our team, anyway, believes that the quality of the applications is somewhat constrained by this labor- and information-intensive process.

We get applications that really have insufficient resources, that have unrealistic goals trying to meet, you

know, the perimeters of a solicitation. Our scoring teams face an information overload in terms of evaluating a large number of proposals over a four to six-week period. We need deeper and more experienced technical support. We have technical support, but we really need to reexamine how we access that expertise.

And, as we discussed yesterday, you know, the grant funding was approximately 20 million a year, is not adequate for large commercial-scale support, financial support.

And so we're looking at alternative scoring and funding mechanisms to see if we can leverage our scarce resources, our annual allocation, more effectively. And we're hoping to collaborate with stakeholders to create a better, deeper, and broader knowledge of the different sectors' capacities for expansion.

So we'd like to have a clear idea of -- in the next one, two, three, four five years what the sectors can bring online in terms of capacity expansion.

So, in conclusion -- this is just a very quick overview, I'll certainly entertain questions -- our biofuel producers face challenges in responding to market opportunities to meet climate change and petroleum displacement goals. To meet the state and federal policy objectives for transportation fuels, our state's industries

will need increased regulatory certainty -- we touched on that many times yesterday -- especially at the federal level.

And, clearly, funding that goes outside of traditional allocation through AB 8 because either we have to leverage those scarce resources considerably more than we have, or we need an order of magnitude increase in public funding to support the kind of commercial scale that those goals are asking for.

So we have just, you know, the standard contact information, and I'll entertain any questions if you have any.

COMMISSIONER SCOTT: Any burning questions from the table here?

(No audible response.)

COMMISSIONER SCOTT: Okay, great.

Thank you very much, Bill, for your overview presentation.

Tim, do you and I want to kind of tag team the discussion --

MR. OLSON: Yeah.

COMMISSIONER SCOTT: -- or do you want to -- okay.

MR. OLSON: So what I'd like to do is we're going to go through the order of the agenda for the

presentations.

Harry Simpson, Crimson Renewable, is first. We have a tag team of Evan Edgar and Susan Kennedy for the Blue Line project, Tom Koehler for Pacific Ethanol, and then Paul Relis. And maybe as we get into the review comments, I'll introduce -- go through the backgrounds of the reviewers, too.

So, to start off, I'd like to invite Harry Simpson to start his presentation. Harry is the President of Crimson Renewable Energy, which built operates the biodiesel plant in Bakersfield. We think that's the largest producing plant in the state, and the largest capacity, too, at this point.

And so, Harry, could you -- you can do it up here or from there, however you want to do it.

MR. SIMPSON: Do it up there. Thanks, Tim.

We'll get started. I won't bore you with a big long commercial about our company. But real quick, yes, we are now the largest biodiesel producer in the state.

We run mostly used cooking oil, corn oil from ethanol plants, some of it from here in California, some of that corn oil hydrate. Most of our used cooking oil comes from within California. We'll also run animal fats since largely our plant prior to the CEC-funded project was all internally developed technology.

We sell most of our biodiesel to major oil companies who are LCFS-obligated parties, as well as large fuel wholesalers and some truck stop operators. That's pretty typical, I would say, for most biodiesel producers in terms of, you know, customer basis.

Prior to funding our plant was sort of maxed out at just over 10 million gallons a year. The goal, when we submitted the application back in June of 2013, was to expand the plant to 22 million gallons a year.

So the project goals that were outlined was to increase the output of renewable transportation fuels, carbon reduction, increase sustainability, and I believe some economic development. I put a question mark because I couldn't recall, quite frankly, going back a few years ago whether that was one of the stated project objectives.

Essentially, it's about investing California taxpayer' dollars to realize, I think, some of the economic benefits from its carbon reduction policies and get projects in place that will help the state achieve those carbon reductions.

So, aligning that with our project -- well, it was to more than double our production over two years. It was a multiphase project from the outset, essentially two main phases with a couple of smaller intermediate mini projects, if you will, within that. And the goal was to

reduce the carbon intensity of the biodiesel. I would say that was more of a secondary goal. Our carbon intensity, based on the feedstocks we used was already quite low. We felt that if we could do a couple of changes to the plant within the context of the existing corn technology we might be able to run a little bit more of, for instance, distillers' corn oil from ethanol plants, which today is the lowest scoring type of diesel alternative fuel available under LCFS.

In terms of sustainability, we were looking to improve our water utilization and energy efficiency. And, very simply, we just simply look at for each gallon of biodiesel produced how much water are we using and what are the energy inputs in terms of BTUs and kilowatts.

So progress to date. You know, we applied back in June of '13, contracts were signed and right before the year's end in 2013. Our project was already CEQA approved and we got to work pretty quickly. Began the first phase, the construction of that, in April '14; completed that in May. Thus far, I would say we're at about 60 percent. We've completed everything except that second major phase of the project.

That said we're still a little bit behind schedule. We're going to complete in late Q1 next year, maybe mid Q1, if we're a little lucky, instead of the

2013 -- or 2015 Q3 time frame when we originally submitted this.

So, given that we did this back in June, I feel pretty good, and I hope the CEC feels good, that we have executed pretty much on schedule and I think faster than just about most projects they have funded.

So our carbon production rate is actually better than where we thought we'd be at this point. For the last few months, we've been running at a little over 18 million gallons a year annualized. We didn't think we could quite do so well with where we are in terms of the various phases of the project, so that's been a very pleasant surprise.

Our carbon intensity has been ranging from 11 to 16 and a half, depending on what we're buying in any given week or month. It is marginally better than perhaps where it was back in 2013.

We have seen some improvements in water utilization and energy utilization. I would say the energy utilization had to do more with, we put in a new steam system. One of the problems at our plant was we didn't have enough heat to really run at a much higher capacity. You know, steam heats. So we put in a new steam system that's a little bit more efficient. And, in general, I think, for us, it's expanding that production significantly. You know, for most biofuel plants, you kind

of have a baseline energy loading. Whether you're making, you know, in our case, 1 million gallons a year, or 20 million gallons a year, I'm going to have a certain baseline energy cost. So the higher rates that we can run at, the more efficient we'll be in terms of energy utilization per gallon produced.

In terms of budgeting, originally, the budget submitted was a bit over 10-, I think close to $11 million. We ran a little bit over budget. I have yet to see in a project over the course of my career in different industries that has ever come in exactly on budget. But, you know, you could argue, "Hey, not the CEC's problem," right? If the project runs over, you know, it comes out of the matching funds. And I would say in terms of the comment "It's not the CEC's problem," that's yes and no. Because if the project owner/operator doesn't have or didn't budget and doesn't have ability to have a cushion for the matching funds based on the budget that was submitted, the project won't get finished. And to assume that projects are going to come in on budget is naive, to say the least. It's just not the reality in the real world from anything I've ever seen and from people that I talk to across multiple industries. So I think it does become the CEC's problem, because a project that doesn't get finished, is a waste of everyone's time and money.

The other goal we had was to expand employment, so we brought on five new staff in line with where we expected to be as we ramped up production.

So I think, you know, why were we successful? I think that was one of the things Tim asked me to address so that everyone could try to learn from that.

I think one of the big ones is we had the matching funds in terms of -- we actually had the cash. I think some of the projects that have gotten funded, you know, you're trying to get the project grant award and then go out and secure the capital for the matching funds. And that's a little bit of a chicken-and-an-egg issue.

The other thing I'm seeing with some projects is that matching funds -- to demonstrate that you have matching funds, some projects have been able to utilize, for example, the feedstock that they're going to be running for the project to make the renewable fuel. And that, to me, is I think really a mistake. Because feedstock with a capital to purchase feedstock and raw materials, that's a separate issue. I mean, first and foremost, does the money exist to construct the asset and get it done, right? And then once you have the asset built and you need to operate it, then you need the working capital to purchase raw materials, handle payroll; essentially, fund the gap in timing from when you buy raw materials, produce the stuff,

sell it, and get paid. That's what working capital's about.

And to mix the two, when you're talking about having funds available in terms of capital asset construction and allow you to use working capital to say that you've got the money to build the asset, I think is a -- just doesn't make sense, frankly.

So we have money. That was, I think, a big one. And we had expected to probably run over budget. And we had already budgeted -- although it was not required in the grant and it wasn't part of our submission, but, internally, we certainly planned for a 20-percent cushion.

I think the other thing for us was that we have a strong team. I mean, we -- everyone on my team, prior to even joining us, had been in the biodiesel industry in terms of large-scale biodiesel production. You know, big plants. One of my guys was involved in the design and construction of three plants that were between 30 and 60 million gallons a year in capacity for each plant. So we had an experienced team.

We also had the experience of building and operating our own plant, sort of the first go-around, if you will. And some of you may know that the first time we built that plant back in '09, it was a complete disaster. It was internally developed technology. It's a long story.

Happy to share it over a beer if anyone wants. But, you know, we learned a lot from that experience and could apply it in new sort of exactly what not to do and what we needed to do to get it right the second time.

So I think one of the major pitfalls, when projects are being evaluated, is looking at the team. I think some projects get funded by people who have, frankly, never been there, done that. And I don't even mean -- I mean, ideally, you have a project team -- you know, if they want to build a, you know, cellulosic ethanol plant, well, that's kind of cutting-edge. Not too many people have been there and done that, but they've done something very close to that.

But if you have a team that, let's say, in the case of biodiesel, all they've ever done is collect used cooking oil and now they want to go out and build a biodiesel plant, let me tell you, the difference between collecting used cooking oil and cleaning that up so that you can sell it to me versus building and operating your own plant is more than an order of magnitude difference in complexity.

The reality is building large scale, even pilot scale, I think there's a high degree of complexity. But, you know, building renewable fuel production facilities is complex and difficult. And so the experience is critical.

The other is the experience to A, build the asset and B, it doesn't do much good if the asset gets built but the team can't operate it and you can't succeed in the marketplace.

And so having the ability or the experience in the team -- in our case we had already been in the market for multiple years, we were already producing 10 million gallons a year, so we knew kind of what it takes to market large volumes of biodiesel. We didn't have another chicken-and-egg problem that says, "We'll build a plant and the customers will come," and we've kind of got this loosey-goosey marketing plan and off we go. We kind of knew exactly how we were going to market those gallons, who our customers would be. Even though in the case of biodiesel and I think most transportation fuels, those markets don't lend themselves to multiyear, you know, rock solid offtake agreements with pricing, etcetera, all locked down.

And the other thing I think is, is the ability to manage market risk and fluctuation. I know in the case of biodiesel and ethanol these are a commodity -- essentially tied to commodity industries, commodity inputs. We have energy market price risk. We have a renewable credit price risk around RINS and LCFS. And we have price risk on the commodity input side. So it's a volatile business.

And the team needs to ideally demonstrate a plan or a strong prior experience in managing those types of market risks.

For our expansion project we actually -- some of it we designed ourselves. And, in each case, we're kind of managing construction as our own general contractor, if you will. But we did partner with another company for some of the equipment and technology we're putting in. And that partner had a very strong track record building large-scale biodiesel projects. They've done something like 35 over the last 25 years. So having a strong partner certainly helps if you aren't using your own technology. If you're using your own technology, it's that prior experience.

And the one thing I would say -- and this is more common for any of you project developers in the room -- is I can't stress the importance of doing proper engineering up front. You know, trying to do things like, "Oh, you know, we'll just field route that's piping," is typically a recipe for certainly cost overruns, time delays. Just really solid engineering up front will save you a lot of time and money and aggravation down the road.

And I think in the context of, you know, looking at and evaluating project applications, you know, Bill Kinney and his team have a tall order in front of them. But these are all some of the elements I know they already

look at that I think are obviously critical in whether a project's going to be successful.

So I said some of this already that, you know, building these kinds of projects is very complex and difficult. And that once you build the asset and it actually works, hopefully, as designed, you've got to be able to operate it in a volatile market business environment.

I think, you know, in the context of ARFVTP the CEC may evaluate project applications is essentially in the role of an early stage to mid stage venture capitalist, or in the case of our project where we're seeking capital to expand the plant, essentially, a private equity shop. And so I think, obviously, the vetting process is critical.

And I say here perhaps this is -- you know, it starts and ends there. Because if you don't vet and look at all the things I've described earlier you're not likely to have a successful project. And just keep in mind, success is building it, the thing's going to work as claimed and advertised, and be able to operate it as an ongoing business. Because it doesn't really do taxpayers any good, it doesn't do the State of California any good, if it's not what the CEC is looking for, to have assets built and then not run after a year or two.

I think key to that vetting process is, "Show me

the money." You got to have the money. I think the chicken-and-egg thing is -- you know, I get it. I've been an early stage technology guy before and I've raised millions of dollars in Silicon Valley. And I know how hard that is for project developers. And there's a notion here that the CEC can help sort of bridge the gap and provide seed funding or that the grant, in and of itself, is what's going to attract the funding.

But I think the pitfall of that is that it leads you down this rat hole where projects get awarded. It ties up a bucket of millions of dollars, and the project developer can't get the funding for one reason or another. Maybe because the private capital markets have said, "These guys don't know what they're doing," or they don't like the market risk -- a variety of reasons. And then that money is essentially tied up and wasted, right? Because it could have gone to another project that would have gotten executed, because it had the capital already.

We weren't asked to "show the money" so to speak. You know, our match was pretty much cash from our balance sheet. We have a strong parent company, so we have an internal borrowing facility that we actually leveraged for this project. And we were counting on that for the 20-percent cost overrun that I had budgeted for.

And the way the program works too, you have to

kind keep in mind, is that you don't get the money up front, right? You've got to have the capital to pay your invoices, buy your equipment, and go through a reimbursement process. And that process takes, if everything goes well and your documentation is really good -- I mean, your best case is six weeks from when you submit. But, in reality, from when you get the invoices to when you submit and get all your ducks in a row that takes about three or four weeks.

I mean, I'm not complaining. I understand the need for the strong recordkeeping and you need the audit trails and track all the hours of internally allocated resources etcetera, but that's just the reality of it, right? So you need to be prepared for that. And if things kind of get dragged out at CEC it might be ten weeks from submittal until when you get paid. So you got to float, essentially, that difference, which means you got to have the money up front.

What else is there that I hadn't already touched on?

Construction risk. You know, I think a lot of projects depend on an external technology provider, you know, construction manager. It's important to really vet that. Larger projects tend to -- you know, the right type of technology or EPC partner you can get a performance

bond. We obtained that from the partner we selected. And what that performance bond means is that, if they don't deliver or the equipment and the design doesn't perform in accordance with the contract specs, you can collect on that bond. And it's a little bit of insurance.

And, essentially it puts the other guy in a position of having some skin in the game, right? And if they don't have a big enough balance sheet to provide that performance bond and they don't have the prior experience, that also tells you something about their ability to execute. They don't have -- in order to get these bonds, typically that company will need a track record of execution.

I think one of the things for the CEC to consider is, you know, Bill talked about some of the staff constraints and, you know, the reality is, is that the CEC isn't staffed with a bunch of people who come out of the renewable fuels industry or even come out of, you know, regular, say, oil and gas, or other types of related industries necessarily.

And we've talked about kind of all the moving parts both to looking at the technology. Is the technology valid? Can it deliver? Can the team execute? Do they have the experience? Can the team run the thing successfully and not go out of business once this thing

gets built?

And so perhaps finding a way to incorporate peer review would be of benefit to the CEC. I think it's one thing to have -- you know, take the process design that we submitted, which when we submit it, when most companies submit it, it's not super detailed. Partly it's because everything you submit is in the public domain and so companies are certainly reticent to give away their secret sauce. So you're going to submit a relatively simple block flow diagram, a simplified process flow diagram. And CEC will take that and maybe send it to someone like NREL and say, "Does this pass the smell test?"

Well, that's kind of a 30-foot-thousand view. And you have a lot of, I think, technologies and process designs that look like they ought to work, but it's a huge leap from that to something that actually will work. Even in our case, we weren't using some never before done, you know, new mousetrap. We're using, essentially, established, proven production process technology methods in the case of biodiesel, but there's still a lot of ways to get it wrong. And so being able to do a deeper dive on the technology is one thing.

The other is looking at the people on the team. It's a surprisingly small world out there. And if a little more digging and getting the kind of industry peer review

and asking around a bit more, I think can really help vet the team.

You know, assessing the business plan and long-term market and business viability. I mean, I could look at an application and simply say, did they at least do a, you know, two-dimensional Excel table function to run some, what we call "scenario analysis" or "sensitivity analysis" and say, how do the projected cash flows and earnings change as a function of changes in raw material inputs and sales price, outputs?

And, in reality, in the context of a gasoline or diesel substitute the revenue side is a three-dimensional beast. You've got the price of the fuel tied to either petroleum-based gasoline or diesel, you've got federal RINS, and you got all CFS credits.

So to be able to be really -- you know, as the team model it there are some things that only people who have been in the industry or very similar industries, I think, would have a deep enough understanding to answer some of that.

You need to be sure that the project survives long term. I've talked a bit about that.

I think one of the things -- some of you were at the meeting yesterday at UC Davis. Tim asked the question, you know, "How do you kind of foster the growth of the

biofuels industry in California and get more commercial-scaled projects going when you can't do long-term offtakes?"

I mean, the forward market, in general, just for petroleum-based fuels gets pretty skinny after one year. I mean, if I wanted to go out and do a five-year swap on petroleum diesel fuel it's going to be an over-the-counter trade. That has certain regulatory requirements now, post Dodd-Frank. You will need to have a balance sheet that will support that trade, because I can guarantee you Morgan Stanley or Goldman Sachs aren't going to do that trade with me if I'm a startup company with no money in the bank.

So that's a little bit of a tricky thing. So if you can't have rock solid long-term offtakes that cover it, those three elements of pricing -- the petroleum base price risk, the RIN price risk, and the LCFS price risk -- then, by definition it means the team better be prepared to deal with market volatility in those three elements.

You know, I know the CEC has heard a lot about metrics in the context of how to allocate dollars within the ARFVTP -- or TVP. I think that's part of it and using those same metrics to help evaluate projects based on projects that have been successful and say, "What are the metrics for those projects?"

Well, there's the obvious metrics around production, etcetera. It's those are quantifiable metrics and certainly useful in looking at, you know, carbon reduction etcetera, to allocate dollars when you think of this pool of money as building a portfolio of assets that ideally achieves the desired result, but also trying to come up with metrics in evaluating specific projects.

I'm not going to restate all this. This is just kind of your standard summary slide. That is the last one. I'm going to go to the very last couple of bullets.

You know, I've tried to look at this from the prospective of a taxpayer. And from the perspective of saying, as a whole, California's got these policy objectives: petroleum reduction, carbon reduction. And I think now a growing impetus, certainly within the legislature, to see the benefits, the economic benefits, of these carbon reduction policies.

California could have LCFS and have every drop of fuel come from outside of California. In that scenario, California realizes zero economic benefit. There's billions of dollars of potential economic benefit that can stay here in California tied to these policies. So how do you achieve the policy goals? Is the current ARFVTP the best way to do that?

I talked a little bit about this yesterday. I

think for those of you that weren't there, there is definitely a gap in the marketplace that -- when I think of the CEC I tend to think this isn't so much about ARFVTP, but the State as a whole needs to do a better job of kind of coming together and saying this is what we want to achieve. This is the pool of money.

And you've got these sorts of silos, these islands. You know, CEC with their pot of money, CARB. In a perfect world that would be better coordinated. But there's no doubt that regardless of whether it's ARFVTP or some other pile of money, there is a gap that the private sector isn't prepared to take on very well.

Early stage venture capitalists, yes if you have a very disruptive technology they do certainly make some investments, but that's cyclical and that kind of goes with what's in fashion.

You know, back in '06, '07, a lot of venture capital dollars piled into what's called "clean tech" -- all different types of renewable energy technologies. And that spigot sort of turned off after the bubble burst in -- the Lehman bubble burst in '09. And it hasn't really bounced back in a significant way.

And so there's a gap in, I would say, R&D and kind of taking a project from R&D to pilot that the State perhaps can play a strong role in that for those types of

projects. And in that case inevitably they're picking and choosing technologies or trying to build a portfolio of technologies with a clear understanding that hey most of this stuff -- as an early stage venture capitalist I have a lot of friends who kind of live and work in that world. You know, they're hoping for out of ten projects one single and one home run and eight complete failures.

And so it's the same, I think, mindset that the CEC -- in the context of this program with the State of California when looking at programs as a whole -- needs to take on and take this portfolio approach with that understanding.

I think for commercial scale projects -- and if you're -- if the goal now is to get a lot more commercial production that implies currently available technologies, proven technologies. I'm not sure, you know, even though we benefitted from this particular program and it worked in our case, on a broader basis, to get really significantly more scale going quicker I'm not sure this is the best way to do it.

I think a lot of folks might argue that the private market would do a better job in sort of allocating capital if they see their way to policy stability -- you know, long-term understanding where LCFS is and ideally where RFS is on the federal side. But also understanding,

if you have regulatory policy, do the numbers play out? You need five to seven years to get the payback. And that's where perhaps if the State thinks of return on investment, putting dollars to work that is on a performance based incentive would achieve the state's goals more efficiently and faster.

So performance based incentives like tied to actual production of fuel and carbon reduction and, perhaps, you know, where that fuel gets produced in terms of trying to stimulate economic activity in disadvantaged areas. Those kinds of things, ultimately means the State's only paying for what it gets. It doesn't have to tie up capital in projects that never get built for one reason or another and spend a lot of time trying to vet individual projects.

So food for thought. Thank you for your time.

MR. OLSON: So Commissioner Scott, what I'd like to do is introduce the reviewers. And then turn it back over to you provide any guidance on the questions for them.

And the reviewers are sitting on the other side of the room there. I would like to introduce each one of them and then we'll go into their comments.

So Corinne Drennan is from -- she's a Laboratory Relationship Manager working with U.S. DOE Bioenergy Office. She works for the Pacific Northwest National

Laboratory and her expertise is in chemical and biological process development related to conversion of biomass and waste systems to liquid fuels.

Sitting next to her is Steve Kaffka who is the Director of the California Biomass Collaborative and Co-Director of the Center for Renewable Energy Technologies at UC Davis. And his background, he's an agronomist. He's got the significant background. If you heard him yesterday, he had some pretty good information about the feedstocks, both purpose grown crops and waste grain.

And sitting next to him is Sam Wade who is the Branch Chief of the Transportation Fuels Branch of the California Air Resources Board. He's been involved with the implementation of AB 32 Scoping Plan and currently the Manager Oversight of the Low Carbon Fuel Standard.

And sitting next to him is Mr. Clark Williams who is an Environmental Manager with the Products Stewardship and Innovative Technology Section of CalRecycle. And he's been heavily involved in AB 32 Scoping Plan and then implementation of a pretty significant law in California that 75 percent recycling diversion goal, all the waste from landfills.

So, Commissioner Scott, would you like to then provide the guidance on the comments?

COMMISSIONER SCOTT: Sure.

So I think we're actually really looking for the same kind of set of questions that we asked each of our presenters to present on. So as you went through and had a chance to review the projects in some detail, what are the things that you saw as part of those projects that were successes that we ought to know about and keep an eye on and carry forward?

What were the things that you saw as you reviewed those projects that were barriers that we ought to continue to think about how to solve and overcome?

And then similarly on the lessons learned are there tidbits or pieces of information, helpful information that are things that we can carry forward and be sharing with other project developers as we go forward to continue to make these projects successful?

And I think Harry touched on it quite a bit, because we're not just trying to fund projects. We're trying to fund projects that get built and deliver what they said and get the fuels into the California market, right? So that the goal is not just to get money out the door; the goal is to get money out the door that really have a great potential for being successful.

So that's what I would like to talk to you about. I want to do just a quick time check, because we're a little bit behind. We have about, I think, 40 minutes for

each of the projects to have a good discussion. So I think we should talk about this, but I don't want to cut off any of your thoughts here. And then what we'll try to do is maybe have the presentations be about 20, 25 of those minutes, so that we have 15, 20 minutes to hear from each of the reviewers on each of those, if that works for you all.

But let me turn to the reviewers and get your thoughts on the Crimson Renewable Project. And we can either go down the row, or if you just want to jump in -- it's up to you all.

MR. KAFFKA: You're the judge.

COMMISSIONER SCOTT: Okay. Why don't we run down the row? Should we start with Corinne?

MS. DRENNAN: Thank you so much for sharing all of the experience that you have in developing and managing projects. That was -- it's really fascinating and I think very helpful, as Commissioner Scott mentioned.

I have a couple of questions; and they're a little bit long and technical, so I'm sorry.

So the numbers that were in the review package for the water intensity of the Crimson Plant seem awfully low to me compared to -- say let's take ethanol as an example or petroleum fuels. So I was wondering how the water intensity compares to similar technologies and how

you are setting your targets.

MR. SIMPSON: I mean, to be honest, we're not -- I'm not very familiar with how much water is used in other types of renewable fuel technology. In the case of biodiesel I mean, there are some biodiesel across this technology options that use virtually no water other than the water that's necessary for cooling tower water and cooling blowdown.

In our case we have that, plus we use water to, essentially wash the biodiesel. So what we looked at was really reducing the amount of water that we are going to use to wash the biodiesel with this new system compared to what we do currently. That's kind of the final phase of the project we're putting in.

The gains that we've seen in water utilization, so far have to do with a more efficient steam system. So that we are getting more gallons out for the steam plant that we have and by virtue of that, you know, we're using less blowdown water than we would have in the past.

MS. DRENNAN: Excellent. Okay.

So the performance bond, I'm very curious about how that works. So there's a parent company that you could pull from, but what were the technical performance barriers that you faced and how did you overcome those?

MR. SIMPSON: So a performance bond is actually

not provided by us or our parent company, it's provided -- so part of our project we designed, built, constructed all by ourselves. There's another part of our project, it's the final phase, where the equipment and the engineering was done as a package by another company --

MS. DRENNAN: Okay.

MR. SIMPSON: -- out of Europe. And we will manage the construction with their involvement.

And so you clearly lay out -- and there's a lot of negotiation that goes back and forth as to what this thing is supposed to deliver.

And, of course, for the technology and equipment provider they're very much, "Well, we'll deliver this if you put exactly this into the system." So you have to negotiate the input, output specs.

And then once that's worked out, what the performance bonds means is, so they provide essentially -- there's a couple of different ways to do it. Sometimes on very big projects there's essentially reinsurance firms that do it. But in our case we used a letter of credit. So they posted a letter of credit that allows us to draw on it. So it ties up for them -- in our case you'll never find a provider who is really going to guarantee you a performance bond that includes opportunity costs and lost profits and that sort of thing. They are typically only

guaranteeing the cost of the contract.

MS. DRENNAN: Yeah.

MR. SIMPSON: Right? And the performance bond says if it doesn't work and they don't fix it and get it to work within a certain time, we get to collect that money.

MS. DRENNAN: Interesting.

Okay. So I only had one more question for you. Given all the wealth of experience that you have both in design and project management and getting things going, what would your appetite be for newer technologies?

MR. SIMPSON: Not high.

(Laughter.)

MR. SIMPSON: I am not interested. You know, we're looking at some of the projects now. We're not really interested in being the first commercial scale plant for any given technology. I'm a little less disinterested to be the second. But I would prefer, much prefer, to see -- as a matter of fact not prefer, I insist on seeing commercial scale operating data going back at least a year or two for a couple of projects before we're going to --

MS. DRENNAN: Interesting.

MR. SIMPSON: -- go out and spend money.

MS. DRENNAN: Thank you.

COMMISSIONER SCOTT: Great.

Steve?

MR. KAFFKA: Very nice and thoughtful presentation, Harry.

It seems like the project is on time in its objectives and it's going to achieve the scale that you talked about based on the materials that you've said in your presentation. So I'm not so concerned about that.

One of the interesting things about current biodiesel themed systems is they're using residual resources from mostly -- there's competition for such resources, increasing diverse uses for such resources, and so on. Also your proposal and your comments to look to the use of residual corn oil, and corn -- grain ethanol based systems, which is increasingly available. But also, again, may have alternative uses as an animal feed and so on.

So my question is, is what do you foresee as your -- obviously, you think you can secure your feedstocks at prices reasonable enough to provide fuel in a competitive manner. Can you talk a little bit about that? I mean, you talked about forward -- I mean, it seems like you've invested this money under the assumption that you can do that.

MR. SIMPSON: This was one of the hardest things for us as a company getting involved in this business, you know, in a plant tied to those types of raw materials, because we had to go into it knowing that there was no way

short of owning your own ethanol plant or buying a company that is collecting all that used cooking oil or animal fat and getting them to render -- it's called "rendering" or "renderers" -- and getting in that business. We couldn't control it just in terms of pricing and availability. And the market for those commodities are very much next month kind of markets. Corn oil, a little bit better, you can go out three -- we've looked at some six-month structures, but not much more beyond that. So you have that.

You know, earlier I talked about managing price risk. I mean, at the end of the day you're competing against those other uses. And pricing is going to determine who gets what. And so will your business allow you to pay up and -- but, I mean, everyone else is in the same boat, right? No one else -- I mean, there's a handful of folks that might truly control their own raw material in the biodiesel industry, but the vast majority don't.

Yeah, the integrated agri-business concerns like ADM and Cargill, you know, Louie Dreyfus, they own the soybeans. They buy them from the farmer, they crush it, so they've got the oil. In fact, the problem is they have too much oil. They're trying to prop up the price and biofuels has been a great outlet for them.

So there's -- I mean, in a perfect world, you know, I'd love to see on a very large scale -- and Steve

you and I talked about this back in '07, '08 -- in looking at purpose-grown crops here in California. And there was an opportunity then and there's still a big opportunity now.

Particularly given the drought, because some of these alternatives like Hannalina (phonetic) or even just regular canola are much more water efficient and some of it could be dry planted on the west slope. And I would love to do a deal with a group of farmers where they could commit 150,000 acres to me and go out and plant that crop.

But the flip side to that, in all honesty, is I would need them to be able to backstop that commitment. And/or you would need crop insurance, because if the crop isn't there where am I going to go get my feedstock? I've relied on these guys, and now I got to go out in the open market. And who is going to pay the difference and all that?

But, yeah feedstock security, in the long run, is difficult for most folks in the biodiesel industry.

MR. KAFFKA: Thank you.

We need to talk some more about the feedstock crops. I've done a lot of work on that recently.

MR. SIMPSON: I look forward to it.

MR. KAFFKA: The second point is more of a profound one, philosophical one, really, about how the

State should invest its resources. As you know, I'm an Advisory Committee member for the AB 118 Program as well.

And so, if I understand your argument you're really making a conservative argument about the State restricting its investments in more certain kinds of pathways. And there's been this discussion within the AB 118 program, how much risk to take, how much to be a technology stimulator?

And there are a certain amount of risks that are simply unavoidable if you are more out on one end in terms of new technology in business than if you are investing in traditional technologies backed up by companies with, as you say, robust balance sheets, which means basically current players.

So it's an important question to be resolved. Perhaps there should be a more explicitly venture capital type fund that the Energy Commission sets up for those kinds of riskier investments. It's a little bit more flexibility in how those funds are actually spent and so on compared to a separate set, which group -- based on metrics for performance which provide more security to the Commission.

But it seems to me that you need to think about AB 118, is this -- so far, it's been the government's willingness to invest in kind of uncertain things. So I'd

like your comment on that.

MR. SIMPSON: I mean, I said earlier -- I agree with you that there is this gap in the private capital market where it's very difficult to get funding for R&D and, you know, things that are at the pilot stage, to get them going. And there's a role, I think, that could be played by the State.

I think there's ways to do it though that perhaps -- now I talked about having the matching funds. And you shouldn't count working capital type stuff as part of matching funds. I mean, it could be you have a term sheet from a venture capital firm that will co-invest with the state contingent upon being awarded the grant. So I think there's ways that maybe -- I would agree a separate venture capital fund with very specific -- with a notion that it's going to spread its bets across a portfolio of technologies. And the State being fully prepared that, you know, more than half of them will fail and you're looking for a couple of home runs. And I think that does make sense.

I think in the context of the AB 118 monies it was a pool of money that tries to get allocated out to achieve kind of a higher level of goals. Namely, get renewable fuels into the marketplace at the lowest possible carbon intensity. I would say that sums it up.

And there's been in the investment community there's all sorts of discussions of how much should go into electric and hydrogen and biofuels, etcetera. And we've made arguments, people have made arguments, "Well, you know, if you look at the metrics it always comes from this." And I get the need to spread the dollars to sort of foster new and up-and-coming things.

But I think that's part of the problem with AB 118 monies is that it's too broadly defined to be implemented effectively. Because the team that is going to look at -- and how you would craft the criteria in looking at very early stage more R&D or pilot scaled-type projects is very different than how you look at and the type of expertise involved in looking at a more mature plant expansion project like mine for example. Or a new biodiesel plant that is using more or less current or next-gen technologies that have had a couple built already.

And so that's where I say I think using performance based incentive to really -- with an eye towards that's how you focus on investing dollars to foster more commercialization. Mature -- the actual deployment and rollout of more mature proven technologies would make better sense than trying to pay projects to award for construction spending.

And I think the other thing is where role has not

been -- in yesterday's meeting that many of you were at there was a discussion with market access. So in the context of ethanol guys' market access is E15 blending and some other things. In the context of maybe DME and somewhat true for biodiesel, it's fueling infrastructure, but more at the super wholesale level, at the rack right at the end of the pipeline where all the fuel is basically sold and put into those big semi-trucks to go to fueling stations or to fleets or gas stations, etcetera.

And I made the comment yesterday, I'll make it again, I mean, that's where the state could have spent money with an eye towards stimulating the build out of those infrastructure investments in a way that would have made the ongoing cost, which is really a big issue in terms of market access, more manageable.

So, in the absence of that, Kinder Morgan goes out and says, "Hey, we're spending $4 million a terminal, we don't do anything if we don't get a 16 percent ROR and we have a two-year pay back.

Well, Kinder Morgan is charging 18 cents a gallon, okay, to blend biodiesel here in California at every Kinder Morgan terminal that has -- there's three of them that have that investment. And 18 cents a gallon is a crap ton of money for a biofuel producer. Because guess who pays for that? Me. Me and every other producer pays

for that. Because the customer, be it Chevron, a truck stop, or a fuel distributor, is not going to pay it, right?

So if -- this would have been a great opportunity for AB 118 monies to go to Kinder Morgan and say, "Kinder Morgan, we will pay for $2 million of it and you pay $2 million, but your return on capital of $2 million is capped. It's defined, it's a cost-plus model," and that blending fee would be down to about 2 cents a gallon.

COMMISSIONER SCOTT: Let's make sure we have time to hear from both Sam and Clark and then we'll go to the next presentation.

MR. WADE: And thanks a lot, Harry, for your presentation. Very interesting.

I'm wanted to focus on sort of CI performance. It sounds like at the outset of the project there was consideration of further CI improvements through all the feedstocks and some of that didn't materialize. Can you talk a little bit more about why that happened and how that would relate to your goal of having more of a performance based program?

MR. SIMPSON: Well, part of that -- I meant, it hasn't -- I should said it hasn't fully materialized yet. I mean, the goal for us was to enable us to use more corn oil than we could in the past.

And there's a rationale to do that based on LCFS

pricing, because corn oil from dry mill, dried as -- still as green plants, has a forced CI that's the lowest available out there. The next best thing is about a 12 from used cooking oil used in California if it's not cooked.

And so we would like to use more corn oil, but most of the year -- and so there's two reasons. One is that we haven't finished the work that in the last part of the project is what we needed to run more corn oil. Some of what we have done has certainly helped.

But the price of LCFS credits wasn't high enough most of the year to push us towards corn oil, because corn oil is always more expensive than used cooking oil. So LCFS credits need to be at a certain point where it more than offsets that cost difference, right? So if LCFS credits had been at 65 the first half of the year we would have used more corn oil and our CI would have been lower.

MR. WADE: Okay. What about -- I believe the application contained a discussion of brown grease and olive oil, soy oil, things like that. Did you guys go far down -- as far as those feedstocks and what stopped you from going all the way?

MR. SIMPSON: Well a, there's no (indiscernible) oil out there in any commercial scales. You know, brown grease is something we've looked at. What we -- I think

everything that we're doing will ultimately be part of solving that particular -- cracking that nut. But there's some things that we -- there's additional systems we would need to put in to run brown grease. And you can think of it as, you know, what we've done was sort of a down payment on that.

MR. WADE: Okay. Can I ask you about the peer review concept that you put forward? As you sort of said, it's a small world, right? So how would you balance the need to maintain confidentiality with having a robust discussion with the industry or the other folks in the industry and say, "Are these guys for real," right? It seems like there's a tension there.

MR. SIMPSON: Yeah. You know, I think that certainly there's no issues -- I wouldn't think there would be issues around confidentiality just in terms of looking at the team. And for the most part everything -- my understanding was, when we submitted our application it was with the understanding that everything we submitted was in the public domain, so financial models, etcetera.

And so all that, you should have a confidentiality from handing it over a peer review group to look that over, look over who the individuals are, look over who the technology partner is, and look over the financials, and see what they've done. If nothing else

what you'll hear is, "Hey, there's not enough information here on the financials. There's no sensitivity analysis."

So I don't think that -- and, I mean, as far as the technology review goes same thing. Most people aren't submitting full-blown P&IDs and, you know, in full drawing package. Because everything they give you -- and I think that's part of the problem frankly, is you need to able to get more information without A, making -- with the understanding that it won't be publicly available.

But then yes it gets tricky to how to you put it with technology and let someone else who is in the space review it?

MR. WADE: Great. And I heard that tension in what you offer. So I think that's an important question to try and resolve when you go to a higher level of detail.

Okay. So the last thing I would ask, I guess, is you mentioned policy certainty and certainly the LCFS is attempting to provide more certainty, you know, through the re-adoption of the program that is occurring next week hopefully. I knock on wood.

And, you know, the long-term planning that's going to happen in the AB 32 scoping plan process will, you know, help us determine what the target should be post 2020.

How early do you feel like it's helpful to have

those established, right? I mean, it sounds like, you know, the overall timing around the return on some of these projects actually needs to be pretty short in many cases. So when do you need that -- the policy certainty of new targets in the LCFS?

MR. SIMPSON: As soon as possible.

(Laughter.)

MR. SIMPSON: It's not even clear right now. And I've ask the R&D staff whether they are willing to say that -- you know, privately, they may say, "Well, we'd like to bump the targets up." And there'll be a whole long drawn-out process to try to make that happen, and I get that.

But, you know, there's not even an understanding that LCFS will remain at the 10 -- so assuming they pass the 10-percent reduction in 2020, is it locked in statute that that's going to be the case for -- that it will be no worse than a 10 percent reduction for '20 to '30?

MR. WADE: Right. So the current reg actually does continue post 2020 at the 10 percent level. And we believe we have the authority to go past the end of that period. And so I think those discussions will kick off shortly here, and the first Scoping Plan Workshop is actually on October 1st. So we're getting ready to begin that conversation.

MR. SIMPSON: Yeah, I think the quicker that can happen, the better.

COMMISSIONER SCOTT: Let's go to Clark.

MR. WILLIAMS: Thanks, Harry. I really enjoyed the presentation.

Primarily, like Corinne said, we're primarily interested in using waste-based feedstocks, (indiscernible) the landfilled. But I did want to follow up a little bit on your concept of performance payments.

And if we're talking about performance payments in reflecting kind of (indiscernible) commercial production to produce quantities of fuel, have you given thoughts to what might be a meaningful way to set those and adjust those over time?

And also what length of time you need those performance payments in place (indiscernible) filed?

MR. SIMPSON: Well, there's a group that has been formed kind of encompassing folks involved in alternative gasoline fuels, alternative diesel fuels, using biogas for transportation that has looked at this already. Loosely, it's called the "Biofuels Initiative." And in time the performance payment to gallons produced, the carbon score of those gallons, and where the gallons are produced.

In terms of a duration that those incentives need to be in place I think to really stimulate new capital

investment, you would want at least five years. Seven would be a little bit better. Ten would be awesome. But you need at least five.

You know, someone said yesterday, "Hey, let's just start something and throw it out there for six months." I mean, it would be great. There's a part of me that says yes to that and there's a part of me that says, "What's the real point of that?" But I think you need five-plus years.

MR. WILLIAMS: Thank you.

COMMISSIONER SCOTT: Great. Thank you so very much.

So I would like to go now to Susan Kennedy and Evan Edgar. And I'll let Tim give you a line or two of introduction.

I want to remind folks, if you'd like to make a comment, please be sure to fill out the blue cards, which are on the table back there, and give them to Tim.

Susan and Evan, I'm going to ask you all if you can make sure your presentations finish by about 10:45 or so, and then we'll give our panel till about 11:00, and then we'll kind of keep going that way to make sure we have a chance to really hear from all of us.

And remind folks that there is an opportunity to submit additional thoughts and comments to us into our

docket. We do read all of those documents, and so this won't be the only opportunity that you have to let us know what you're thinking.

MR. OLSON: So, Evan and Susan, if you could come up here that's probably the best way for you to do the presentation.

And I understand you're going to do a tag team. But Evan is part of the development team of Edgar and Associates for the Blue Line Project that the Energy Commission co-funded, and also City of Napa Project that is kind of in midstream.

And Susan is the Project Manager for the Scavenger Company -- I'm sorry, I got the wrong name -- for the South San Francisco Scavenger Company and a long history in the city, South San Francisco city government, including most recently Assistant to the City Manager.

So, Evan.

MR. EDGAR: And we are scavengers. We've been scavengers for a hundred years and that's why we're successful today. It's a local garbage man story.

We've been in the community throughout California for 50 to 100 years. And as part of that, we have built quite the system. Back in the '70s, when we created the Waste Board and they created the franchise system. And the franchise system is very important in order to have public

health and safety, environmental controls. So back in the '70s we had this great franchise system that allowed 10-to-20 year contracts.

And then in the '80s and '90s came AB 939 recycling. And as far as recycling, we started building a recycling facility called MRFS. And we started getting financing through the California Public Control Financing Authority that allowed us, in order to start building facilities, with a balance sheet. Being multi-generational in the community we don't own the landfill, although we own the trust at local government in partnership to do things within the community.

And then about last year, or in the last decade, the truck-bus -- my brother, Sean Edgar, worked on it -- whereby we had to get off diesel. And CARB came and said get off diesel -- heavy duty. So we did. We both CNG trucks and we went through a couple of generations and took that risk.

And once again we went back to the well of California Pollution Control Financing to get some more money, and they supplied it. So we were happy to be Heavy Duty Class 7 and Class 8, about 15,000 trucks in California that want to go from diesel to CNG and then to RNG as a (indiscernible) fuel from CNG.

So then in this decade we have organics,

greenhouse gas reduction. So we're going to the well for the third time to build facilities to co-locate. So within the community we've been there, done it, and we have the trust in order to keep on with the partnership. And we work with the Climate Action Plan.

Susan Kennedy will talk more about how we got involved with the Climate Action Plan with regards to CUP, Conditional Use Permit on land use where yesterday a lot of things came up about "we don't have feedstock control." We do. CEQA is your enemy. Well, CEQA is my friend, because we tie it to the Climate Action Plan. We're able to get permitted. We don't go macro; we go local. We're not too big to (indiscernible) We're local in the community.

So that's our story, and we have a strong project team because we took innovative risks on recycling, on CNG, and now we're doing anaerobic digestion and composting.

We saw this yesterday. And policies all do work together. I think they're integrated quite well. And at the state level they go down to the local level with Climate Action Plans. And these Climate Action Plans roll out in the community and we're involved with it.

But with anaerobic digestion what we're doing, we hit all five pillars. We're supported by five pillars in composting and anaerobic digestion, every part of it, because we want to have RNG. We can get our CNG trucks

with an RNG offtake agreement in order to get some of that Cap and Trade money, which carbon failed to produce this year.

Then we're part of RPS. We use the biomethane to run the facility and the boilers. Our facilities are LEED certified. Susan will talk about that.

We're getting organics out of the landfill (indiscernible), zero organics by 2025. And that's the Healthy Soils Initiatives. We've taken that digestate, the compost from anaerobic digestion and we're making compost, running clean compost. We put it back in the soils of California. So we sequester that carbon.

So we're all five pillars and we integrate those policies.

Yesterday, as part of our application, we did do a CI. We had something different. I think -- Rick Morrow couldn't be here today, my principal engineer. He came up with a minus 40 or 50 as a part of our grant application for Napa. And, right now, the default's minus 31.

I got this from a staff report from February 19th from CARB, and I kind of equalized it. But by default minus 31 is a good place to be. Right now, we're submitting our six-month final report to Hugh ((phonetic) with regards to where we're at with the data. We've been operational since January, so we have six months' worth of

data. And the CI's actually come in a lot lower. So we have to work with CARB staff on that model, because some of that modeling there has some numbers in there that puts us at very extremely low carbon. So those numbers are coming to you soon.

We are -- when I first picked up the project, I didn't know what to call it. We're your community-scaled distributed renewable transportation reductions facility. That's a nice way of saying distributed generation such as for electricity. This model is local. It's the same thing, but for transportation fuels for RNG.

When I drew up the grant proposals it was a kind of new concept. How can we go from this macroeconomics of oil pricing and crops? Well, we don't have to do that. We're local. And we don't have to be tied to a lot of different nationality when we keep everything within that sweet spot, at the community level, where we actually, with regards to the investment funds from the Greenhouse Gas Funds we do all five -- or all four.

We do the clean transportation, the clean energy, energy efficiency, we get waste out of landfill, and we put the carbon back into the natural resources, back into the soils of California. So we're right there.

And one thing that keeps on popping up is metrics. With AB 32 people want to know how much it really

was a benefit. What's the bang for the buck?

There's no studies on it. I had to go back to a Stanford study in '08 put out by Professor James Sweeney. And he did a Co2 supply curve and a marginal abatement cost study. So back in '08, we didn't have the metrics for covered compost and anaerobic digestion, but now we do. We've got some information.

So my team put together a cost curve and the marginal abatement cost is minus 50. We're up there with energy efficiency. Compost and AD is great. And I have letters to Larry Nichols. I've got a letter to CalRecyle. I've got letters to Matt Taylor. What's going on with cost effectiveness of AB 32, an investment plan that is being -- for the next three years? I believe that AD is right there as one of the biggest bangs for the buck.

So how do you roll this out? How do you replicate this? Okay. This is important, because we're not going big. We're not going up with regards to having more gallons at the location. We're going across California with all the different cities and all the communities.

The City of L.A. just put out a great franchise agreement for their commercial waste. How do you go get to the commercial waste? And one of the things is they -- in this blueprint that came out in July 2015, it's about

guaranteed contracts for exclusive franchise. Right in this report you need to have an exclusive franchise to have the tenants build the facilities. It's a great win. Zero waste by 2025. We can do it.

Source separation. You need clean organics to make clean compost to put back into the soils for organic soil. So don't mix it all up with other garbage. So we have a Healthy Soils Initiative.

You have to have labor, a prevailing wage. When we did the CEC grant, the prevailing wage was important as was a safe work place.

And, of course, environmental quality. With the new engines coming out on NOx for the CNG trucks would be great, we have big bang for the buck, and we're reducing VMTs. By keeping things local, we're not importing diesel and exporting trash. We do neither now. We keep our fuel local; we keep our organic waste local. And we cut back on long-hauling trash to a dump -- or I mean the landfill.

With regards to AB 1826, we've got Dick Matheson and Patty Loke (phonetic) do a lot of good work with regards to working with a Caley Day (phonetic) and the Legislature on diverting organics out of the landfill. This is a phase-in collection approach that would guarantee our tons. By 2020 we're going to give out 8.1 million tons of commercial organics at a landfill, which is about

4.4 million metric tons of Co2 reduction. It's about 100 facilities, about 1.5 billion. That's doable.

Our industry is ready to do that by taking our 15,000 trucks that's on CNG but then has the RNG offtake agreement tied to it, you get the incremental cost by CARB in order to help fund that transition totally off diesel to CNG to have a differential.

Okay. CARB has another plan out for SB 605, a concept paper, Zero Organics by 2025. That would be a total of 14.8 million tons of commercial organics and residential and about 8 million tons of Co2 reduction. It's a great plan, and we're ready to do that.

In the project we have Kevin Miller. He's a Project Manager for the City of Napa. We've had a lot of good lessons learned with South San Francisco. You know, the 11,200 tons per year, we ramped it up to 25,000 tons per year, which is a sweet spot. We went from a fabricated metal at South San Francisco -- it was the first one built in America -- (indiscernible) boxes in order to go prefab concrete at Napa. But the cost per ton get's more on scale from 11,200 and we thank California Energy Commission for that $2.6 million grant at South City.

And, like Harry, we had a cost overrun. We predicted the cost of the project would be 7.2 million. It went up to closer to 10 million. We had a lot of things

on it. More environment mitigation, we put some more stormwater runoff is a big thing nowadays. We had -- we're an upstart. We learned a lot. But it is working.

So by moving away from prefabricated metal and moving into cast-in-place concrete, we get better costing.

So what happens in South City for about 90 bucks to 100 bucks a ton tip fee we can do in Napa for about 60 bucks a ton. That's a great, great model right there. That can be replicated through hundreds of communities statewide and 200 by the year 2025.

Now, why did we choose this? We had some huge barriers. We learned lessons along the way, is that we're not going to the pipeline, we're not going to the grid, we go to the tank. We go to our own tanks. We are our offtake agreement. We are our supply of feedstock.

I'm trying to -- I've been in the landfill business for 25 years and trying to do a pipeline landfill gas project -- Evans Williams is here, so he had a great story yesterday. I have bad stories. I won't do that. I keep things outside the pipeline, don't go to the grid. I'm trying to get interconnection. It slowed down all the biomass gasification projects with PG&E. We just can't -- it is unbelievable. We try to do a project. When you go to the grid it takes 100 million bucks in a year and a half. It slows us down. We can't roll out SB 1122 in the

biomass gasification world

So in the AD world, you know, we have the tanks onsite. And we don't even go to the grid and try to get a permit for an ICE engine and it's tough. So a lot of landfill gas guys are trying to re-permit their engine and they won't be able to do it.

So there's no reason for us to go to the pipeline or the grid. We go to the tank, because we have a CNG fleet. We cannot develop RNG if we don't have a CNG fleet in place. So we learned a lot about that.

Okay. A couple of metrics, and I know the report will have more on that, but we had some questions yesterday that we didn't fully answer. But the biomass production is -- we're not up to 3,350 cubic feet per ton. You only get about 3,000. Because it's a blend we're don't have -- we're not given that 67 percent food. The commercial food waste sector doesn't come online until April 1st, 2016, with AB 1826, so we're developing that more food ratio but we have a lot of green waste. So that as we get more commercial food we're going to get more biogas production.

We wanted to go 92 percent methane to RNG with a dual membrane for bio CNG. At the South San Francisco, we're only at 50 -- we predict a 56 percent. We're at 55 percent now. So we're actually meeting the South San Francisco, and we're working with the City of Napa and bio

CNG and GOS Energy to get to that dual membrane to up the methane collection.

Our diesel gallon equivalent is about 330,000 per year. We hope to make that. If we roll out to 200 facilities that's 66.6 million PGs per year. And it's carbon-negative fuel. Right now it's minus 31 by default. And our numbers -- it's amazing. So we don't have a carbon-negative fleet for that one truck that picks up organics. It fuels the recycling truck, what's left of the garbage trucks and then the construction demolition. So it's Back to the Future Part Two is now in 2015.

So this is a kind of amazing story, but we couldn't do it without the city. And Susan Kennedy is going to come up. But along the way, I went in front of the community on Action Plans, the partnership with the franchise, the land use, and the public partnership. What Susan is going to talk about for South City, the same thing with Kevin Miller with the City of Napa. These long-term relationships that we have with local government in all our communities can be replicated quite easily in order to roll out a carbon-negative fleet.

MS. KENNEDY: Thanks very much.

So can we replicate it? I think that I'm in sort of a unique position because when I was still with the City of South San Francisco this project came up for approval

with our planning Commission. And I also happened to be working in the Sustainability Division when we were developing our Climate Action Plan, so I'm sort of in a unique place.

Also, after spending 23 years, or almost 23 years, with the City of South San Francisco, I had an opportunity to see the South Francisco Scavenger Company as a community partner upfront and personal.

And I think that if you read our mission statement, the fact that we're committed to providing solid waste management services of the highest quality delivered with pride and professionalism to all our customers utilizing environmentally sensitive equipment that is safe, efficient, reliable, and appropriate to the work we perform, in carrying out our mission, we intend to provide and maintain the best possible work environment for our employees, fully cooperate with all governing and regulating agencies, and do our part to help create a sense of partnership between our company and the communities that we serve. And, again, I can tell you, firsthand, that that has been the case for as of now 101 years.

A couple of the things that I think make us unique as a garbage company is that we were out front, we started making -- taking measurements in 2006. We put together a Climate Action Plan. We actually -- the

Scavenger Company actually had a Climate Action Plan prior to the city.

We put together our first sustainability report in 2011. We put out our second report last year. And we have made an annual commitment. One of the things, obviously, that is our biggest GHG producer is our vehicle fleet. And so, consequently, to make the decision to move to the dry anaerobic digestion facility and to look at ways to transition our fleet first to biodiesel and then to compressed natural gas, was a part of our commitment to reduce the amount of greenhouse gas emissions that we put out into the communities that we serve. And, quite frankly, the communities that all of -- virtually all of our partners live in and many of our employees.

So this is really something where this is not just about hey people come in, they go to work, they go home. This is a situation where people come to work and they go home to the community that they serve or the communities that they serve. And I think that is also something that's relatively unique.

We have been fortunate enough to be recognized by the sustainable San Mateo County. And we just got some very good news a couple of days ago. The National Waste and Recycling Association named Blue Line Transfer, our sister company, the 2015 Innovator of the Year along with

Zero Waste Energy. So that's something we're particularly proud of as a result of our digester.

The approval process, I think you could say, was fairly smooth. There's a very accessible relationship between our company and all of the cities that we serve. It is not unusual to see some of our partners directly involved, not just in service organizations, but on boards and commissions in the communities that we serve as well.

So when we come before, say, the planning commission or before the City Council there's a very comfortable and, I think, a very trusting give and take. People don't feel like they're being sold a bill of goods, so to speak, because they know these are people who have been in the communities a very long time.

Believe it or not, the people who are currently our partners and they still have -- and then some of their children are now working, but we -- this is the fourth generation -- fourth generation of people who are working for the South San Francisco Scavenger Company Blue Line Transfer. And when you realize that the City of South San Francisco celebrated its 100th birthday in 2008 and we just celebrated our 100th birthday last year in 2014, both the Scavenger Company and the City sort of grew together.

For many, many years this was -- the City of South San Francisco is known as the industrial city. And

it now is known also as the birthplace of biotechnology. So we there's a lot of parallels to the fact that we are willing to look at taking on cutting-edge technology for the work that we do in the same city where you have companies that are looking to try to find cures for cancer.

We are also driven by the fact that some of those very partners -- and it's not just the City of South San Francisco -- it's the City of Brisbane, the City of Millbrae, portions of Colma and the San Francisco International Airport. And so there are drivers within those communities.

For example, the airport, technically, while it's in San Mateo County, is under the auspicious of the City of San Francisco. We all know that San Francisco has very aggressive environmental goals as well. Companies like Genentech. Genentech, we've been collecting compost from them for a very long time. They have a lot of sustainable programs. And, earlier this year, as a matter of fact, in May, just cut the ribbon on a highly green I believe its platinum LEED office building on their campus.

We've also got the South San Francisco Conference Center, which is sort of a subset of the city itself. It is working toward obtaining its LEED certification, and so that's something else where we have worked very closely with them on composting for them, so on and so forth.

The Climate Action Plans, I know the City of South San Francisco has theirs in place, and I believe Millbrae and Brisbane, if they don't have them, are close behind.

But all of this is very helpful when it comes to looking at land use, looking at permitting. When it came time for us to look at building this digestion facility, you know, there were some space constraints, certainly.

But when you look at the positive aspects that this was going to be a dry facility versus a wet facility, some of the complications that come with wet versus dry were eliminated, also, the fact that we were going to be looking to reduce not only our own carbon footprint, but the carbon footprint of the communities that we served, in a lot of respects, it was kind of a no brainer.

It's also very helpful -- Evan, I believe, alluded to the franchise agreements. That is also a very positive aspect. When you have a 20-year franchise agreement, that does make some things simpler. On the other hand, we do go before the city council every year and we give them an update on what capital investments we have made and how those are benefiting and how -- what we're accomplishing along the way.

This grant opportunity was huge. It -- you know, the facility fit into our program, it fit into the city's.

We are -- "we" being the South San Francisco Scavenger Company -- are actually mentioned in the City's Climate Action Plan because one of the things that we're in partnership to do is to convert 86 percent of our fleet to low- and no-emission technology. Well, the approval of this project dovetailed altogether with that very, very nicely.

One of the other things that I think is really a big thing for us -- and this is a picture of our ribbon cutting last September -- we had members of each of the city councils of the cities that we serve on hand. It was a very happy day. It was also a very beautiful day in South San Francisco. We always like those. But I think that, again, it's very indicative of what I would call the partnership, a relationship that we have, not only within our own company, but with the communities that we serve.

I was talking to one of the partners earlier this week, and he said something that I thought was really probably pretty perfect for today, is that one of the advantages that we have in our company is that if we have to run something up the ladder, it's a stepladder, not an extension ladder.

(Laughter.)

MS. KENNEDY: And I think that that also kind of holds true when we're dealing with the municipalities that

we serve.

So, Evan, I'm going to bring you back up. I know that's the -- the touchy/feely part was the quick part.

But the collaboration, I think, has been key for us. And I think that for projects that are going to move forward in other communities, that may or may not be able to be replicated, but it is certainly something that I think would be productive ahead of time, would be to kind of make sure you've got that groundwork laid. But this is something that's certainly possible, and I think can make a difference in those communities as well.

MR. EDGAR: Thank you, Susan.

I'm going to close out here by -- with this chart that shows a closed loop system. (Indiscernible) our economy. Everything is local, local. We don't have to depend on big oil, big waste, big utilities. But, from that, we're making our own fuel and making digestate for big soil in order to have that be the next forward step to sequester carbon. And that's been underutilized, though, by having compost and having -- go back to the soils of California, that will be the next big thing.

So, to close out, it has been zero waste. We can do it. We're a net zero facility with carbon-negative fuel.

So thank you very much.

COMMISSIONER SCOTT: Thank you very much for that excellent presentation.

Let me turn to our reviewers. And, Corinne, would you like to go first, or should I start with Clark and come this way?

MS. DRENNAN: Why don't you go backwards?

COMMISSIONER SCOTT: All right. I'll start with Clark and come this way.

MR. WILLIAMS: Clark Williams. Thank you, Susan and Evan.

This is certainly a project I'm really excited about. And kudos to the CEC for funding this one. I'm really excited to see the six-month data come in. It will be (indiscernible) to get a look at that and see how that might affect some of the pathways that (indiscernible) LCFS as a well.

Certainly, the state has a number of ambitious activities underway. We're actively working on the reducing (indiscernible), includes methane from landfills is a huge factor that's based -- in fact, you know, there's discussions right now about the fact that we really need to move away from that practice in light of 2025 for all intents and purposes eliminating landfill organics.

I think these type of projects are going to be instrumental in us achieving that, as well as our other

policy goals, such as, 75-percent reduction landfilling of materials, eliminating use of ADC in green waste for (indiscernible) credits, and also providing generators, organics, a home, a place to recycle these materials.

When I think about the, you know, waste industry, a lot of folks say, "Well, you know, the trash truck comes and takes away my waste. Where it goes, somewhere far away." You guys are unique, where it's really, as you mentioned, at a local solution and here you're handling this material in an urban environment with high-tech neighbors. And it seems like you're doing it successfully so far.

I was hoping you could speak a little bit to what it takes to make that successful, to be able to have this operation work in this urban environment and process, what I think many folks in this room will know, can be a material that has some odor associated it.

MR. EDGAR: Good question. We work with -- each county has a local enforcement agency on behalf of power cycles (indiscernible). So the county has inspectors, they come out every month to look at our transfer stations and recycling facility anyway. So what we put together was the Odor Impact Minimization Plan. Some of the improvements that we had to do on-site, the cost overrun, what it had to do with, put in extra drainage and extra controls for odor

and for drainage. So we did some more mitigation than we expected, but it's been very beneficial.

On upstart, we did have -- when we were commissioning the bladder, we did have a situation where we had one that hiccupped in a community when the wind wasn't blowing in South City for three days in a row. We had a very --

MS. KENNEDY: Very rare.

MR. EDGAR: Yeah. We had to work the bladder and it was a standstill. So we did have that one complaint. We got everybody involved, they understood. And since that six months, we haven't had that -- seven months, we haven't had the problem.

But by having a good local enforcement agency, boots on the ground, and working with them on the permitting, with a power cycle, we were able to have mitigations in place through the land use to make it work.

MR. WILLIAMS: That's really encouraging to hear.

You talked a good bit about the economics for the project. And, really, one of the things I took away from, you know, going through the report is (indiscernible) supports that tip fee, which you mentioned about a $90 tip fee. Didn't hear as much about the revenues associated with increasing the fuel and also the digestate that (indiscernible) says is going to accomplish this. I'm

hoping you can touch on the revenue streams from the project and also how some of your local government partners here franchise offered for -- you know, what their interest is in any revenues and kind of how that's been dealt with through your contracts with them.

MR. EDGAR: An innovator is a tip fee, for an average transfer station is from 90 to 120 bucks a ton. So having a small-scale facility, the price point was a little higher than over in Napa, it was about 50 bucks a ton, because of its small scale, but there's enough tip fee there in order to get that revenue.

With regards to the expenses -- well, the revenue on the RINS and LCFS2, we have a line item, but put down zero, because working with our banks, our banks aren't going to monetize that or look at that as long-term revenue because there is just no certainty. We've been working last year with the Bio Association of California to have some kind of bank reserve, working in Alaska with some type of renewable RNG standard as long term certainty. But until that's there, we still have that line item and it will be zero.

We are applying for the cost to do that business at a small scale, to apply for the RINS and LCS2s at a lot of administrative cost for such a small scale, but we're doing that anyway with ICS. So we will have in our

application and -- to get some benefit in a volatile spot (indiscernible) market that will be a revenue source.

With regards to the digestate, we keep it as clean as possible. Our deal is that we want to be able to take the digestate, we're taking it down to ZBest Facility down in Gilroy where it goes right into -- to be matured. When the digestate leaves it, we do have an investable compost here, but it's not -- it hasn't matured yet. ZBest has been in the business since the '90s. So we take it down there and we kind of let it mature and finish it off and screen it. There's some plastics, you know, that's part of it. But it is a cost center. So by transporting the digestate down there, but by keeping it cleaner, it's at the end that we discount price and it's a raw product going into composting.

With regards to the total cost, you know, each year we got to true up, and I turn that over to Susan Kennedy as to how they deal with the franchise issues.

MS. KENNEDY: So, basically, they take that to each of the city councils on a regular basis. There's an annual review. There's an annual proposal. I don't have all of the details with me on what that percentage is, but that's typically dealt with in partnership with the Public Works Department. But, again, that also comes back to the fact that when we make the report, we talk to them about

what our capital investments have been, where we are, where we're going, what that's going to translate into, so that there's -- so it's very clear, not only to the elected bodies, but to the public, in general, where the money that they are paying either as residential customers or as commercial customers is going in the big picture.

MR. WILLIAMS: That's very helpful.

And then as far as the biomethane does that have a higher value than the natural gas you're replacing to you as the company or is it pretty much --

MR. EDGAR: I see where you're going. Good question. How we do it right now is the truck, the CNG truck, we're just paying the index CNG rate. So internally that biomethane goes -- we have to pay that price anyway whatever the market rate is, that's what it costs.

So we track that, so -- for the biomethane. So we use a tip fee on the front side to pay for -- you know, to make the biomethane. But to sell the biomethane, it's just an indexed price that we would have to buy anyway.

It goes from the transfer station into the Scavenger Collection Company. So that's a transfer of a different company that buys -- that Scavenger's buy the fuel from the transfer station at the market rate.

MR. WADE: Okay. Thanks a lot.

So we are still struggling with how to get

smaller firms into the LCFS and how to streamline the application process for carbon intensities for projects such as yourself. Do you have any feedback on that process or -- I mean, I can't recall the details of how far you guys have gotten, but I'd be interested in hearing that.

And then another question I would have is sort of what prompted the move to use the biomethane as a fuel, right? Because we're certainly looking for more of that in our program and obviously, there are alternate ways you could use the biomethane from AD.

So if you could touch on both of those?

MR. EDGAR: Yeah. Good points.

We have a partnership with Clean Energy. They have a fueling station there as well, so we can work with Clean Energy as a "blue gas" we call it, and plus they have a green gas -- they have a (indiscernible) back this from SRF and a clean energy renewable fuels. So they're handling that for us with ICS, so they take a percentage. So with their market power of knowing how to go through the system and a lot of their expertise, they have an administrative fee in order to manage that for us. And there anyway with blue gas, we're able to do that effectively.

We tried to do it with another firm initially and it was too much of a learning curve. So, by having that

relationship with Clean Energy we were able to do it cost effectively.

The second question had to do with why biomethane. Well, you can't put anything in the pipeline in California, the PUC, the new rules, even the good stuff you can't -- it's tough to do. And then that's -- and then the interconnection, you know, whether it be any big utility for small-scale guys like us, even big scale, it's a show stopper. We don't even try. It never even was feasible to start with. Why go there when we have our internal offtake agreement with our own fleet.

MR. WADE: Did you consider 10 cents or anything else like that or did it --

MR. EDGAR: (Indiscernible) permitted there, a new one. Why do that? I'd go to the tank, not to the grid every day, because we got diesel like CARB wanted us to do. We made a big investment with 40,000-50,000 extra dollars for a truck. So we're on CNG now. It's a no-brainer to have biomethane going to CNG, but we want CARB to step up to help us out. On a Heavy-duty fleet, Class 7, Class 8 we can't EV up. We just got off diesel and now you want us to get on EV? Ain't gonna happen.

So you guy needs to step up and help fund the transition for a CNG fleet, because we're stepping up doing our part to get off diesel.

MR. WADE: Understood, all right thanks.

MR. KAFFKA: It looks like when you wrote the reports (indiscernible) you guys had met your goals and perhaps exceeded them and congratulations on an exciting, successful project.

My interests are a little bit in the digestates. So it sounds like you are transporting about 70 percent moisture content material to Gilroy, presumably using diesel truck?

MR. EDGAR: Currently we are, right.

MR. KAFFKA: Yeah, now do you account for that carbon cost in your project as part of your CI?

MR. EDGAR: That's a good question. As part of the footprint of the company yes, we do the Climate Registry. And we're a voluntarily reporting that since '06. So the company definitely includes that carbon with regards to transporting it, so the company reports that in the Climate Registry.

With regards to the CI I'm not sure what the default value is, but that was the report we're giving to Hugh, yes. But regards to the carbon model, I'm not sure what the car. given to Hugh, yes. But with regards to the carbon model, I'm not sure what the carbon model does in order to account for that default value of minus 30. But specifically we have to do that as part of our full cost

accounting on greenhouse gases, so yes.

MR. KAFFKA: Okay. So you can take it down to zero waste. So presumably if you could compost it next door or onsite or close you'd have a lower carbon intensity medium.

MR. EDGAR: Well, great leading question. Yeah, Kevin Miller at City of NAPA, we have in that project an onsite (indiscernible) compost facility area. And by going into residential, getting the food waste out of residential, we're going to cover areas of that pile, which is BACT, for composting.

So actually as part of that project where we were able to use this SEED money from CEC was a big -- 3 million was a big impetus in order to do the cast system, to take care of the digestate, a whole new stormwater system, because stormwater pollution prevention plans are tough nowadays at the Water Board for doing that and the Air Board. And so yeah, it's possible.

MR. KAFFKA: Thanks, so a couple of more questions related to that. So when that compost goes down to Zero Waste do you take any -- presuming you could actually come up with a number for carbon accumulations solely, which I think is a difficult task. But assuming you could, would you take credit for that as part of your CI or does take credit for or Zero Waste, or who gets that?

MR. EDGAR: Right now, how we manage that is that we only account for the (indiscernible) landfill emissions in today's CI. It's all you even can do, is just avoid landfill emissions; otherwise that material's that's gone to the landfill to create methane. With regards to the CI, with regards to -- we can't account for it. It would have to be the farmer or the user or the vineyard.

The Marin Corman Project (phonetic) is a great example of how the metrics for -- (indiscernible) carbon or the (indiscernible) Napa Carbon Project as well with all the compost going to the vineyards and initiating a protocol for compost use for the user of compost to get a credit for that, because they are making a decision. And do we want to work with CFA with the Healthy Soils Initiative to do that? They're not there yet and we're looking for different comparable case studies in order to make the science better.

There is a number now on the life cycle on a greenhouse gas reduction factor for compost use. I think it's 2.4 per tons, so there is something now. I think it can only get better with better science.

MR. KAFFKA: Yes, (indiscernible) Last question, in your description of your dry process you talk about ammonia stripping. What's the fate of that nitrogen?

MR. EDGAR: Good question. My engineer is not

here today, but --

MR KAFFKA: Is it voided basically as N2 gas?

MR. EDGAR: You know, I can't answer that today, but it will be in the report. But I'm not sure of the data today.

MR KAFFKA: Okay.

MS. DRENNAN: The complexities of the waste management industry are absolutely fascinating, so thank you so much for the presentation. And I do hope to be able to talk with you another time in addition to this experience.

So I'm curious as to how you might go about replication. There was an awful lot of discussion about partnerships with the community, but after RCRA Subtitle D in '93 and the requirement for sanitary landfills, it seems like waste management companies just gobbled each other up. And there are maybe 13 very large ones now, so I'm curious as to how you survived that.

But also I'm curious as to how you might engage them, at least one of whom is on your client list to help you replicate this type of model.

MR. EDGAR: We answer to Main Street, not Wall Street. And with (indiscernible) a big margin, 40 percent for landfilling. And I think that the Legacy Landfill gas in place needs to be taken (indiscernible) is doing that.

But we should have no incentive to put any more organics into the landfill, so we're not conflicted. Like I said we don't own landfills, we own the trust of the community.

And knowing that we have this ability to partner locally and throughout California independent of taking back the turf we were gobbled up in the late '90s, but we were ungobbled, because of the fact that we do have omitted programs. We don't send our profits to Wall Street, we keep it local and we're able to take a lot of cities back from Waste Management. We do the right thing. We don't use a lot of (indiscernible) landfills. The incentives by big landfills are to use organics at the landfill for (indiscernible) sliding credit.

They have huge margins and it's too cheap. We have 1.5 billion tons of capacity of landfills in California and it's too cheap to meter. So we need the SEED money from CEC in helping CARB, because of the fat that local governments in some markets would rather go to the landfill. Because they don't have the sensitivity of the Bay Area's Climate Action Plans.

The City of L.A. stepped up, but you go to Inland Empire, you go to the Central Valley, they're going to go to the landfill. They go to the fill, not to the tank. So it isn't to try and part with the big guys, they've -- yeah, we keep it local.

MS. DRENNAN: So these big guys also have the ability to procure the permitting and whatnot that are required to operate these gigantic sites. Perhaps they might also have the bandwidth to enable access to pipelining the Grid in a way that you might not be able to achieve?

MR. EDGAR: We never needed big landfills or big waste. We don't need big utilities or we don't need big oil, so why do that? We keep it local and we have the innovation to do it right.

MS. DRENNAN: Okay. I only ask, because I'm curious about replication and how to do that.

MR. EDGAR: Well, we replicate it locally away from landfills. We replicate it with private independent companionable throughout California that want to do the right thing. And a lot of cities are there, mostly on the Coast and the Bay Area and the City of L.A. now, bringing the L.A. market up. They raised the bar and Paul Relis will be talking, at the CR&R and what they're doing in Southern California is great work. So that's how we're going to do it. We're not going to partner with landfills.

MS. DRENNAN: Okay. Fair enough, well thank you. I only have one more question. It's about flow controls and I'm wondering if those present any barriers to you here and if there are any policy needs for those in California?

MR. EDGAR: That's a great question, because when you keep it local and small, 100 tons a day and within a franchise -- we're not the flow control of yes, your waste energy plant back East or your big facility that you -- A big waste energy facility like Plasco tried to come to Salinas to do waste energy, 1,000 tons a day, 100 bucks a ton, $100 million, no RPS and no waste diversion need flow control. Because the waste stream, you've got it all mixed up with mixed waste and mixed messages. Who wants that?

So no, flow control is for the big facilities, but your franchise at the local level, we have enough within the community of 100,000 people to have 25,000 tons per year organic waste to have our model. So any city of 100,000 people have the right size, circular economy, they have enough organic waste to fuel the trucks to keep it local.

MS. DRENNAN: So this is not going to present a challenge for most municipalities in the State of California?

MR. EDGAR: Not at flow control, at quality control.

MS. DRENNAN: Quality, yeah.

MR. EDGAR: And that's what we do.

MS. DRENNAN: Okay. Thank you.

COMMISSIONER SCOTT: Great, thank you so very

much to you, Susan and to Evan, for the very terrific presentation and our reviewers for their thoughtful questions.

We have next on our agenda is Tom Koehler. And I'll let Tim introduce him. For our time check we'll give you until about 11:25 to do the presentation and then the reviewers until about 11:45 to ask questions. Go ahead, Tim.

MR. OLSON: So yeah, and I think Tom does not have a PowerPoint presentation, so it might be shorter than that. But I'd like to introduce him. He's Vice President from Pacific Ethanol.

The Energy Commission awarded money awarded to Pacific Ethanol and two other companies: Aemetis and Calgren about five years ago for kind of an early version of a production incentive. We refer to it as CPIP.

They also won a competitive award for green sorghum feedstock contract. They operate two projects in California, corn ethanol they're trying to look at these lower CI fuels. And they also acquired Aventine in Illinois, so they're now much more nationwide as company.

MR. KOEHLER: Okay. Thank you. And it's great to hear all these other projects as well. And I do think that the CEC's program is very complimentary to the LCFS and has been. And so the continuation of those programs

and collaboration, I think, is really important going forward.

There is -- and I guess what I like to talk about what you've heard about, the performance concept, and actually every grant that we've been involved with has had a performance measure put into it.

And then Steve, you talked about the tension between commercialization and getting reductions today versus breakthrough technologies. And I think that's a legitimate question and I think the answer is we need both.

There's not enough funding right now to do both, so that's why we joined together with the biogas folks and diesel replacements as a Biofuels Initiative on our asking the Legislature for $210 million from the Cap and Trade money. To come to CEC to essentially -- in a siloed approach, because all these fuels are different and have different needs. But with that money the gaseous fuels can create a performance-based program that includes infrastructure needs, the diesel replacements, and the gasoline replacements.

And so ultimately, I think that's a great use of those funds for getting the performance. And maybe the existing 118 Funds can be uses for more R&D potentially. I'm just kind of thinking off the top of my head, but there's no doubt we need more resources and all the fuels

need them.

So just to review, the CPIP is -- that was five years ago, it was very successful. So it's been money well spent. It actually helped get -- it was right at the beginning of the great recession, the bust of the industry to a degree and the middle of the bust. And so it helped us get our plant back up and running and we haven't stopped running since. And so we're providing the local economic activity.

It was a innovative program, because it only kicked in as support for the producers when margins were very low. And then it said when margins get high you pay it back. So it's actually the only program in the history of the 118 that has returned the money. So I think that's a success as well.

So and it got pulled short and that's the other question you'd asked about what are the -- what kind of performance? If you're doing a performance what's the lead time and how much is it? And I think that was envisioned to be a seven-year program and it turned into a one-year program. But the one-year was useful enough.

We're now in another performance-based program that I think is rather innovative, which is with the sorghum. We're doing it in collaboration with the other ethanol companies in California who also won the awards.

And that's performance-based, because the bulk of that won't -- the money won't get spent unless we run sorghum through our plant.

And there is a portion of the funds which are going right now into working with the university system and doing test plots for sorghum. And with various degrees of water just to see what that looks like. And working -- going out and marketing and working with the farmers. So to get farmers to switch to another crop that they haven't used in quite some time, you know, it's going to take time and we know that.

But it's worth the investment and effort. We want to do it not only with sorghum, but with other crops. So this is (indiscernible) a way to diversify what we're doing, not stop what we're doing, because corn is actually a very good low-carbon feedstock.

So I would say in summation that the projects that we've been involved with have been successful. They've returned the investment in terms of both carbon reduction and economic development. We are, combined, the three ethanol companies, the four plants are the largest in-state contributor to LCFS compliance to date. So that's significant. We're a success story. We're going to continue to invest. We're an existing facility, so that gives us a platform to continue to invest in the lower

carbon. And having a performance-based program, not only will help us, but it will ensure that the money is well spent.

So I'll just leave it at that.

COMMISSIONER SCOTT: All right, great. Thank you, so very much.

I would love to ask you a question. You mentioned that one of the challenges potentially for finding new feedstocks was getting the farmers to want to grow and learn about a new crop. Are there other challenges like that, that you're seeing when you're trying to diversify the feedstocks that you use?

MR. KOEHLER: Well, from purpose grown -- so I mean, the challenges really are can it work into the economics? So that's the largest challenge, because the farmer has a lot of decisions and opportunities to make. And so does what we can pay the farmer work for them in a rotation, perhaps. So it's got to be mutually beneficial, so finding that is the important thing.

Other feedstocks, the cellulosic -- I mean, we're actually making cellulose ethanol today from the cellulose portion of the corn kernel. And so that's the easiest entry into the cellulosic. When you get into other feedstocks, right now yeah there's big challenges.

Collecting them is -- and the whole system of

moving through a manufacturing is a big challenge and then there's the technology, which is not today -- for a large scale is just not commercial at the moment.

But back to the performance, because it's really what do we need in the State? We need carbon reductions. And we need tons reduced and we need to do it here, so we believe that we're going to continue with our current feedstock to get lower and lower and as we're successful talking and diversifying with other feedstocks that will add to that.

COMMISSIONER SCOTT: Okay. Thank you.

Let me turn our reviewers and we'll go with this latest panel. I'll start with you, Corrine.

MS. DRENNAN: Well, congratulations on being very successful and also for putting an awful lot of skin in the game. That was a surprise in reading through the materials.

So now that you're up and going, is there a potential for expanding your plant to enable the further diversification of your products like by using ethanol?

MR. KOEHLER: What do you mean by that?

MS. DRENNAN: So there are things that you could make with ethanol that could be highly value-added, that also could benefit from lower carbon intensity. Would those be options for you in coming up against a market that

seems to be somewhat barriered by the perceived blend wall?

MR. KOEHLER: Maybe you can be even more specific? I mean, what are you thinking exactly, because I can talk about the blend wall --

MS. DRENNAN: What I'm thinking exactly is that there are people that are developing technologies that would take the ethanol and make it into jet fuel. And they would love to have an ethanol supplier.

MR. KOEHLER: Well, I mean we'll go to any market that works. Personally, we haven't been doing the R&D on that. I think maybe another company, one of the other ethanol companies has been. And if that technology matures that would be a great use.

MS. DRENNAN: And what about your CO2?

MR. KOEHLER: We're, right now, looking at various options for that. You know, one is just capturing it and taking it to the beverage market. The other interesting option is to take it and go to the oil wells with it. And to begin that's market-driven. And right now with the price of oil that market's not acceptable, but those are the kind of things that we're looking at all the time.

And in terms of the blend wall, Sam's going to take care of that (indiscernible) so we're confident that's going to happen, soon.

MS. DRENNAN: Okay.
COMMISSIONER SCOTT: Great, any others?
MS. DRENNAN: Yeah, but I'll take them offline. Okay.
MR. KOEHLER: Okay. Thank you.
COMMISSIONER SCOTT: Stephen?
MR. KAFFKA: Are you processing any sorghum now or have you been?
MR. KOEHLER: No, today no. But we did in the past and what happened -- and successfully we learned some things about it. And so part of that program is to process -- so that the growers can see that it can work.
MR. KAFFKA: You have the capacity?
MR. KOEHLER: Yeah, that we have the capacity. And we plan on doing that. And again, I think, it's illustrative of some of the world that we live in, where the market just went through the roof, because China started just gobbling up any sorghum available.
And so that sent a nice signal to farmers, but then it took the product out of the market for us in terms of economics through the plants. So it's just a little balancing act and I think we're going to get to a point there that that's going to be put back in balance.
MR. KAFFKA: It looks like you have a long list -- in the proposal that you submitted and was approved -- a

long list of objectives and tasks. So did you install your AGT system? In other words, I guess that's a general question about how much difference there is between processing and sorghum. I guess you were going to install an AGT system.

MR. KOEHLER: Yeah, and I don't know off the top of my head whether that's been done in our plant or the other plants, but it's definitely a -- you know, needs to be done in order to make it work.

MR. KAFFKA: There's a component that's associated with, of course, UC and (indiscernible) Fresno. Are those projects, going forward, those research projects?

MR. KOEHLER: Yeah, there's over 40 plots right now that are going forward and we're looking forward to getting the report, I think in November.

MR. KAFFKA: Yeah, your first progress report on that?

MR. KOEHLER: Yeah, yeah.

MR. KAFFKA: It's a tough year to try and introduce crops here in California against the drought standards. But just to support your interest in this crop I think there is -- or our work indicates that there's economic room for this crop existence in the State. So it's just a question of having the right kind of farming conditions available. Hopefully, we'll get back to doing

that.

MR. KOEHLER: Yeah, right. So you've got market and weather, but we think so too. And it's also a matter of figuring out just the best way to do the marketing to the farmers.

MR. KAFFKA: So what you're saying is you're really not expending much in the way of resources other than on the research end of this or the development into this until there's a sorghum market that you can participate in?

MR. KOEHLER: Yes. Yeah, at the moment that's true. And we think that will actually be in line and getting in sync with the growing season coming up, so that we'll be able to do both -- bring the sorghum through the plant, source it, both in and out of state, as well as get the farmers interested in a longer commitment.

MR. KAFFKA: One of the potentially attractive things about sorghum at least in arguments to me, is that it somehow going to reduce the carbon footprint of the feedstock production.

MR. KOEHLER: Yeah.

MR. KAFFKA: And if you do -- determining that, I guess, would be a function of the research projects that are going on?

MR. KOEHLER: Yeah, and also I mean we've been

working with the Air Resource Board and working through our CIs. And so it looks like we'll have CIs that are lower than what we're doing today.

MR. KAFFKA: And mostly that's based on the standard pathway for CIs for sorghum that the Air Board uses compared to grain corn?

MR. KOEHLER: Yes. And then some of these -- you know, what we learned in trials and actual instate activity will give us more information. And hopefully allow us to go back with better information.

MR. KAFFKA: Yes, most of that's still pending?

MR. KOEHLER: Yeah.

MR. KAFFKA: Okay. So that's it.

MR. KOEHLER: Yeah, good.

COMMISSIONER SCOTT: Sam?

MR. WADE: I just wanted to go back to some of the concepts that Harry raised earlier (indiscernible) on a few of them.

MR. KAFFKA: Yeah.

MR. WADE: So there was a peer-review process for the larger portion of the -- or the larger projects that are considered using 118 funds. What would that look like in your mind or give me a perspective if there was sort of an ethanol industry peer review, was that something worth entertaining on your side? You're on about equal sides, if

you guys would be interested in that, but --

MR. KOEHLER: You know, I guess in my head it's continually focused on the performance-based way of going about it. And so in that sense it's not -- the peer review is not important. But it's really you're going to know if it's working and you're looking for tons reduced, of carbon. So I think in ways that we can keep things simple, we ought to. So I hadn't given the peer-review process a lot of thought.

Certainly getting in experts to help that project is a good idea, always. But I think just trying to keep things -- you know, Lisa Morgan said it yesterday too, which is (indiscernible) a lot of fun there. You know, just try to keep things as simple as possible is a good --

MR. WADE: Harry also touched on the need to ensure (indiscernible) provided long-term though. And you guys had some experience with that, right? I mean, is there anything you learned from your experience with this specific mechanism that could be translated or used more properly by the CEC?

MR. KOEHLER: Well, I think it was -- yeah and I also want to say, because again the silos are important. Every fuel is different and so I'm speaking to our fuel, and it is really important to look at each fuel type individually. But from ours, we're in a -- the reason the

CPIP was attractive is because of a couple of things.

From a framework basis we're in an industry where all of our competitors -- and there's lots of fuels coming into California from elsewhere -- all our competitors for the most part are producing in states that have had years and years of support for them. And so in that context how does California support its industry, because otherwise we'd be just importing everything and industries go up and down, so having a safety net essentially. So we looked at what other states did and made it better, I think, and less of a -- you know, we made it more of a performance-based. And there when you need it.

So I think conceptually, that's a good thing to look at. And but it wasn't -- if you look at CPIP versus what we're suggesting with this larger coalition the larger coalition concept is more performance-based, because you're actually going to be buying tons with the money. Whereas the CPIP, I mean it was inherent, but it wasn't explicit. So I think that approach that the Biofuels Initiative is taking is really a great approach.

COMMISSIONER SCOTT: Clark?

MR. WILLIAMS: Thanks, Tom. I don't have additional questions for your project.

COMMISSIONER SCOTT: Okay.

MR. KOEHLER: Thank you.

COMMISSIONER SCOTT: All right. So we have last, but certainly not least, Paul Relis who will speak to us. And for our time check, Paul, if you could have your presentation completed by about 11:50. And then we'll have the reviewers talk to you until about 12:10. That's what we will do there and I will let Tim introduce you.

MR. OLSON: So Paul Relis is Senior Vice President of the CR&R, it's a waste hauler in mostly Southern California, in California. And also previously was a appointed board member of the Integrated Waste Management Board, which is now known as CalRecycle.

And the project -- the Energy Commission funded the Phase 1 of what I call a regional biomethane production plan where they're using a few onsite, but also they're gathering waste from other cities. And CalRecycle is funding Phase 2 of that project and so Paul will tell us more about that.

MR. RELIS: Thanks everyone for hanging in here. And I'm going to -- Okay. Can you hear me okay?

COMMISSIONER SCOTT: Yes.

MR. RELIS: I'd like to start by just saying that Evan and Ms. Kennedy -- sorry I don't know your -- Susan provided one of the perspectives about our industry. We're also in the solid waste industry, but I'm going to talk about a different model and a different scale that is what

we presented to the CEC when we submitted our original proposal and to CalRecycle.

Ours is what I would call a regional model, a business model where we're dealing with minimal units of about 83,000 tons per year per phase. As opposed to say 25,000 tons roughly, but still interfacing with municipalities and with truck fleets and the whole infrastructure that goes into our business.

Our business is deceptively -- I thought you made a great comment, Corrine, that it's a much more complex industry than people might think. You know, it's not just trash or organics now. We've have a complex world that we deal with and that was reflected in our proposal.

Yesterday, I talked about the issue of securing feedstock and offtake agreements. And I won't repeat that. I think we will demonstrate, in this presentation, that we have successfully navigated the first two phases of the feedstock challenge and that is a critical challenge.

I took the project through our permitting in the City of Perris. The City of Perris is a relatively small city, I think it's now about 70,000. I think when we started this project it was 50,000. It's in that fast-growing area of Southern California, or at least it was. And we had a spectacular experience with this small city in permitting our project and now in all four phases.

So I can't say enough about that, because ever as was suggested with South San Francisco, this has been a partnership with the city. They recognized at the outset that this was something that could be very important, not only as an employment economic base -- because Perris is a very poor city and we are a large employer in Perris. And that relationship couldn't have been better. And the fact that we have permitted the facility there, it being a regional facility -- we've essentially permitted many cities' facilities, because they're participating in this.

Unfortunately, like the other companies we're not operating yet. We're about three or four months from operation. I'd like to be able to give data on our gas and our digesting, but these are matters still to be developed and presented to you as the project moves from construction to completion and operation.

Just to underscore -- and I'll go through this is in a few minutes -- we're about 90 percent completed. We've been under construction for nearly two years now, it took a little longer than we thought. And we are in the sort of agonizing stage of the process controls. Our project will be largely automated, so in the sense that from the time the material comes in to the time it leaves it's fully enclosed. And it's mostly processed controls. And I'll elaborate in a few minutes on that.

So let me in the slide presentation suggest our project's at four phases, 335,000 tons capacity per year, in Perris, California, Riverside County.

Let's see, which is the forward here?

MR. OLSON: Your up is the arrow.

(Colloquy regarding slide setup)

MR. RELIS: I'll bypass the little promotion that -- essentially what you're going to see is the kind of presentation that we give to the cities that are our clients and that are critical to the whole performance of this project.

So let's start with the infrastructure of the company. We have 50 municipal contracts and 12 processing contracts. A municipal contract is like what Evan -- a franchise agreement -- may range from five years to evergreen. Evergreen means they're open-ended. We have 12 processing contracts where other companies use our facilities to process material.

We have about 900 trucks in our system, 1,500 employees. We serve over 2.5 million customers. We have 10 solid waste service centers, 5 transfer stations, MRFs. We have 2 landfills in Arizona and 12 of a company called Holloway, which is a container company.

We are a 50-year old company, so we're not 100 years old, but we're semi. We have extensive experience in

all facets of waste management. And I need to underscore that. Projects are conceived, in some cases without that underbelly of experience. And that's hazardous in this business. It's a challenge enough -- I liken moving from the old waste industry to AD and all the related parts -- that's almost like rocket science for this industry. It's a big step.

We've been a leader in innovation and technology. We introduced the three-automated cart system in California. We were the first to build a mixed-waste processing facility, a so-called MRF. We were the first to employ large-scale application of biofilter in a transfer station environment to control odors, which someone mentioned is a big deal in our industry -- odor control.

We have an experienced and qualified management team. And we have a remarkable record of municipal contract retention, all of it.

So just a quick thumbnail from the waste world, and I used to regulate this world and now I'm part of the regulated. This is the world we were in, in the '70s -- pretty simple: trash bags and cans and landfills.

Then we hit the '80s and in the late '80s, as Evan mentioned, we went from that simple system to the recycling, the embryonic recycling efforts, and now you see on the right-hand side the recyclables.

In the '90s we evolved further and we started to build material recovery facilities, sophisticated by our history, but nothing compared to anaerobic digestion. And then we introduced the three automated containers, sort of the normal platform for waste services in California.

And now here we are, around the decade of 2010 to 2020, so we see the Material Recovery Facility. And now we introduce this whole new compartment called anaerobic digestion. We still have those three cans, but look at the -- we just only have that top picture. Then we added the recyclables. Then we added fuel to compress natural gas initially and now renewable natural gas. And then we'll be at fertilizers, some soils in fertilizers. We hope to be in the fertilizer business just we're not prepared to elaborate on that yet, because we haven't produced strong material.

So let's just step back and we take this quote. This is a favorite of my colleague at CR&R, Mike Silva, who is our Project Manager. He went to Stanford, so he likes to tout this: "Supplying energy to a growing world population while reducing greenhouse gas emissions is one of the great challenges that we humans must face this century." And no one know that better than the State of California with its leadership.

Now, we've talked about the team. Various people

have mentioned how important a team is to project success and I couldn't underscore that more. We think we've got an A team. We're using a anaerobic digestion technology from Eisenmann Germany which has about 80 digesters, mostly smaller, much smaller. Ours will beat their largest digester in (indiscernible), our digester system.

We have Greenlane providing the biogas upgrading technology to clean up that biogas to produce fuel. We are very fortunate to have, as our primary contractor, Lyles Construction, primarily based in Fresno but with offices throughout California -- very experienced in wastewater construction, heavy concrete, the kind of stuff that our project requires.

And our Project Engineer is JR Miller and Associates based in Bueno Park with 50 years almost of experience in design, development of MRFs and transfer stations. And they've been with our company as a subcontractor to our company for over 30 years.

So we have an excellent team. That team has been tested now by two years of having to be around each other in trying to pull this off.

So let me just give you a brief overview. We will convert all the organic waste we receive into fertilizer soil products and renewable natural gas. Unlike Evan's program we do intend to enter the natural gas grid.

That's very important to the growth and replication at least of our model.

And so we are engaged, at present, with the gas company to achieve that interconnect in the shortest possible time. I can't give you a deadline on that as it's subject to some of the difficulties of gaining access to the grid. And that's a whole subject in itself and I would hope that Air Board and the Energy Commission and CalRecycle will lend what weight you can to overcoming some of the barriers there.

The program keeps all the cities that we serve organics out of landfill. Methane, we know that story, I won't repeat that 26 times, more damaging than CO2 and then the short-lived climate change impacts. We know that renewable natural gas is the cleanest fuel and we're really just replicating nature with our AD system. It's just a giant artificial stomach, but that's a deceptively simple comment.

Our process will run 24/7, 365 days a year, and we want to I guess pick up on the fact that we become a permanent renewable energy source. We're not intermittent like solar and wind, nothing against solar and wind, but we have a special niche. And we would like that more recognized by the Air Board and all the Energy Commission that we contribute something special to the renewable

energy portfolio.

Our process provides maximum flexibility. Some of you have been to our site and have seen the equipment. We basically have four digesters in one unit and what this allows, and why we pick the company, is we can operate mesophilically, thermophilically. Up to four different mixes in temperatures can be run simultaneously. And Eisenmann is the source for that experience in its programming the facility to be able to do that very thing.

We're not -- I'll just jump ahead, one's a little bit of a promotion, so I want to stay away from any promotion. Our process is fully enclosed with zero untreated emissions and we think we have one of the higher conversion rates in the industry due to the design in controls.

We'll handle 335,000 tons a year in four phases, 4 million gallons of DGE of renewable natural gas, and we'll create about 260,000 tons of organic soil amendments. The plant will use recycled water from the local wastewater treatment plants located in the top two miles as the crow flies. I think that line is under construction now.

I won't walk through this, this is just basically the flow chart for the facility. It wouldn't look much different than the project in South San Francisco in terms of flow chart. They're different technologies employed.

So here's what it looks like, a full build-out of the four phases. Do we have a pointer here, is there? Oh, I don't it. Let me take a moment and just -- (refers to chart in presentation) The waste comes in: green waste, food waste, so are separated. And it goes in this building closest to me at the edge. That's an acre (phonetic) building, it's just about completed now. And that's where we do all the cleanup even though we --

COMMISSIONER SCOTT: Hey, Paul? Let me ask if you can -- can we have the cursor pulled out? That way the people who are participating by WebEx might be able to see what you're pointing to. Will that work for you?

MR. RELIS: Oh, yeah.

This building, actually the lower third, the third closest to me right there, that's built now. That's our receiving building. The material comes by conveyor into bunkers. This shows four fully developed digesters, so right now the first one -- right there yeah -- that's all calibrated and weight controlled and it's fed to the digester continuously 24/7 as Eisenmann determines. And don't ask me to please detail what Eisenmann's knowledge is. I'll beg off and I'll find that for you and present it to you.

But essentially, we replicate. And so we achieve -- in one of our statements when we conceived our projects

was that we were going to win in economies of scale. So what have we done to do that? Well, first that separation building is several million dollars and the cleanup system, that works for all four phases. So what's been put in works for all four phases.

The gas cleanup system over there right, that shows a unit we invested in Phase 1 and Phase 2. So the gas cleanup system in Phase 1 also goes to Phase 2. So we sunk those spots into Phase 1 and we sunk the compressors for the fueling station into Phase 1 as well. So Phase 1 is really Phase 1 and Phase 2.

And Phase 2, that one, we've poured the foundations for that unit just a week or two ago. And so that's well underway and the equipment that comes from Germany is on order.

Okay. I won't repeat the benefits of RNG, or the soil products. We think that while composting is great -- and I learned this in my visit to Sweden about seven years ago -- is that they decided they wanted to get the energy content out of organic waste. And when I saw it at work in Sweden I went, "Yeah, that's the way to go. Why didn't we think of that and they were already far along. So that visit was one of our real sources of inspiration.

Okay. Economic drivers, and this is at the core of our architecture of our project. The cities that sign

up first with grant funds from the CEC and from CalRecycle, they get the benefit of a most favored nation rate. And we made that very clear to them. If you want the best rate -- you'll have to do it anyway, but if you want the best rate go now ahead of the curve of being mandated. And I'll elaborate on that.

Using our project provides the city with a sustainable disposal option, which will provide many environmental benefits and long-term even fuel pricing stability, which right now doesn't look so great. But we don't know -- no one knows, but once you produce this fuel it's a fixed cost. So that's not to be sneezed at.

So we'll have relatively constant reducing fuel costs. They won't see the kind of spike when that's in the PULA Program (phonetic) if fuel spikes were allowed to pass that on and through to the cities. And we shouldn't be seeing the fuel spike.

And we use the existing infrastructure. We have the cans, we have the scales, we have the trucks, we have all of that. we're not altering the trucks. All we're altering is the fuel that goes in the trucks and that's really important. That investment is made as part of the AB 9 and 39 era work.

Okay. We all have heard the galaxy of policies and laws that are helping drive our industry, which has

been critical to selling the system to our cities. They want to know if they invest in this how will it enable them to comply with current and future law including AQMD, our air quality standards in the South Coast, which are extremely challenging.

Okay. These are all the galaxy of incentives. The bills, carbon credits, excise and sales tax rebates at the state program that allows us to get a break on equipment that is manufactured here in California from being subject to the sales tax. The equipment that arrives from Germany doesn't get that break.

The low carbon fuel standard, (knocking) I guess I heard someone knock on wood, I'll knock on wood again that that moves forward next week. RIN credits, and now here's where you -- the CEC grant for us -- 4.52 million. Today I believe we got an AQMD grant for 900,000 which will allow us to test the two new engines that I referred to yesterday. And we thank CalRecycle for recently awarding a $3 million grant for Phase 2. That's why we're under construction. Neither phase would be under construction were those grants were those grants not available to us.

I don't need to repeat Evan did a very thorough job on the carbon intensity. We're like him, so we'll piggyback on all of that.

I'd like to just give you why the organics

management system involving AD is so superior in my view. If you look at landfilling you get about 75 percent energy recovery maybe. I'm never sure what that number is, 75 percent emissions capture, no nutrient recovery, no renewable. Well, there might be in some cases recovery in a landfill.

Composting, 100 percent nutrient recovery, but no energy recovery. And now you look at AD, we kind of I think are in the sweet spot of a complete recycling system. And as Evan pointed out an important, this is a home-grown system. This isn't one where we're shipping 8,000 miles our commodities to China and what happens if they stop buying. And this should be an extremely durable homegrown recycling system that should survive long term.

Okay. In summary, we set out in our project objective, to build a regional model and to demonstrate to the Energy Commission, to CalRecycle, that we were capable of pulling this off. I can't say that we knew everything about doing this, we're on the firing line, on the cutting edge. A few before us, but of our scale very, very few and in order to test that assumption our ultimate test is what do our clients say, our cities? Do they want to sign up or are they still treading water and just going, "Well, good luck. And come do us later."

We have six cities signed up now for a capacity

of over 200 -- well about 300 tons a day and by the end of the year we expect 400 tons, probably another four or five cities. Most of those will be in Riverside County initially.

And an interesting observation, these are not cities that you would normally associate with being ultimately green. Their councils are pretty conservative and Riverside County is conservative, Orange County is conservative. Our first city was Costa Mesa, a conservative city, why did they do this? Why would they spend money (indiscernible) when they needed to?

I think that in sum, the whole story is cool. It's just a cool story. You take your banana and the "Back To The Future" -- it's close to that, it's whimsical almost sounding, but it's true. We're really taking the stuff you throw away, your organic -- the ick factor of most solid waste -- and now you get it back as trucks running in your community that are super green.

And if we're right and the Energy Commission, I know, is involved with the 118 Program, with the AQMD, and now we're embedded with the AQMD to test these two vehicles. We may just -- may just, I can't say for sure -- we may be on the edge of a breakthrough in the heavy duty sector in terms of helping AQMD meet its zero emission requirement.

If we do, and we come back in a forum like this hopefully there will be the Air Board and AQMD and the Energy Commission and we'll have a love fest if that were to happen. But it's a little too early to say, so I think I'm almost on time. You wanted me to leave ten minutes for questions?

COMMISSIONER SCOTT: Or maybe 15 or so for the reviewers.

MR. RELIS: Okay. And I'll do my best to answer, but I'm more architecture guy, the policy, the development of the system. Not all the fuels, details and so I'll do the best I can.

COMMISSIONER SCOTT: Okay.

MR. RELIS: If I'm in doubt, I'll refer you.

COMMISSIONER SCOTT: Thank you very much, Paul.

So let's turn to our reviewers. Are we starting with Clark this time? Yes, go ahead, Clark.

MR. WILLIAMS: Thanks Paul, a great presentation. Obviously we're really excited to see where you're at a few months from now when the plant's operational.

Evan had discussed earlier, that in working with their clients they're projecting kind of a zero value right now for RINs and LCFS credits. And I got the impression from your talk that maybe your company's viewing RINs and LCFS credits a little differently. So I was hoping you

could address to how you're viewing the value of those?

MR. RELIS: Well, we have a specialist is that hold area. We have a specialist who is handling our LCFS credit side. And we have put in our model, but we did not predicate that this wasn't a survival issue. If we didn't get them, it would be painful, but not fatal. I guess that would be the way I'd answer that.

MR. WILLIAMS: Have the cities expressed an interest through your contracts with them, in having their rates reduced if you are able to generate values through those or are they --

MR. RELIS: Okay. That's a good question. We laid everything out on table in terms of RIN credits, if possible LCFS. And what we arrived at through -- and each negotiation was very different, but basically we said, "Look, here's the value of the gas. Here's the potential value of the credits. Here's the digestate side." We zeroed that, we didn't put value there in terms of monetary income. It wasn't a negative, but it wasn't a positive.

And we arrived at a rate, which they saw all these factors, both the ones that were certain and the ones that weren't. And we basically come into a rate of somewhere between the high 1s, 190-something to the 250 per household range. Which may not seem like much to you and I made this point yesterday, but if we went without a green

project like this to the city and said, "Yeah, it's just two bucks," we'd probably lose our franchise. I would quickly report back that our perfect record would be blemished, by the way.

So that's a big deal to get a $2 increase per household, but I think part of the strength was not only have most of the councils of those 50 cities seen our project and their public works directors and all the people that are involved in the decision-making machinery, they've all been to the facility. And they've been inspired by it, by the story.

And the fact, which I underscored yesterday, is that we have a long working relationship with these cities. So it would be very damaging to our reputation if there was a big gap between what we say we'll do and what we actually do, were to emerge. So we're not going to risk that reputation, sorry.

Now, having said that we haven't operated yet, so like everyone else I'm sure we're going to go through our hiccups. So I'm anxious to, I guess, find out what those are and get through that phase.

MR. WILLIAMS: One last question on the digestate is it sounds like you're working on developing evaluated fertilizer-type products and associated markets for that, but out of gate what's your plans for that material while

you're doing the market (indiscernible)

MR. RELIS: Well, we're going for compost, we have a couple of small facilities, and we may land-apply some. We have a specialist on our staff now who is dedicated to marketing of the digestate. But we're not producing product yet, that's the -- it's difficult to tell you exactly what we'll do without the parties seeing the product.

COMMISSIONER SCOTT: Okay. Sam?

MR. WADE: Thanks, Paul. So because you guys aren't operating yet I'm just curious about what sort of performance bonds you guys might've put on your contractors or technology in firms that you worked with, if any, because Harry touched on that.

MR. RELIS: You know we -- that's a good question. We don't really have -- we have contractual -- okay, let me step back. Isomet, (phonetic) a key part -- the core technology providers, a $1 billion company. So the performance guarantees are tied into the strength of that company. You can have a performance guarantee with a weak company and try and collect.

So both Eisenmann, which has a operational base in Chicago, in the U.S. for 10 or 15 years, we chose them, because they're essentially a pretty high-tech company. The AD Division of the company is a subset of codings.

They produce a lot of the equipment for the auto industry in terms of spray paint, that robotic type stuff. So they have heft as far as their balance sheet.

So I don't think we have a performance bond per se, but we have performance standards that both they and Greenlane must meet. And if they don't we have recourse through the company, that's our basic performance bond, functional equivalent I guess.

MR. WADE: And you hit on how you sort of soloed the fuel price stability aspect of this type of fuel and I think that's something we'd like to emphasize in LCFS as well when we talk about these sorts of projects. And I'm just wondering, you know, how valuable was that perceived?

MR. RELIS: I think it was less valuable than the Green Fleet. I think if you're looking at city councils and elected officials what do they want to deliver? They want to be able to deliver a quality of life and that's more important, as my perception in the selling of the project, than the fuel stability. Especially at a time when fuel rates are low, so it's kind of like wow, great story.

MR. WADE: Right, I was wondering if that switched at all as you saw the decline of oil prices. If suddenly you stopped talking about it as much or --

MR. RELIS: Well, I'd have to go to Mike Silva

who's our front -- or we have three people in the company that are marketing the project. I'm not involved in that now, I was in the early days.

MR. WADE: Okay. And the last thing was just to encourage you folks to come in and talk to us directly to get your own CI score in the near future. And (indiscernible) talking about these types of projects, so...

MR. RELIS: Oh, okay. And do you know Cynthia?

MR. WADE: Uh-huh.

MR. RELIS: Yeah, okay. Well, she'll be the one.

MR. WADE: Okay. Thanks.

MR. KAFFKA: Hi, Paul. As always a great presentation and I just want to say, for the sake of the record in my opinion, that there's sometimes criticism about how government works. But I think that the CEC can be proud of its process here of having identified and supported these kinds of projects, which are all very admirable --

COMMISSIONER SCOTT: Thank you.

MR. KAFFKA: -- and I think are very optimistic.

Paul, one of the things that -- I had a chance to visit this project a few months ago and it was really very impressive to see. I'm very interested in feedstock issues, so your feedstocks are largely green waste as I

understand?

MR. RELIS: Green and food, but initially primarily green. I mean, with the green can food portion.

MR. KAFFKA: Yeah, just anecdotally in my neighborhood, I haven't had a lawn for 20 years, which (indiscernible) but I'm noticing that most of my neighbors are kind of following this example this year. So some of that yard waste generation may change --

MR. RELIS: It'll probably crash.

MR. KAFFKA: -- in the future and I suppose that all of the waste-handling companies have thought about this. Is that a critical problem for you potentially or have (indiscernible) --

MR. RELIS: Well, it's a really important question. And it's one that until this year we really didn't have to raise, you know? So it shows again, I guess all of us deal with a dynamic world.

So what happens, I mean you could say worst case everybody's lawn goes away in California permanently. Well, we're not ready to quite go there, so we might have to scale back on Phase 4 maybe if that were really -- if we don't get any rain this winter or next -- I don't even know how to answer that question. We're all going to be scratching heads about everything, you know?

But on the assumption that this is we're entering

a different phase where lawns may not be as prevalent, then that's a factor on our feedstock. So we're obviously mindful of that. We're measuring the drop. So far it hasn't been very large. I can't tell you the exact tonnage drop, but I have that question to our team. Yes, it's important.

MR. KAFFKA: Is source-separated food waste part of your calculations?

MR. RELIS: Absolutely, we're really -- the reason we started with the residential mix of mostly green with food is that that infrastructure is already in place. The going out to get the commercial food, that's the next phase on your 1826. That's a more expensive infrastructure. Right now we don't have to alter the infrastructure at all, so that was the entry point. And Eisenmann had experience with bringing in comminute. So that's partly what sold us on their system.

MR. KAFFKA: Yeah. Well, I guess the last question, you can have a very substantial amount of digestate, and Perris is a great location, you know, but it's far from any large area where you might land application. In other words you'd have to go over the mountains to Coachella Valley or someplace like that.

So to what degree do you see upgraded products being potentially a part of your future and maybe even

necessary for your success?

MR. RELIS: Well, I think personally when I was a board member of the Waste Board composting was my focus. Evan knows that, I mean we worked on a lot of things together. And I think that this is where you come in, and the UC system. And I think we've got to take this to a quality level. That we haven't seen the energy focused on that market development side, I think take this to fertilizer.

How to do that's beyond my capability, but we've had a lot of internal talks. And like Evan we're spending a lot of money on the cleanup. Even though we call it source separated anyone knows, who's familiar with source separated, people still toss a lot of stuff in there that shouldn't be there. And that's going to be an ongoing educational issue, but we know that unless we start with the highest quality we can get to -- and we're putting a million dollars just on that green sorting line -- then our prospects of achieving the long-term high market are limited.

So we want to get to the organic market and we think, based on our talks with OMRI -- is it OMRI?

MR. EDGAR: It's TFA. (phonetic)

MR. RELIS: Is as long as the feedstock is source separated and is queen in size, we should be able to get

there. And that would be a nice niche to be able to achieve, but I think this is definitely going to be a work in progress, this market side. And I think it's all hands on deck for that phase.

MS. DRENNAN: I echo Stephen's comment in commending the CEC on the quality and diversity of projects that we've seen today. And I also commend the project teams on the execution thereof. I'm very much impressed.

I do have a couple of questions about your system with Eisenmann. How large are their systems in Europe?

MR. RELIS: Well, all I know are that most are agricultural scale. The exact tonnage, I'll get back to you with their whole range. I'll give you the whole gamut.

MS. DRENNAN: Thank you. That would be interesting.

MR. RELIS: But I can't answer that.

MS. DRENNAN: That's okay.

MR. RELIS: I know that we're the largest.

MS. DRENNAN: Yeah, that's what I figured. It seems that many of these unit operations are actually modular, which lends themselves to the distributability. And I'm a huge advocate of that. So I was wondering apart from the one that Stephen already identified with the digestate, what are the other potential disadvantages or barriers that you're going to come up with in the future?

MR. RELIS: Meaning what?

MS. DRENNAN: So the very large scale that you're at, are there any other foreseeable barriers or challenges?

MR. RELIS: Well, barriers? I suppose with green waste limits, we would not be able to achieve the build out that we thought. It would limit somewhat the production levels we're proposing. But on the other hand, I know we're working with the City of Los Angeles and they're looking very much forward to seeing how we perform, because they like to build a complex or a series. They have 800,000 tons a year of green waste separate from the food.

And so you're looking at scale, definitely. That would be almost three times our four-phase project scale. So we hope in the course of demonstrating our performance that this will be a demonstration of a large urban scale system even though many of the cities we serve are, like Evan's, they're smaller cities.

I don't know if that answers your question.

MS. DRENNAN: No, it does. Thank you for the insights and I wish all of you very much success. Thank you.

COMMISSIONER SCOTT: Thank you, so very much.

So I just want to remind folks, we're about to turn to the public comment if you'd like to make a comment. Thank you. Please, be sure to fill out a blue card and get

over to Tim, so that I'll know that you're there. We have about six folks.

I just wanted to do a quick summary. Summary's too strong of a word, but just some key things that I heard. And I think I heard at least two of you, but maybe all five of you say, as we went along -- and one of the things that we highlighted was the importance of state programs whether those were the incentives or the LCFS and thinking about the best forums for those, thinking about the best ways to implement those in order to continue to grow this industry.

We talked about -- and I'm kind of jumping around -- the importance of having a cushion when you think about the budget, because especially when we're at the beginning phases of these. So these might not be the very first project, but they may be number two or number three, but you need a little bit of a cushion in your budget to make sure that you can continue to go forward. And that we get the projects across the finish line and actually up and running and producing the fuel, which is where we all want to be.

We heard that experience in the industry really matters if you want to have a strong project team.

We talked a little bit about the difficulty of gaining access to the grid or to the pipeline for these

projects.

We highlighted that there are places where we would prefer to be the second or the third in the industry and not the first person. We talked about wanting to be proactive in this space, and working in partnerships, proactive in working with the cities, proactive in working with farmers, proactive in working with your neighbors and the neighborhoods that you're in as we're working on these projects.

We talked about working in a dynamic world. And Harry mentioned this in his project and Stephen and Paul talked about it a little bit. And we talked about oh gosh, there's the drought and now there's not as much yard waste as we might've anticipated coming in. And just being able to be -- I don't know or nimble or flexible is quite the right way -- but able to move as circumstances in the world change a little bit.

And then I will just wrap up the summary with something that Paul said in his remarks, which is this story is cool. This is a cool story and it's good for us to tell and to be able to bring forward.

And so with that, I want to say thank you to our Energy Commission staff, who work really hard each day on these biofuels and biogas projects. I want to thank all of you, Harry and Susan and Evan and Paul and Tom for putting

your projects under the microscope here for us today, so that we all have a chance to learn how we can continue to successfully move the industry forward. So I appreciate the time that you took to come here and to do that. And to be under the microscope a little bit today.

And I want to say thank you also to our reviewers, to Clark and to Sam and to Stephen and to Corinne for taking the time to really dig into the details of these projects. And bring forward your thoughtful questions to our project developers today. I think it's really -- your insights here and expertise are really helpful and very important for us.

I would look forward to gaining additional information through our comment process. And so that goes up on the board. We'll put it up again. I know that there might be a lot of detail, if there is please feel free to put it in writing and submit it to our docket.

And before I turn to the public comments that I have here in my hand, I just want to say thank you again, so much to Tim Olson for putting this together. I mean, this has been fantastic and we could not have done it without his leadership. So thank you so much, Tim.

(Applause.)

COMMISSIONER SCOTT: Okay. And with that I think we're going to go with the three-minute public comment

limit, just because I have quite a few and I want to try to keep -- in case folks have flights and things that they need to make -- I want to try to stay close to time.

So I have first, Paul Gruber from ITS Davis. And if you would come up to the microphone that's right here in the middle that'd be great.

And following Paul will be Julia Levin.

MR. GRUBER: Okay. Thanks, Janea. Thanks, guest speakers and reviewers.

A quick comment first, so yesterday's workshop's been mentioned a number of times and most everybody in the room, I think, either intended or was invited. But perhaps folks in the room and a few on WebEx were in the dark about that, so I just want it to be clear.

This was a project that's sponsored by the CEC, UC Davis is leading it. Oh, by the way I'm Paul Gruber, Executive Director of the STEPS Program at the Institute of Transportation Studies at UC Davis. So my team and I lead this project. We're charged by the Commissioner to host stakeholder workshops to look at emerging technologies and commercialization barriers to those technologies in the alternative fuel and vehicle space.

So if you have interest and you are a stakeholder engaged in emerging technology commercialization and development I encourage you to reach out to me. And at the

risk of receiving lots of emails, it's a risk I'm willing to take. So just Google me, Paul Gruber at UC Davis, I think you'll find me fairly rapidly and I can submit my email to the official record if needed.

And the next workshops we'll be hosting are on medium and heavy-duty conversion technologies and ZEVs. So that could be of interest to folks here in the room and online.

And then my question, it's a fairly open one. I'm going to -- you know, with the time permitted I'm just going to sort of submit it and see if we have responses here today. So I'm very fascinated by Harry's comments and Steve Kaffka and others addressed this on the productiveness, the performance of the ARFTVP program dollars.

So my question is -- and this is for CEC colleagues and the guest speakers and reviewers -- where does the ARFVTP funding for bio energy projects fit in the overall landscape of funding within the State from the ARB and from private entities and other pots of money? And is there an opportunity really for CEC to adjust its mission in use of ARFVTP dollars? Is there a receptiveness to that? Is the CEC open to it and is it feasible to adjust, to ensure that you are getting the best bang for your buck for those dollars?

And I will admit Steve addressed this. The Advisory Committee is debating this issue quite a lot, so my question is, is it feasible? Do you have room to adapt and to change the mission somewhat?

COMMISSIONER SCOTT: Sure and I think that in brief answer to that question, we are always thinking through how best to spend the dollars that Legislature has allocated to us with the Alternative Renewable Fuel and Vehicle Technology Program.

The Legislature, you know, has also directed us to put into a broad portfolio of projects. And that's why you see kind of the broad spread that the program typically has. But as you identified the Advisory Committee as a great place to engage with us as we continue forward on that discussion. I think we will --. the next meeting of it will be in early November. And it will, of course, be publicly noticed like all of our meetings are.

So let's go next to Julia Levin. And after Julia is David Rubenstein.

MS. LEVIN: So thank you, Commissioner. And thank you to the staff. I think this is absolutely a model program. It's fantastic that you take a portfolio-based approach instead of picking technology winners and losers. And I think it's great to see the Air Board and CalRecycle here and the interagency effort, which is so critical to

maximize the benefits of this program.

And I too want to thank staff who are unusually accessible and thoughtful and really constructive in making this program as important as it has been. And I think will continue to be.

Having said that, no good deed goes unpunished, a couple of recommendations actually more for the Air Board and CalRecycle, but I really do want to thank you for showing up. Having said that, Sam, for the Air Board I think the elephant in room is Cap and Trade funding. This is a hugely important program. I think the Energy Commission, with your help, your agency's help, is maximizing the benefits. But it's chump change compared to the Greenhouse Gas Reduction Funds.

And if we really want to meet the goals of low-carbon fuel standard -- and if we really want to provide a lot of benefit to disadvantaged communities -- we have to put some of the GGRF low-carbon transportation funding into lowest carbon transportation, which is what these guys are producing. That's critical.

Second, at the workshop yesterday a very common theme was the need for more long-term certainty. And while I think some people meant that on a regulatory side I would say it's even more important on the contract side. And speaking just for biogas, 99.9 percent of the biogas that

is used in California, that's produced and used in California, is used for electricity. And there's really only one reason who it's all going to electricity, virtually all and that is because they are 10, 15 and 20-year contracts under the RPS.

We need to provide comparable long-term certainty and market guarantees on the transportation side to put biogas to what is certainly a higher and better use in terms of greenhouse gas and air pollution reduction. So that's something that I really hope the LCFS program going forward has, because I'm not going to knock on wood. I'm confident and certain it's going to move forward and we're all going to give it that push next week.

Clark, I also have two kind of similar recommendations for CalRecycle. And again, I'm confident we're going to get you lots of money, hopefully lots more than you got this year. I think yours is one of the most important and quantifiable programs under the GGRF to divert organic waste away from landfills.

But two quick recommendations, the first similarly to be technology neutral -- there's no reason to limit the funding to anaerobic digestion. A large part of the organic waste going to landfills meets other conversion technologies like gasification and pyrolysis.

But the second part is you're required to

maximize greenhouse gas reductions and other benefits. And you can do that much more by not choosing between energy and compost, but funding projects that do both. Like Paul's, like Evan's, South San Francisco, sorry. We should look into projects that can do both and any bioenergy project can do both, because they're going to produce either digestate or biosolids or biochar that then become the organic soil. And that's the way to truly maximize greenhouse gas reduction.

So I thank you all. This is just such a positive accomplishment on behalf of the State. So thank you.

COMMISSIONER SCOTT: Thank you very much, Julia.

And I was remiss in thanking Paul also and UC Davis and NextSTEPS for their partnership on working on this.

David Rubenstein, and then Evan Williams.

MR. RUBENSTEIN: I thank you very much, Commissioner Scott, CEC staff, panel attendees. My comments are centered on our company, to use as an example, because I'm sure there's other companies like ours that are going through the same development processes that some of my comments will help too.

So in our case, what we're trying to do is sugarcane and sweet sorghum to ethanol here in California. We're bringing a reliable crop to the Imperial Valley.

It's sustainable, it's profitable to the farmers. We have addressed the water issues, so that comes up every single day. Commercial scale project, 66 million gallons a year of extremely low-carbon ethanol, we think it's sub-20.

We've already worked out with Lifecycle Associates, 50 megawatts of renewable electricity, 36 going to the grid baseload. And up to a billion cubic feet of anaerobic digestion biogas, which would make us one of the largest in the state. Not to mention 300 new jobs in Imperial County, which has an extremely high unemployment rate. We signed long-term agreements with Shell, 15 years for ethanol, 10 years on the biogas and electricity.

The funding? All friends and family, no venture capital, so we have a lot of friends and a lot of family that are running out of money and we still have a bridge to cross to get us to the financial close of this. And to do that we signed one of Wall Street's largest and best known investment banking firms who's ready to raise almost a half a billion dollars to get this project off the ground. With the caveat being that there's certain things that we need to do to get them to move that forward.

Some of those are going to be a Lender's Council, credit ratings, independent engineers, third-party reports. It's all of this that adds up for us to get there is to land a bondable EPC contractor that we've been talking

about, who we're working with, to be able to get in our position.

So what we ask the Energy Commission to do is maybe not put money in towards cellulosic ethanol and things like that. Let Department of Energy work on those big ticket items and help small guys like us move commercial viable projects like this forward, cover that last bridge of funding that we need to be able to leverage your couple million dollars into a half a billion dollar investment here in the state.

So what we're looking to do here is kind of reverse situations. We're bringing in technology from Brazil and bringing it into California versus good engineering and processing companies in California moving to Texas. So this is a good reverse growth for what we're trying to do.

And again, running out of time, so I'm going to skip this, this, this and technology risk. But what you're doing is bringing necessary funds and you're bridging the gap and economic benefits to the region. And so thank you.

COMMISSIONER SCOTT: Thank you, very much. And if you have them written down please be sure to send them to us and to our docket, so we'll get all of the information you have for us.

MR. RUBENSTEIN: I will, thank you.

COMMISSIONER SCOTT: Okay, terrific.

Oh, and if you think about it, and you have a minute, you know, either now or at the end of the hearing -- all of the public commenters -- our workshop reporter would love you forever, I think, if you handed her a business card, so she gets your name right in the record.

So I have Evan Williams is next followed by Amy Schwab*

MR. WILLIAMS: Thank you, Commissioner Scott. I actually have some commentary that was (indiscernible), but I can maybe get your comments and also Steve. And it had to do with a lot of what you've heard before. I subscribe to what Julia talked about, so I won't report it.

But I learned a couple things, how do we leverage the limited funds that the Energy Commission has and also limited staff. And I have some questions about that. Steve had talked about the need not to abandon (indiscernible) technologies, you know starter technologies.

And I think Harry -- and I'm probably a little more in Harry's camp -- talked about at the end of the day, success has to do with can you commercialize this, which means do the technologies work, do you have companies that at the end of the day stand and make projects work?

I observe that all of the companies that are up

here today, either have -- Paul's company, a 50 years; Susan's 100 years; Harry's been in the business for a number of years; Tom I can't say how long, but you've been in existence. So you have existing businesses that are here for your merit review.

The question is can we go ahead and maybe access people that are in the business and doing commercial investments? Which would include private equity people, for instance, for more advanced technologies that could add both in terms of matching capital to what CEC has as well as maybe the venture capital community to deal with the early-stage technologies.

Now, this isn't going to work for everybody, because I'm pretty sure that the companies that are here today are not going to put their hand up saying they want outside investment. But there may be smaller companies that have good technologies that do need that and that would be true both on the venture side and others.

A suggestion just, I think, in terms of I think a lot of things that Harry said, you have to have capital base. And if you have a smaller company, a private equity fund or a venture fund that was there could take care of the hiccups that happen. One thing I know for sure when you see projections, they will be wrong. The degree that they're wrong is the issue of do you have the capital to

(indiscernible) on those hiccups.

So I'm maybe a little bit early, but I thought that was something that occurred to me when Harry was talking -- and Steve raised some of these questions earlier -- that we might be able to leverage the funds that are available right now for these purposes. Thank you.

COMMISSIONER SCOTT: Thank you. I think as part of the discussion yesterday as well, Tim reached out to some banks to have part of the conversation that you raised. And unfortunately, they weren't able to make it. And don't feel obligated to, but if you'd like to make a remark Steve or Harry, please do.

Go ahead, Stephen.

MR. KAFFKA: You know, I think Harry had a very thoughtful presentation and your comments are very appropriate. I mean, there if you make requirements for certain levels of capitalization and certain project experience, basically you're limiting the creativity or at least the openness of innovation that the program can support.

And I think it appears that there is some space between what venture capital could support and what the needs are for early stage development concepts and ideas. It may be in California's interest and government's interest to create a special fund that both is a bit more

risk accepting. And also a bit less rigid in terms of ho funds are actually spent in the process.

You know, I mean sometimes state contracts are fairly specified. Ones we've had, we had to predict our travel budgets three years in advance. And yet we didn't know where we're going to be in three years, but you have to do that to meet the requirements of the contract. So there needs to be some (indiscernible) on the contract execution side.

And why would that be valuable? Well, David Rubenstein just mentioned -- and Julia is also a strong advocate of this motion -- if we're going to transfer the benefits of our AB 32 Program to all citizens of the state, the ones that mostly are bypassed are the ones that live in poor, rural areas in disadvantaged communities.

So in particular, that kind of flexibility might lend itself to startups where biomass feedstocks are generated in these rural areas, which lead to better employment and public well-being. And that value is, I think in my personal view, at least as important as greenhouse gas reduction.

COMMISSIONER SCOTT: Okay. Let's go to Amy Schwab and after her is Kevin Miller

MS. SCHWAB: Hi, Amy Schwab. And I am with the National Renewable Energy Lab. And I have the great luck to

work with the Department of Energy's Bioenergy Technologies Office. Lead what we call the Systems Integration Group, where we help them with their long-range planning, their systems (indiscernible) analysis and their performance monitoring across the program.

So it's really fascinating to be here. I thank you all for allowing me to be here. And I commend the California Energy Commission on pushing these technologies into execution. It is absolutely delightful to see what's happening here.

I just want to amplify a point, some points that Harry made about what goes into pushing these projects through to success. And I think the panel of projects that we have seen this morning are across the board exemplify just those lessons of what it takes to make this work. It very much parallels what the Department of Energy has seen and what my team at NREL has seen with what is going on across the country.

So I noticed a comment that Harry made yesterday about one of early projects falling apart, and I'm not sure that's true, because you're here. But I will also say that for the early stage projects, most of them fail forward and it requires a lot of support and tenacity to get through those and to learn from those lessons that inevitably come from the hopeful optimism of starting something as really

important as we're working on, but also as incredibly complex as we're working on.

So, you know, it's nice to see California leading the way and supporting this and keeping it pushed forward. And continuing to support moving into the future where we all need to go.

COMMISSIONER SCOTT: Thank you. I have Kevin Miller next followed by Jim Boyd.

MR. MILLER: Good afternoon. I'm Kevin Miller from the City of Napa. I think Evan mentioned our project a couple of times and we're fortunate to get $3 million of CEC grant funding towards our project that we're working feverishly on right now. And I thought I could share a couple of real world processes of crises that we're going through right now may be instructive to the Board.

One there was the idea of a tip fee as a revenue offset. And that's true, but as I think Evan and certainly Paul would tell you, the enemy of recycling and composting has always been cheap landfilling. And in our case, to be able to get it in the $60 range as a tip fee offset when our landfill transportation cost currently is $64 a ton, that's fantastic. Because once you get to that breaking point you already have that sum cost in your rate structure.

And for all the benefits that we know about, and

I don't need to belabor them, to shift from a loser technology of landfilling to the winner technology and all the environmental benefits -- and I want to say Paul, I think the one slide you had with the energy recovery nutrient value -- that is the telling one right there, 100 percent, on all those benefits. That's why it's such a cool package and that's why we get elected officials to support higher costs.

And I did want to emphasize that we would not go forward without the $3 million for our project. As beneficial as it was, we did the best we could on a cost benefit analysis that would look over a 20-year period. And our council approved a 1 percent rate increase more than they would've needed to before, but realize that's 1 percent for the next 20 plus years more than they would have needed it before. But they did that, because of all the attributes of this process.

And we want to thank South San Francisco too, because we're going to benefit from these real world experiences that they have for our project.

And then the other side is I want you to be aware too that this isn't -- there's a lot being asked of the local solid waste and recycling systems to get to 75 percent plus recycling, which is the CalRecycle goal.

It was mentioned clean material; we're trying to

be as clean as possible both the front end and the back end. We're putting $2.3 million in a pre-processing system. And we're going to have to put another $2 million into stormwater upgrades. Those are real dollars that have to be addressed.

And also the new regulations that have come out, 1/2 of 1 percent at the back end for compost. Well, that's 10 pounds in ton. We're going to have to work real hard to achieve those. I think I've run out of time here. Thank you.

COMMISSIONER SCOTT: All right, thank you.

MR. EDGAR: Yeah, one of the big things we did this year, Kevin, was the (indiscernible) Oroville, 1045. That really integrates the Water Board with the Air Board, because what's happened to the compost industry we're under attack from all sides. And your real world, all the compost -- we've spent millions of dollars on upgrading the water system.

So that's another reason why that grant money was so critical, because you've got to take the digestate compost and those upgrades from the Air and Water Board is going to be tremendous over the next couple years. So that's real world.

MR. MILLER: I know the last sentence I had mentioned, we do have the advantage that addresses a

concern earlier is our digestate will be composted and processed right onsite. So we don't have that transportation negative

COMMISSIONER SCOTT: Thank you.

I have Jim Boyd followed by Shawn Garvey. And I've only got -- after Shawn, I have Michael, and that's all the blue cards that I have in the room. So if you were wanting to make a comment please make sure you get a blue card in right quick.

Go ahead, Jim.

MR. BOYD: Thank you, Commissioner. I want to congratulate you for this symposium or hearing today. It's been very educational for me. It's shows how you've moved things along since I retired from this Commission. I'm not used to being on this side of the (indiscernible) either.

COMMISSIONER SCOTT: Do you want to come and join us up here?

MR. BOYD: So a commendation to my former advisor, Tim Olson, for your thanks, for what he's done. He picked up some of my passion for waste energy, biomass use and what have you, since I left the Commission.

I just want to say it's gratifying to see this, because I'm the one who broke the personal their personal pick on getting the AB 118 Program put in place. And you have no idea of the price we paid politically behind the

scenes to get the Energy Commission to get most of the money, that was originally intended to be all of the money to the Commission for this program.

I like the interagency cooperation I hear more talk about, it's absolutely necessary. You're dealing with a monstrous system with hundreds of dots to connect. And I think (indiscernible) you see more and more of how that fits. And you can't do something in just the narrow transportation area without thinking about the electricity area or the composting area or the recycling area.

And I want to say I'm pleased to see that compost folks and recycling folks are so tuned in now, because honestly early on if we tried to interject any of the material going to landfill for other uses, we were beat up severely over in the Legislature by the composters and recycles, because they thought it might mess up the program they'd spent so long of their lives to get. But now everybody's working cooperatively, which is what we really need and just need a lot more of it.

I think Harry mentioned, you know, really the question why the State spends this money to get into here. Well, it was my experience particularly during the recession or depression, that the venture capitalists backpedaled really fast. The key financers seeing the venture capitalists running from the Valley of Death,

seeing no one stepping in, they just walked from the scene. And if government doesn't walk a little ways into the valley -- and not with a lot of money, but with its reputation on the line to bring the big bankers back into the picture -- I don't think we'd be talking about what we have here today.

But I think this is an incredibly important program. Interagency cooperation, you need to -- the PUC, you talked to a lot, but they need to be involved. The interconnection problem that is referenced has been very problematic. The PUC has a role to play, they're not the fastest agency in the world and the utilities were very uncooperative in past. And that's got to be caught up.

CPIP, Tom didn't mention the real grief that was paid by both the players and this agency, in getting that performance-based program launched in the middle of the recession when the food versus fuel hysteria was raging. And this agency paid a huge price. They just said one seven-year program lasted a year and that's basically what it was.

And the ARB in the state (indiscernible) low carbon energy ethanol wasn't any place you could get it, and thank god it survived for a year. But it really should've lasted longer. The Treasurer's Office paid a little bit of a price too, but comparatively anyway --

remember on that point.

You know, this agency when I worked here, we signed an MOU with the country of Sweden. It might've been on the same trip that Paul was --

MR. KOEHLER: Well, it was different.

MR. BOYD: Okay. But there were multiple trips to Sweden, because they were so far advanced and remained so far advanced. And California -- and the energy in their area was so far advanced we wanted to exchange things. But most of those kind of cooperative MOUs just kind of go in a drawer somewhere unfortunately, are not policed very well.

And I would encourage you to pay attention to what Sweden has done, because ten years ago they were already separating in the homes, all of their waste. And they were biodigesting fuel like crazy.

So my message yesterday was to get the policy people in the Legislature and the Executive Branch to embrace and speak more favorably about what you're trying to do in this small slice of the pie that's so big in all that we're really doing these days to try and solve other problems. That this could help if they only realized it, quantify it, monetize it and pay for what you're trying to do.

And ditto Commissioner Levin's comments about Cap and Trade dollars, ARB. Sam, I don't know you, you're one

of the new millennials running agencies that are now considered a -- I learned recently I'm part of the silver tsunami.

And lastly, the CI, it was referenced a little bit here today. It's very confusing to the folks who are beginning to be more active in this area. They don't understand it. I talked a little bit -- I finally read your website -- it is confusing. And people don't know when to jump in to go after a CI. People are asking what's the CI of their potential product, if they can only get their process done. And, "Well, I don't have a CI yet, because I don't think I can get one, because I really am not generating the product yet." Some education is needed. Thanks.

COMMISSIONER SCOTT: Thank you, Jim. Thank you for your (indiscernible) --

MR. WADE: Thanks, Jim. I could just go on to the CI part of it. I mean, I think we're aware of this issue. I mean, initially the program was more geared toward large biofuel producers who had the time and money to come and talk to us and develop their own CIs. And we're making an attempt to simplify it for smaller producers.

So, you know, I encourage folks to reach out directly to myself and other LCFS staff. And just, you

know, have a conversation about the range of CIs that we've already established and the representative ones that's closest to your technology and situation. And that should be good enough to start you down path of financial modeling.

And then as you get into operations and you have a quarter's worth of real world data, that's really when it's time to come to us and get your individual CI. So hopefully that clears things up.

COMMISSIONER SCOTT: Thank you.

We have next Shawn Garvey followed by Michael Paparian

MR. GARVEY: Thank you, Commissioner Scott. Shawn Garvey with the Grant Farm and I'll quickly go through some comments. I had some of these prepared and I'll be submitting them in writing as well.

COMMISSIONER SCOTT: Thank you.

MR. GARVEY: But so many great observations this morning, much of the discussion today was focused on what constitutes success from the perspective of CEC investment in a project or a technology. My comments today are more about the people and processes that support project success for bioenergy projects.

In our experience at the Grant Farm, projects really succeed or fail strictly on the strength of the

technology or the project. But rather the strength, integrity, patience and diligence of the key people involved in the project. Harry's projects at Crimson, Evan's projects, Paul's projects succeed quite frankly, because of the unique qualities that Harry, Evan and Paul bring to their projects.

So I think we should just as carefully think about how we reproduce Harry, Evan, and Paul as we do how we reproduce biodiesel equipment and biodiesel projects.

A couple of thoughts about how we do that, first is to expand upon the culture of innovation. Steven and Harry both raised the issue of the separation of venture funding and more high-risk funding. The EISG Program used to be that vehicle.

Right now on the EPIC side, they have an RFP on the street for $33 million, which captures -- frankly builds upon substantially, the strengths of the strengths of the EISG Program.

And by having a Series A and Series B funding round for EPIC-type projects of $150,000 and $450,000 mimicking more what we see in accelerators and clusters and incubators around the state.

I think that certainly this side of the building, of the agency, might want to seriously consider adding on. I know that's how EISG built out as well, but that's a

place to deposit. The great thing about the way they're handling that, as well as that is being managed, it will be managed outside the agency. So through a foundation or through an accelerator program that has the skill sets to identify the difference between success and failure for those types of key people who are involved in a project.

I'd like point out number two, the avoidance of catastrophic success. This is a concept that we have built in, hardwired, at the Grant Farm now. A lot of the original projects that we worked four or five or six years, seven, eight, nine years ago ended up experiencing what we define as catastrophic success.

We use this in our proposals, so I'll read it to you. "An innovation enterprise that attracts so many resources so quickly, that it exceeds its own sustaining capacity resulting in the inability of the organization to respond to demand." We can all point to several projects funded by the CEC that have experienced catastrophic success. And there are some ways, I think, that it's worth spending time on the distinction between a project that experiences this and then one that doesn't.

Having been through may kickoff meetings and CPURs I can tell you that basic information about how an applicant, a successful applicant works with the CEC, is very well communicated, fairly standardized at this point.

But the qualities that are required of the team working with the agency is not a part of the conversation.

And I want us to build out an understanding of how the CEC actually works with and collaborates with its funding partners, so as to better ensure their own success. So socializing applicants and awardees to the very idea of how to collaborate with the agency, support teaming ((phonetic) relations, the teaming mentorship programs for people who have been funded in the past, so that they could be led through the process. And you could diminish that sort of antagonism that occurs between many of your funded applicants and the agency.

I mean, it's not always felt to be, on the outside, a mutually rewarding collaborative experience. People oftentimes are feeling like they're defending themselves from the agency, right or wrong.

COMMISSIONER SCOTT: Yeah. Shawn, I'll ask you to give us a summary remark and then thank you for writing it all down and sending it to us as well.

MR. GARVEY: I will absolutely submit this in summary, and I apologize for the time.

COMMISSIONER SCOTT: No, no, it's all good.

MR. GARVEY: Matt told me it would take longer than three minutes.

But just to finish up, streamline and modernize

the process. This stuff has to go online. The timelines of the projects need to be held to by the agency as well as the applicants. I would consider mimicking CalRecycle's GHG Organics Program, not only in the process of submission in relationship to prospective applicants, but also in the way that they have incentivized production, fast production, in the grant process itself. So that part of the grant is going as a grant and part of it is a reward for production in the timeline that you've committed to.

And finally I do need to say this, just for the record, we have to dramatically expand the communities that are participating in California's advanced energy economy. Quite simply this entire concept, this historic transformative thing that we're all part of is absolutely unsustainable. I know we know this and you and I have talked about it. If the audience that we're talking to today, and in this room, as great as -- and forward thinking as everybody here is -- doesn't dramatically expand it.

And so we need investment in bringing new communities that are not part of this conversation into this conversation. Thank you.

COMMISSIONER SCOTT: Yep, thank you very much.

I have Michael Paparian and that's my last blue card, so if there's anyone here who wanted to make a remark

and hasn't put in a card please maybe line up behind Mike.

But go ahead, Mike.

MR. PAPARIAN: Thank you. I just wanted to offer a caution and an opportunity in the area of venture capital. When I ran the Pollution Control Financing Authority we received $84 million in federal funds to assist businesses. It could be used for one of four categories, venture capital was one. Very, very (indiscernible) -- we could have jumped into venture capital, we looked at it very carefully decided not to do it.

And the reason we decided not to do was we basically decided the State is not very good at venture capital-type programs, particularly in light of there being the most robust venture capital community in the world, in California. It's kind of like if you had trouble getting technical evaluators lined up to assist you. You can imagine how challenging it would be to get kind of the financial folks, who would really make the right decisions on venture capital, (indiscernible) the State when there are others that are going to make a ton of money off of that.

So my suggestions are three-fold. I think you could influence the venture capital community by working to make projects more visible to the venture capital

community, looking for opportunities to make projects more desirable for the venture capital community. And I think some of the things that you've talked about here would actually do that.

And then finally, it may be possible to partner up with some folks. I'm thinking particularly of the group called CALCEF, who is in kind of a quasi-venture capital space, but is not really a venture capital company, it's more of a nonprofit that was set up and sanctioned by the State of California.

COMMISSIONER SCOTT: Great, thank you.

Anyone else in the room? Okay. My understanding is that we do not have any comment on the WebEx; is that still the case?

(Response off mic.)

Okay. Well, thank you so very much to everyone for your engaged participation. We really appreciate it. I mean, help me thank our panelists and our reviewers.

(Applause.)

COMMISSIONER SCOTT: Tim, any closing remarks?

MR. OLSON: So the only thing, if you want to make a public comment. We don't have a deadline, but it would be great if you could provide that in next couple of weeks. And the materials -- there'll be a transcript of this workshop and the materials, the presentations are on

our website right now.

COMMISSIONER SCOTT: Excellent. We are adjourned.

(Whereupon, at 12:57 p.m., the workshop was adjourned)

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