COMMITTEE WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

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| In the Matter of: | ) | |
| | ) | |
| Preparation of the 2007 | ) | Docket No. |
| Integrated Energy Policy | ) | 06-IEP-1C |
| Report (2007 IEPR) | ) | |
| | ) | |
| and | ) | |
| | ) | |
| Implementation of Renewables | ) | Docket No. |
| Portfolio Standard Legislation | ) | 03-RPS-1078 |
| _____ | ) | |

CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

MONDAY, MAY 21, 2007

9:30 A.M.

Reported by:
Peter Petty
Contract No. 150-04-002

COMMISSIONERS PRESENT

Jackalyne Pfannenstiel, Presiding Member

John Geesman, Associate Member

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Melissa Jones

Suzanne Korosec

Tim Tutt

STAFF and CONTRACTORS PRESENT

Pamela Doughman

Bill Knox

ALSO PRESENT

Hans Cleijne, KEMA, Inc. (KEMA)

Wilson Rickerson, Center for Sustainable Energy (CSE)

Jonathan Lesser, PhD, Bates White (via telephone)

Paul Gipe, Wind-Works.org

Frank DeRosa, Pacific Gas & Electric Company

Stuart Hemphill, Southern California Edison

Lad Lorenz, San Diego Gas & Electric

Steven Kelly, Independent Energy Producers

John O'Donnell, Ausra, Inc.

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Jane Turnbull, California League of Women Voters

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# I N D E X

P R O C E E D I N G S

9:34 a.m.

PRESIDING MEMBER PFANNENSTIEL: This is an Energy Commission workshop in the Integrated Energy Policy Report Committee and today we are going to address the issue of feed-in tariffs.

I am Jackie Pfannenstiel, I am the Presiding Commissioner on the Integrated Energy Policy Report Committee. To my right is Commissioner John Geesman who is the assigned other commissioner on that committee. To my left is Tim Tutt, my staff advisor, and to Commissioner Geesman's right is, who is here today, Suzanne Korosec, his advisor.

With no further adieu why don't we get started.

MR. KNOX: Good morning and thank you all for coming to the workshop on feed-in tariffs for renewable energy.

Just a few housekeeping things first. For people not familiar with this building there are restrooms located right in the corner over there to the west. There is a snack bar on the second floor where you can get coffee or snacks. And lastly in case, if there were an emergency and

the building had to be evacuated please follow employees to the appropriate exits. People would be reconvening at Roosevelt Park, which is diagonally across the street in that direction.

The workshop today, I'll let you know a little bit about the structure of the workshop. We are going to have four presentations first. Following the presentations we're anticipating a break for lunch and then a panel discussion and then following the panel discussion there will be a period for public comment.

Our first presenter today is Hans Cleijne from KEMA. And I think he gets the prize for coming the furthest, all the way from the Netherlands today. So Hans, take it away. Thank you.

MR. CLEIJNE: Thank you. Thank you for having me here. I was asked to talk about feed-in systems and best practices and lessons learned in Europe. And I'd like to tell you a little bit --

UNIDENTIFIED SPEAKER: Your microphone?

MR. CLEIJNE: Is this better? Okay. It's still okay? Okay.

Actually three questions. What is a feed-in tariff and what are experiences in Europe.

And I want to refer to three countries, Germany and Spain known for their successful feed-in systems, and the Netherlands because I know best about that. And then I want to try to answer the question, what lessons can be learned from those experiences.

Maybe a little bit introduction of myself. I work for KEMA in the Netherlands and KEMA is assigned by the government together with ECN, the energy research center, to determine the feed-in premiums in the Netherlands. So we advise the government on the levels of feed-in tariffs in the Netherlands.

And we also help them with the system design. We are currently going through a new, we're innovating the system now and within the next two months or so we will have, we will give them advice on how the system would look like for the future.

And further I have also participated in European studies on harmonization of renewable electricity systems, which is referred to as RES-E. That is European Committee jargon for renewable electricity as opposed to RES-H for heat and RES-F for fuel.

So what is a feed-in tariff? A feed-in tariff is actually a system where you look at the investments, the cost of renewable energy systems, and get that to a tariff, which is needed to make that generation option profitable.

Starting from the left, and all the blue boxes are inputs, it includes investments, operation and maintenance costs, finance costs, land lease, tax, profits. And in case you talk about biofuels it also includes fuel costs. From that you can calculate what the annual cash flows are together with a reference production figure. So that's the energy output of such a plant. You come to a levelized cost.

Once you have that then you have a choice. A number of countries have chosen for feed-in tariff and then the levelized cost is directly changed into a feed-in tariff. A number of other countries choose to have a feed-in premium which deducts the electricity price from the levelized costs.

There is one exception to that, at least in the case of the Netherlands where we have also biomass co-fired electricity plants. And there we don't look at the electricity price as a

substitute but we look at the replaced fuel costs. So in case you burn wood in a co-fired plant then the cost of the co- would be say the reference level for the feed-in premium.

Now this seems pretty straightforward. I'll say the procedure is straightforward but in a sense it's also not because most of the feed-in tariffs are there for 10 to 15 years and they have, they are also more or less fixed. That means that some of the costs, the investment costs are costs that you invest today. But for instance if you look at fuel costs or land lease or electricity prices it is pretty hard to predict those for 15 years ahead. If I would know how to do that then I probably wouldn't be standing here.

So that's really, in all the systems that's an issue. How can you predict or forecast those kinds of fuel prices or electricity prices. And what we'll see in the coming, in the next slides is that most of the countries are fighting with that problem.

A second thing is that there is also the issue of how to get to the information. The market is always far ahead of say the government in knowing what the levels of these costs are

because they are making them themselves and either the advisers or the government have to know what the investments or the O&M costs are. So that's all of the information, lack of information for advisor of governments is an issue that will be there.

Coming to the systems. In Europe actually there are four different systems. Feed-in tariffs, which are here depicted in blue; quota or certificate systems which are red; feed-in tariffs and quota, which is a mixed system which is only there in Italy; and in Finland they have tax incentives and investment grants.

If you look, 17 out of 25 countries are now having a feed-in system, of which a number of them have a feed-in premium systems and a number of them have feed-in tariffs.

Known countries for having feed-in tariffs, so not a premium on top of the wholesale electricity market are Germany, France and Ireland. From the back of my mind I'd say a very big country having a premium system is, for instance Spain. And also in the Netherlands we have a premium system. I'll come to that.

In almost all cases there is a

differentiated tariff for different options, different renewable energy techniques. I have mentioned them here: Biomass, both stand-alone and co-fired. And in these technologies you also have a different of different fuels. So biomass a actually very difficult one to get around if you want to set a feed-in tariff. Solar, hydro, wave and tidal, waste incineration and wind energy, both offshore and onshore.

Why do you want to have different categories? Similar options are collected in separate and for each of these categories you can have sort of a generic feed-in tariff or premiums. And as I said that depends on the type of technology and the type of fuels.

The reason for that is that you want to keep those, you want to have the technologies and the price levels and the movements in the markets, say the way for instance investments decease in time. You want to keep them in one hand. And that's the reason that similar options are collected in separate categories.

But once you have done that then you have questions like, how many categories are acceptable or necessary? For instance, it is not

very practical to have a single category for every single renewable option. In terms of administration it's quite a burden. On the other hand sometimes it is necessary.

The second question is, are any reference projects available? You can imagine that new emerging technologies -- For instance offshore wind projects are now emerging. One of the questions that we have to set a feed-in tariff for, for offshore technologies. But that is quite difficult for a technology that isn't there yet. Then you refer to countries abroad, you refer to technologies.

Then it turns out -- Let's say for instance they are at a different depth or they are further from the shore, et cetera, et cetera. So you have to find a way to set your feed-in tariffs and to set the inputs for that. So it's a question, are there sufficient reference projects available?

The same question is how to handle emerging categories or how to stimulate new technology? One of the issues is that say that in the Netherlands there is a maximum tariff for feed-in tariffs, which is 10 dollar cents per

kilowatt hour, 13 dollar cents per kilowatt hour. And that excludes, for instance, things like solar. So if you want to have solar, or at least to stimulate solar to become a mature technology in the future you have to think of how you want to do that. So that's why there is a question how to stimulate new technology.

So I've set -- Well there is a limit to the number of different tariffs that you can set. And that means that within a single category there are probably locations or situations where you have projects that will have high profits and also projects that have low profits.

And then a system which is called stepped feed-in tariffs might be of help. And I've picked one which is an example for wind energy. It's also probably the option where stepped feed-in tariffs are used most.

This is, for instance the German or the Dutch system where you have a base tariff for the length of the total period of support and you have a premium tariff which is there for a number of years which are dependant on the location.

So in cases you have a lot of wind you will have a short period of this premium tariff.

If you have less wind then you will have a longer period. And in this case in this way you can handle the different location situations.

This is the result of the Dutch system where you have -- it depends a little bit on the electricity price so it doesn't seem very spectacular here. But the lower line shows the generation costs. The upper line shows what happens if you don't have a stepped feed-in tariff. And if you have a stepped feed-in tariff which is dependant on the capacity factor then you will see that you can reduce some of the generator profits.

So lessons learned from that. The advantage of a stepped feed-in tariff is that you can handle local conditions or plant size or fuel type can be taken into account within the definition of a category. It is often also part of the legislation so that's more or less, that is quite rigid, it is not so easy to change, so a stepped feed-in tariff might help to set the rules.

A second advantage is that not only the sites with most favorable conditions can be exploited but also further inland. For instance

where you have low wind speeds. But for the best, most favorable sites the producer, the generator profit can be kept low. And for that reason also the burden on the electricity consumers is lower.

There are also some disadvantages. It can lead to high administrative complexity. That means that for instance in Germany for every single type of wind turbine there is defined a reference turbine and all locations are compared to that reference turbine. So for every turbine type you need a type certificate and then the subsidy system is dependant on that. There are also other ways to do that but one of the issues is that it can be quite complex.

It might also lead to all these different tariff levels and formulas and so it might also lead to less transparency. It is not so easy to tell somebody who is not familiar with the system what the level of your support is. And one of the examples that can be important is that we have put the 15 year period, which is the expected lifetime of the machines, back to a 10 year subsidy period. That means that roughly speaking all the subsidy levels are one and a half times higher and we always have to explain why we

give so much money to the generators. Also from a political point of view transparency is something that you would like to have. But also it might lead to some uncertainty for the investors.

Another issue is that it may induce strategic behavior. One example is large generators on wind turbines then you have a fixed rotor and you put a large generator in it. And then you can -- I won't get into the technical details but it means that you can change the design in order to get more subsidy. Well that's something that we've noticed over the years and it's also an issue which is quite a big debate in Europe.

Also which is maybe easier to understand is that if you have a 50 megawatt biomass plant and you get less subsidy for that plant than you get for 5 megawatt plants then you divide the plants in 10 times 5 megawatts. And it is very difficult to rule that completely out. This is also a type of strategic behavior that I wanted to describe.

Well then I come to, can we get, can we learn something from the specific experiences in the countries and I want to start with Germany.

Germany has -- all the targets are set within a European framework. and actually that's quite a big help. So that would compare I suppose to the federal level in the states, although the countries are more independent I suppose than the states in the US. But setting levels of required percentages in the European connection helps the countries because they can always say, okay, we have to abide by the Commission, the European Commission.

The EU target for Germany is 12.5 percent from electricity in 2010 and 20 percent in 2020. Already installed is 10 percent in 2005 so that's two years ago, of which 35 percent is hydro. And there is a big difference in the countries that have hydro or that don't have hydro. Forty-five percent wind power, 40 percent biomass and 6 percent solar.

Especially if you look at -- and that's also one of the reasons that everybody says that the feed-in tariff is very successful. There has been strong development in wind power, 20 gigawatts in 2006, which is 30 percent of global capacity and which also makes Germany the leading country in the world. And there are also very

high ambitions for solar, which has a feed-in tariff of about 50 Euro cents, which is what is it, 60 dollar cents per kilowatt hour.

The present feed-in tariff is based on the Renewable Energy Law, which is in place since 2004, and it will be reviewed every four years. It gives 20 years of support, and as I just explained, wind energy has a stepped feed-in tariff.

If you look at it Germany has been very successful in subsidizing and developing renewable electricity. What is also noticed is that long term subsidies, 20 years of subsidies, gives a lot of confidence both to investors and to banks. And what is noticed is that if you look at say the discount rates in Germany they are lower than in countries that have a certificate system. And that is because of the long terms, the long periods of subsidies.

There is by -- By law they have what is called a digression factor. Feed-in tariffs decrease every year by one percent by kilowatt hour. It can also be shown that that has led to decreasing costs, for instance, for wind energy.

From the regulatory aspects it is the

case of transmission system operators, and I understand that this is not a term which is completely known in the US but let's say the operator of the electricity system. They are obliged to absorb all the electricity from renewable energy sources. And that means that in terms of balancing and in terms of electricity programs the renewable electricity is separated from the power market and the transmission system operators are responsible for managing the unbalance, for instance, caused by wind electricity.

And that is something which is now emerging which might become a problem is that what they have done is most of the wind generation is in the north of Germany and people are complaining. People in the north are complaining because they have also part of the electricity system and the tariffs in the north were higher.

And then they said okay, in order to solve that we will just from a point of the electricity programs just act like the electricity is also generated in the south. Which is not actually the case but we will just put that burden on to the utilities as well.

And what is now happening is that because you think there is electricity generated by wind in the south you have to generate less fossil in the south and you get transmission from the north to the south.

And because it's a connected system that also happens between -- part of the electricity goes through Belgium and France and part of it goes through Poland and Chechnya and those people start to complain. One of the reasons is that it limits the possibilities for trading. So you see that the regulatory or political solution for a problem that didn't exist now causes physical problems in the system.

Coming to the lessons for Germany it can be seen that feed-in tariffs are very successful in a starting market. That in the long run maybe integration, full integration with the power market will be a necessity. That regulation may have an effect on the functioning of the electricity system. Well this is a very general statement but it refers to the point I just made.

For that reason if you talk to stakeholders right now feed-in tariffs were beyond discussion in Germany. What you see is that now

there are discussion starting on reviewing the possibility of having a feed-in premium and maybe coupled to a power market index, a power market price index.

And coming to Spain it shows that the target is much higher, 29.4. But that also reflects the possibilities of Spain for having renewable electricity.

Well they realized 15 percent in 2005 of which most was hydro, 40 percent was wind power and 15 percent was biomass.

And also there has been a strong development in wind, 12,000 megawatts, and there is a potential for 20 gigawatts.

The present feed-in system is based on the electricity bill from 1997 and also there they have a review period of four years.

The special thing about Spain is that generators have the choice between the option of having a feed-in tariff, so a fixed tariff, or a feed-in premium on top of the wholesale price. It is not something that is set by the government but generators can choose that by themselves. I will just -- In a minute I will show that 90 percent of the wind farm owners have switched to the premium

option over the last years.

The special thing about Spain is that they have based their feed-in tariff on the average electricity tariff and the average electricity tariff is the average cost of electricity of all produced electricity in Spain divided by -- the total cost divided by the total number of kilowatt hours and the transmission cost.

The subsidy is for the lifetime of the plant and there is no feed-in tariff so every generator gets the same tariff for his produced kilowatt hours.

As I said, there's two different options, either a fixed tariff, 80 to 90 of the average electricity tariff for wind and biomass, up to 575 percent for solar. And there's two other fees, one for reactive power and one is for security of supply.

On the other hand there is the premium tariff which is 30 to 40 percent of the electricity tariff. And there is also a premium for market participation in the incentive of ten percent. A capacity credit, and again, the fees for reactive power and security of supply.

If we look at the blue line it shows that in a period of one and a half year 90 percent of the wind generators switched from the feed-in tariff to the feed-in premium. So why is that? Probably that's because they can make more money from the premium system.

And that's exactly what happened in Spain. We have seen that they have been very successful in stimulating new developments. But if you look at the feed-in premium coupled to an average electricity tariff there is something at hand. The electricity tariff is also a tariff which is used for the consumer market. And in order to protect the consumers the increase in the electricity tariff was allowed to be no more than two percent per year.

In 2004 and 2005 the spot market prices were increased much faster than two percent per year so that's exactly the reason why everybody changed to the feed-in premium. The premium was set by correlating it with the tariff, which was allowed to increase only by two percent. The spot market price increased much faster, 40 or 50 percent, so with this fixed premium and a very much higher spot market price the wind turbine

owners could make much more money in the spot market.

And that led to two problems. On the one hand it led to a loss in the consumer power market. If I am correct they have now a loss of about 3.8 billion euros or dollars, which is a problem on the one hand, but on the other hand it's also over-subsidizing wind.

So they have now been changing. They changed the rules and it probably leads to a system where the percentage given as a premium will be flexible. So it will be defined by the government every year. Still it is dependant on the electricity price. It is a percentage of the electricity price.

The lesson we can learn from this in my opinion is that if you choose a feed-in premium then you really should use the correct reference for the electricity price. If you set the wrong reference then you will have deviations between the tariff or the premium and the wholesale electricity price and that will lead to either over-stimulating, over-subsidizing, which is something that probably governments don't want, or to under-subsidizing, and then there will be no

development of new technology or new generation.

Coming to the Netherlands. We have a target of nine percent renewable electricity in 2010, with 60 percent of that as biomass mainly co-firing, 30 percent is wind power. And we have a present feed-in premium system based on the electricity bill of 1998.

There is a maximum tariff of ten cents per kilowatt hour. These are euro cents, it's now 13 dollar cents per kilowatt hour. As I said the feed-in based on the generation costs minus the expected long term estimate of, again, long term electricity. And the electricity is sold to the electricity utilities and generators also charge for imbalance. So the difference between the electricity programs and the actual realized production.

Our government says that 2010 targets will be reached. And that is also the reason why they have now set the tariffs to zero. The point is that last year there were too many applicants and the system was open-ended. The funding was part of the government budget. Before that it was part of the energy bill of the consumer.

In 2005 it was moved because it was

about 50 euros per year and then it was expected to become 100. Which is not, which was something that politically -- we had elections in, when was it? You can imagine it wasn't really something that politicians want to say to the public, that this would have to be something like 100 euros or even more and then they put it on the general budget.

And then it became part of the budget system and over-spendings were reported so they decided because the targets for 2010 will be reached and because we have over-spending we don't need any new generation any more so we set the tariffs to zero. One of the reasons is --

And that's also why I referred to emerging technologies. Suddenly we had this co-firing and co=firing tariff but nobody had thought of people co-firing palm oil in gas-fired stations. Which adds, the oil prices, the palm oil prices at that moment and the high gas prices was very profitable. That cost about 50 million per year. So something that nobody had expected.

We had been writing reports a year before that and saying, well it's not profitable to burn palm oil in gas-fired stations and then

suddenly we noticed from the figures that everybody was doing it. So yeah, the market has always more information than the advisors.

I've already explained that say increasing electricity prices in the wholesale markets led to over-subsidizing of generation, of renewable energy generation, and for that reason there is now a new legislation in preparation which will probably include a number of things. There will be a limited budget which will be coupled to the target of renewable electricity.

The budget may be moved again away from the general budget again and put into the kilowatt hour price. Probably the premium will become dependant on the spot market price and not be demandant on a long term estimate of the electricity price. Which means that the risk for over-subsidizing will be decreased but on the other hand it is also something that the government is taking over the risk of electricity volatility.

And that is something that the budget also must have the possibility to breath with the electricity price, which is something which is not easily done. At least not within our government

but I think that could be a problem in any government's budget. And we probably have a modification of the stepped feed-in tariff because it still does not take away all the over-subsidizing of very good wind locations.

So coming to best practice and recommendations. The first one clearly reflects that you should allocate sufficient budgets in order to meet your long-term targets. Because what happened in our country is this switching on and off of subsidies is really something that is really decreasing the confidence with generators very hard.

Technology specific tariffs levels can limit the costs and over-subsidizing. Stepped feed-in tariffs can help to vary the subsidies within single technologies. Premium systems are very sensitive to variations in the electricity price. And in order to be able to cope with that you have to be very careful in what kind of reference price you choose to base your feed-in premiums on.

From Germany we have learned that interaction with the electricity system should be studied very carefully because what you don't want

is that your subsidy system is causing physical problems in the grid. That is also something that comes from the German case is that you can induce learning effects by decreasing tariffs gradually and by, say, pushing people into the right direction.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you very much. I just have a couple of very short clarifying questions. I know we want to wait until the end to get into discussion. But just so that I understand. You said that Netherlands expects to meet the goals, the 2010 goals and therefore could drop the tariff to zero. Yet you're now looking at a new tariff so I assume they're either future goals or you don't really expect to meet the 2010 goals. Which is it?

MR. CLEIJNE: Both.

PRESIDING MEMBER PFANNENSTIEL: Okay. Had the future goals been set?

MR. CLEIJNE: The goals for 2020 have just been set but I don't know if they are already agreed upon. This is a negotiation between the Dutch government and the European Union and that is always a very delicate process.

The thing with the 2010 goals is that they are based on, or you're seen that they're based on quite a high amount of co-firing. Well there is one difficulty with co-firing compared to, for instance, wind energy. Once you build a wind turbine you can expect it will produce electricity for 15 or 20 years.

But if you look at co-firing it is more or less a put option. You can always decide not to fire any biomass in your plant. So because the government has given away the put option they don't know exactly what will happen. And this is especially the case because last year --

The tariffs for co-firing were set for ten years in the beginning and then it was decided to fix the fuel rates for three years because nobody can really know what the fuels will be in ten years time.

So there was a moment in time after three years that the government could say okay, we review the fuel price and then we set another level of the price. That was done last year and that has led to quite a substantial lower input of, of biomass.

And the second thing is that palm oil is

now very much on the discussion as a fuel, as a biofuel because of the effects it has on tropical woods and so on. So effectively the utilities that started that, that were actually co-firing palm oil have now stopped. That's quite a big hole in the, in the amount that we have.

PRESIDING MEMBER PFANNENSTIEL: I see, thank you.

ASSOCIATE MEMBER GEESMAN: For some time we've read of the renewable goals established by the European Union but actual implementation appears to be the primary responsibility of the sovereign members.. As the European electricity market becomes more integrated over time would it be reasonable to expect some of these renewable incentives to be either harmonized among member states or perhaps union-wide tariffs?

MR. CLEIJNE: I was at the wind energy conference in Milan last week, the European wind energy conference, and there was a workshop on harmonization and integration of subsidies. I think the general conclusion was that as the electricity market is still not harmonized at all, and there may be 27 different electricity markets, it is not likely that it will be harmonized in the

short run.

On the other hand there are movements in the electricity markets. There is at least regional development or regional harmonization in the electricity markets and -- It has been discussed quite a number of times, is it something that we want to achieve, a harmonized market. And I think the general conclusion is it is not something that we can expect over the next seven or eight years at least.

ASSOCIATE MEMBER GEESMAN: Thank you.

MR. KNOX: Thank you very much, Hans.

Our next speaker is Wilson Rickerson from the Center for Sustainable Energy. And he is going to be speaking about what California can learn from European feed-in tariffs. Wilson.

MR. RICKERSON: Good morning and thanks a lot for inviting me out to speak. I'm very happy to be here. I was -- I am actually in from Boston and I was fascinated to find that you all have something here called, the sun, which I am looking forward to telling everyone back home about.

I actually started my career in Germany studying feed-in tariffs and came back to the

United States in May 2001 very naively excited about we're going to roll out, you know, this great new policy. I found out that we hadn't really, it wasn't really talked about much over on this side of the Atlantic.

I then went to work in the state of Delaware on drafting their renewable portfolio standard, pretty much along the lines of how we first envisioned renewable portfolio standards in this country, kind of in a deregulated market based on short-term tradable RECs with an alternative compliance payment, so on and so forth.

And since then we've seen RPS kind of spread across the country in many different permutations using a lot of different mechanisms. To the point that now it's hard to say where one mechanism, what mechanisms still actually mean RPS and what don't. I think it's kind of opened up the doors to think about different mechanisms to meet targets, much as the Europeans say.

Every European country has a certain percentage by a certain year target, and the mechanisms they use to get there are very different and varied. That's what we're going to

talk about.

So this is -- I think a lot of times what we talk about with Germany in particular is the megawatts and gigawatts of capacity they have installed with both their wind and also their PV. But, you know, that leads to questions about, well, are they erecting a lot of sculpture that doesn't really do much of anything, it just sits there?

But you have to remember the feed-in tariffs are actually performance based. So this graph is what I think we're actually chasing when we talk about chasing Germany. And this is the share of their electricity they get from renewable energy resources every year. I'm not actually sure where my figure went, the numbers used to lie in the graph, but they start on this side at about 2,000, I believe, and advance for about 5 percent in just a few years up to 12.5 percent in a relatively windless and cloudy country.

ASSOCIATE MEMBER GEESMAN: And that is actual electricity generated?

MR. RICKERSON: This is a percentage of their electricity portfolio. So 12.5 percent by 2010 is their goal. On the far right of the graph

there is actually, it's 2006. By 2006 they had gotten to 12 percent. So almost to their goal about four years early. And over here on the far left hand side was, I believe it's 2000 they were back around six percent.

ASSOCIATE MEMBER GEESMAN: And that's actual generation?

MR. RICKERSON: Actual generation, actual output, not capacity.

ASSOCIATE MEMBER GEESMAN: See, here in California some people prefer to count contracts signed.

MR. RICKERSON: This is actually share being fed into the grid, which the utilities have to, have to track because -- I mean, the transmission system has to track anyway because they get together and say, this is our average generation across all the utilities, the renewables we're purchasing. They turn around to the distribution utilities and say, you have to buy this average at this price from us. So they have to know how much their portfolio is every year.

And this explosive growth has led, even the Merkel government, which is conservative

compared to the previous Red-Green Alliance we had in power over in Germany, saying that they are on track to continue to back down the nuclear plants. That they were planning to back down. They announced a nuclear moratorium a few years ago.

So I guess the reason that so much attention is being paid to this particular model in Europe anyway is because of the real changes they are making to their portfolio.

And again a very similar slide to the one that Hans just showed. We added Romania and Bulgaria I guess last year and they each added one to the RPS and feed-in team apiece so it didn't really change the balance there too much. But as you can see the European policy has converged, as Hans pointed out, around feed-in tariffs and around what they call the quota or the tradable green certificate system. Which is, again, more similar to our original concept of RPS that we talked about in '96, '97 based on short-term REC markets.

And the map used to look a little different in 2000. It used to be feed-in tariffs versus options and quotas based on systems of tendering. And the quotas were generally driven

from the field as the UK, Ireland and France switched over to other systems. Now the debate is between RPS and feed-in tariffs. It's interesting that there is even this pattern of convergence around these two central themes. The reason for that is because --

You brought up harmonization earlier. In 2001 the European Union said, not only should every country adopt a renewable energy target, a certain percentage by a certain year, go forth and figure out your mechanisms. But in 2005 we're actually going to compare them all and see which ones have actually performed, which ones are actually the best, and then we're going to try to harmonize our renewable energy policies across the European Union.

So this led to this convergence and kind of this knock-down, drag-out, zero-sum game. Well we kind of tend to debate over here to have or have not a renewable energy policy. They tend to debate over there which one is actually best. So they've actually -- there are a lot of interesting lessons from the European debate.

The conclusions may not apply directly to us but it's interesting a lot of the lessons

coming out of there because they have had a much more rigorous inter-policy debate than we have over here between specifically feed-ins and RPS as they defined it. The results were pretty academic, pretty rigorous but also pretty messy and as a result they haven't moved forward with harmonization as of yet and it's still, you know, an ongoing and very interesting dialogue.

The arguments for feed-in tariffs that kind of came out. There's a whole litany of them that came from academics and governments and industry associations. I'm not going to run through them all. Just to point out that some of these have empirically played out, for example, manufacturing and jobs, rapid deployment, meeting targets and goals and so on and so forth. You can basically check the numbers and say, yes that's happened.

Some of the things like geographic distribution may not have played out exactly. Maybe feed-in tariffs, it's kind of come to light that they may not just inherently build DG markets over utility scale markets. It all depends, again, on how you design them.

There is also some question about --

there was an argument that feed-in tariffs are more appropriate for fuel-free renewable energy resources like wind and solar power because it takes the focus away from price-based competition for a fuel for a resource and puts them on the equipment market where all the investment is up front. I think it is still a very compelling argument. I haven't seen anything since as to how that actually is playing out. I was looking through one of the upcoming presentations and I think someone else is saying the exact opposite is happening. I'm not sure, we'll see.

But the actual big meat of the argument has been on efficiency. The Europeans define that in terms of two types of efficiency. One is dynamic efficiency. First of all static efficiency, which is how are we encouraging cost decreases right now in the present. How much bang for our buck are we getting right now, And the other one is, how much bang for our buck are we going to get in the future, which is what they call dynamic efficiency.

And an international team came together and said, by separating these technology bands for, you know, wind and solar, with emerging

resources and present resources, that that in the long run is going to drive emerging resources down their cost curves quicker and ultimately that is going to make feed-in tariffs cheaper societally than RPS laws that don't have technology bands.

That's a pretty interesting study but I think the biggest -- that's more forecasting and looking down the road. What they found empirically, which I think is pretty interesting, is on static efficiency comparing RPS laws based on renewable energy credit markets, what is happening right now and how they are creating competition, versus how feed-in tariffs are acting efficiently. They have come to the conclusion that feed-in tariffs have actually been, have been more efficient recently. That's important to remember these are, they're comparing short RPS policies based on short-term REC markets.

Just to unpack this slide a little bit. This is actually the study that the European Commission put out in 2005 once they evaluated everyone's policies like they said they would in 2001. This is just for wind generation. And the countries along the bottom, Belgium, Italy, Sweden and the UK that have red squares around them have

short-term REC markets.

And the red dots are the payments that generators are actually getting and the blue lines are what the European Commission concluded are what the generators actually needed. So what you can see here is that a lot of times in these RPS based on short-term REC markets you had generators effectually windfall profits. The credit prices were trading well above where they needed to be.

You can't really jump from this to the American experience for a lot of reasons which I won't get into now. But I think the main reason, one of the main reasons for this slide was that these higher costs for the RPS can be found in the higher risk premiums requested by investors, the administrative costs and the immature green certificate market.

The main focus there being on the higher risk premium requested by investors because you are going to be financing projects based on a volatile, you know, 20 year stream of credits that could shift and have shifted. If you look at East Coast RPS markets they have been all over the place. So putting your money on those versus putting your money on a 20 year contract, it's a

lot more secure.

That led Nicholas Stern who was from the Stern Review on the Economics of Climate Change, a big study done for the UK commissioned by the UK. Nicholas Stern used to be the chief economist at the World Bank. He concluded I guess in his voluminous report that feed-ins actually achieve larger deployment at lower costs.

So what does that mean for us? It's easy to kind of get wrapped up in the feed-in, you know, less filling/tastes great feed-in tariff versus RPS debate. But in actuality it's hard to apply that kind of back and forth to the United States. Simply because if you look at the way RPS has evolved since 1996, '97 we do have a cluster of short-term REC markets in deregulated states on the East Coast.

We've got some with voluntary markets, some with long-term contracts and RECs. New York has, you know, centrally managed, centrally procured RPS. California is set up very different as well. So it's hard to say that feed-ins are inherently superior from RPS because it's actually even hard to say what RPS means anymore.

I think ultimately it gets down to

having a target, having a goal to diversify our portfolio and figuring out the mechanisms to get there. And both here and in Europe we have seen the policy design, the regulatory framework, the market context, the actual electrical infrastructure like how your transmission system is actually set up, and your renewable energy resources actually drive results.

With that disclaimer aside I think there are still some best practices that we can find by looking across policies. And what the European market means for California, also kind of comparing more specifically, is there really isn't any need to have these titanic battles saying, do we take this instead of that.

First of all we don't have pressure for harmonization over here in the US. There is no need to say we've got to pick one or the other and then we're going to harmonize. We also have record of setting up -- we had a debate in the '90s between public benefits to RPS or to public benefit fund. You know, similar to the European debate to RPS or the feed-in tariff. And we ultimately just learned that we can combine them both and use them to support different resources,

different ends of the product cycle.

There is also no short-term REC markets here so -- there are a lot of arguments back and forth about the comparative merits compared to the strengths of the California RPS but there are long-term investor horizons at least instead of just a volatile market of short-term RECs, you know, down the road.

Also there is the debate about things like technology. I'm sorry, the dynamic efficiency, and how is this going to drive emerging resources. Through things like CSI we actually are targeting emerging resources here. Maybe just using different -- not all under the same mechanism, maybe under different ones as soon as we sort out the time of use.

So Rob in saying, the Europeans say this about RPS, therefore RPS is bad, therefore what we're doing here is bad. I'd say, just toss that all at the door. Instead maybe say, you know, instead of worrying about the weakness of RPS what are some of the strengths of feed-in tariffs. How can that provide a model both to California and elsewhere.

This is obviously not definitive. This

is kind of a few thinking points that I pulled out of the IEPR report. You know, could a feed-in tariff help with some of the things that IEPR talked about as being some of the concerns of the current RPS.

Going all the way to the bottom, transmission constraints. I think one of the utilities commented that feed-in tariffs are not going to help with transmission constraints. That's right. You know, you've got a different set of policies to ultimately deal with that.

With repowering you can probably design a feed-in tariff to target repowering. Actually I just talked to a friend of mine this morning over in Germany who all she does is repowering feed-in tariffs. And she said that their repowering efforts have been slower under feed-in tariffs than they first thought. Maybe only ten percent of new wind capacity has been coming from repowering. Well it was early in 2000 I remember seeing these huge spikes in capacity projected for their repowering efforts.

Going back up to the top again. RPS not being at pace to reach the 2010 or 2020 goals. You know, we've seen very, very explosive growth

because it's been open-ended, not necessarily goal-constrained in European countries.

With regards to investor uncertainty regarding the SEP and whether it's financeable. Kind of take that out of the question by having a set 20 year contract.

With lack of transparency and simplicity I think it's a scale, a spectrum. You know certainly as Hans was saying it's tough, it's complex to go through the process of figuring out each reference turbine and kind of getting under the hood and saying, what is the generation cost of this generator and what do they need to be profitable. But then again that is probably less complex than some of the other things that we have been trying around the United States.

And maybe going through that -- Ultimately, for example, going back to the example of East Coast RPS. Both setting a reference price for a feed-in tariff and setting an RPS supply market of supply target. It's government intervening in the market in two different ways. On the feed-in tariff it's setting a price and letting the market determine quantity. And then in RPS, East Coast RPS it's setting a quantity and

letting the market determine the price.

And I think a lot of times we set our RPS goals by saying, 20 percent in 2020 is a great round number, let's go there. And that actually opens the door to market imbalances and crazy credit problems. I think maybe the complexity of walking through something like setting a reference price. Anyway, I'll get down off that soapbox.

Also MPR being based on uncertain natural gas forecasts. Again, it's a totally different perspective when you're basing things on generation costs that each generator needs rather than forecasting natural gas.

And lastly, inadequate consideration of contract failure. I guess kind of the difference between designing a policy for, you know, kind of reactive market growth, we need to hit this goal by this date and then see what happens next. Versus the open-ended model where contract failure is not really a problem, or at least in some markets because it has been so explosive. You know, if someone drops out someone else is going to pick up the slack.

But this shouldn't be just cheerleading about feed-in tariffs. I was asked to kind of

talk about some of the European strengths and weaknesses and how it fits in here. And there's a lot of work to be done and a lot of nuance and subtlety that needs to be worked through about how to design, how this could actually be implemented or, you know, concertized.

But before, you know, California starts thinking about feed-in tariffs, or I guess you're already thinking about feed-in tariffs, the one thing that may come up is, you know, the ghost of PURPA. You know, is this a return to PURPA, is this the wrong way to go? PURPA had some lessons and some people actually taught, you know, saying PURPA was the first feed-in tariff.

But I think a lot of people are pretty clear about where PURPA went wrong and the lessons from Europe over the past 15 years can be used to inform how to do it right. But only that, there were some cultural changes too and some market changes. Technology prices have come down as electricity prices have come back up. The simple fact that premium prices for renewable energy no longer equal, are equated for policy failure. We're seeing, you know, just by having carve-outs or PV in RPSs across the country. We're seeing

that people are willing to pay a price to get that to market.

Also an interesting thing that has been coming up recently is that fixed price contracts, if integrated into a portfolio in the right way can serve as portfolio hedges against price volatility. And I was talking to Bob Grace, a co-author on the paper I wrote. He said, you know, the California standard offer number four might not work, those prices might still have been high. But maybe in New York, which also caught a lot of fire for I think they are six year contracts or something, those contracts might still look pretty good these days. The prices sagged but then came back up again. It might not have been too terrible to hedge.

But also not only volatility hedges but we're going to see some other things like carbon regulation down the pipeline. There's other things we need to be thinking about hedging about.

In Europe instead of forecasting on an ever-increasing scale, you know, projecting prices to rise, you can design feed-in tariffs to be structured to decline over time. You can review them every couple of years to see how you're

doing. You can actually put a cap on them or limit them to DG. You can do things to it that maybe weren't on the table with PURPA.

And also another thing we've seen is that there has been a willingness, especially in California I think at the forefront, to explore fixed-price incentives again. We've seen, you know, talk about -- we're seen talk about feed-in tariffs now, obviously today in this workshop, but also during the CSI being settled on with the 100 kilowatts. SCE is now offering standard RPS contracts for biomass as of last week I think. And also the 300.2 wastewater treatment plant doorway as well.

So moving forward how do you take feed-in tariffs and implement them? There are a couple of different schools of thought about what points of entry could there be in the United States.

One could be, you know, a DG carve-out where we're seeing things in RPS for PV or community ownership or DG renewables or different things that aren't otherwise going to be able to play in the level playing field of all-in renewable energy competition.

And, you know, the very willingness of

policy makers to kind of start thinking about this sort of thing seems to say, well we want technology, we want to encourage technology-specific incentives. As you're taking that step to do technology-specific incentives you could also take the step to think about something like a feed-in tariff. That's one school of thought.

And in fact I guess as Paul will talk about it a little bit in Ontario, you know, the feed-in tariff there has been bounded by a ten megawatt cap. In other states we've seen people start talking about feed-in tariffs bounded by DG or PV or, you know, let's keep it small to avoid these problems that come with overpayment and large scale utility contracts.

Which take us to the next one. Beyond DG and community ownership another kind of scenario which gets into some of the problems that Hans was talking about with the risk of overpayment and power market integration and strategic gaming a bit more is kind of utility scale and beyond. We have started to see people think about utility scale, either through bilateral contracts in regulated states, in deregulated states they're either long-term REC

contracts or setting up long-term contracts to be contracts for differences.

As Hans was saying, the Dutch example with having a price, a feed-in tariff potentially be a price forward for RECs floating on top. Al Gore recently talked about the electranet and there have also been some other proposals for national feed-in tariffs. When you get to that level or when you get thinking much bigger about feed-in tariffs you have to start being more careful.

I mean clearly Germany is a country of 80 million people packed into a land mass four percent our size with a much denser transmission network and load centers more closely, you know, centered around where the resources are or aren't. If you were to have an open-ended feed-in tariff in North Dakota, for example, where would that all go in terms of the transmission. Who would it be serving. You just have a lot of wind sprouting up. So there are things that you need to balance when you start talking bigger and more ambitious. But no reason not to think bigger, more ambitious, at least conceptually.

So in addition to California thinking

about feed-in tariffs, or at least exploring them, there are some other states out there. Hawaii recently put a senate bill in for a solar feed-in tariff. Massachusetts just announced they are actively exploring a solar feed-in tariff. And I think Wisconsin is still actively exploring.

New Jersey, New York and Oregon have certainly been kicking it around and talking about it and explicitly acknowledging a link to the German experience to the extent they're actually following that now. I think they are maybe less, they are kind of somewhat backing off or putting it on the back burner to some degree.

But there is an interesting community of other policy makers out there that could talk about this sort of thing.

And finally, if I'm still within my time bounds here, conclusions are that many of the current arguments against or for feed-in tariffs have already played out in Europe over the past 15 years. Not that they have been conclusive or decisive but the fact they are a good model and a good place to go looking for how these different things have played out as California considers its own next steps.

Feed-in tariffs and RPS do not have to be at odds. Just because they have different titles doesn't mean they can't necessarily be almost the exact same policy when you really start messing with the design criteria.

California is pretty well-positioned to consider feed-in tariffs when you take into account its ambitious greenhouse gas goals, its solar planning and renewable energy targets. There is a history here of standard offer contracts and also long-term bilateral contracts are already in place here as a building block. A lot of the recommendations about how to refine the step payment from the IEPR seem to kind of take steps toward something that looked almost like a feed-in tariff, even if it wasn't called that.

But there's still a lot of critical design considerations to be overcome down the road. Obvious things like how do you set the price. There are a couple of different published methodologies out there. I'm sure Hans could talk for awhile about that.

How to build flexibility mechanisms in over time. The declining schedules, the review periods. What resources do you want to target?

Is it going to be big or is it going to be small? Policy interaction is something I didn't really talk about but the Europeans don't have net metering. They don't have separate policies, at least in Germany for DG and utility scale projects. You get a feed-in tariff and that's it.

Here, you know, if we get down below the utility scale we have to start figuring out how we're going to bundle RECs and net metering and incentives and rebates with what we've already got out there and how they all play well together. And different states so far that are using fixed price tariffs for different policy goals all have different ways of approaching that so it's kind of a mess. And lastly, obviously cost control options, which I think everyone here is pretty acutely aware of.

And that's it. Thank you again for inviting me out.

ASSOCIATE MEMBER GEESMAN: Wilson, thanks for being here today. Let me ask with respect to the EU member states that you think actually adopted and implemented feed-in tariffs successfully. In comparison to the regulatory structure both at the volume of resources

dedicated to regulation and the quality of the resulting regulatory framework, how does that compare to your view, subjective though it probably is, of the California regulatory proficiency?

MR. RICKERSON: I'll answer but I think I might be getting out on a limb that maybe Paul or somebody else might be better qualified to answer. But I seem to remember that in Germany, for example, they actually didn't have regulators and that has only been a recent introduction. Is that right, Paul?

MR. GIPE: Yes.

MR. RICKERSON: So the fact that we even have regulation here, not one but two regulatory bodies, we're already, you know, twice as good as they are. I don't mean to be flippant about it. I think they are, they are now realizing that look, especially since we're headed towards market liberalization we have to stop having our utilities raided by the EU. It's time to get some kind of regulation in here. I am actually not familiar about how Spain regulates or does not regulate.

PRESIDING MEMBER PFANNENSTIEL: Just one

kind of question that I have been pondering a bit. The EU member countries all have greenhouse gas goals and commitments and each one of them is focusing on the electric utility sector with certain targets.

Does it seem that the feed-in tariffs such that currently exist are quite compatible with the electric sector meeting these targets? Or perhaps even as I have heard suggested, maybe the feed-in tariffs aren't even necessary given those GHG targets. Or perhaps they are an essential part of it. How do you think about that?

MR. RICKERSON: I think it's a whole other can of worms. I think maybe Hans can maybe talk about that a bit better also. As far as I know they have kind of separated the electricity. They've kept those sides of the greenhouse separate with greenhouse gas emissions on one side and the electricity industry kind of separate being driven by the renewable electricity goals.

They don't really get into the problems that we're kind of anticipating on this side of how do greenhouse emissions tie into REC markets, are they aggregated, disaggregated, all that mess.

They actually don't even have really RECs over there to worry about in the first place. They kind of keep them separate.

I'm not really up on how well that is all playing out. For awhile I heard that -- I've seen news reports coming out of Germany saying our renewable electricity standards aren't moving fast enough to actually get to where we need to be with carbon. Now on the other hand I am now seeing things saying, we're going so fast we're going to be backing down our nuclear power and we're going to meet, we've got 27 percent by 2020 no problem. So I'm not sure where that all comes out in the wash.

ASSOCIATE MEMBER GEESMAN: Some of these countries, the differences between the environmental ministry and the energy ministry make our occasional dust-up with our sister commission look pale by comparison.

PRESIDING MEMBER PFANNENSTIEL: Thank you.

MR. RICKERSON: Thanks very much.

MR. KNOX: Thank you very much, Wilson.

We've got a break scheduled for now if people want to take about -- what do we want,

about ten minutes?

PRESIDING MEMBER PFANNENSTIEL: Sure, that sounds good.

MR. KNOX: Let's come back I guess right about 11. Thanks.

(Whereupon, a recess was taken off the record.)

MR. KNOX: Our next presenter is Jonathan Lesser of Bates White who will be giving a presentation put together by Spencer Yang, Xuejuan Su and Jonathan. And the title is Design of an Economically Efficient Feed-In Tariff.

So go ahead. Jonathan is going to be presenting remotely from the East Coast. Go ahead, Jonathan.

DR. LESSER: Thank you very much. I hope everyone can hear me now. If there is a problem just let me know, please.

We were asked to focus on what an efficient, economically efficient feed-in tariff design would look like. So again our thought was, we went through the purpose of the feed-in tariff if you're going to design one. It behooves one to understand what it's for.

We included in the presentation a review

of European FIT designs but since that's really been covered I think we'll probably skip that in the interest of time. I think we're going to go through some of the economic limitations of current feed-in tariff designs and talk more about the actual design of an efficient one. And what we're proposing is an auction-based capacity model, which I'm sure will raise some questions.

So in our view the purpose of feed-in tariffs is to encourage adoption of advanced renewable energy technologies. But it's really to accelerate development of mid- to long-term renewable technologies, not just the ones that are essentially in the market right now.

You want them to encourage greater technological innovation. You'd like them to be able to help accelerate cost reduction of technologies that are not currently economic at existing market prices. And obviously you want to provide financial stability and support for renewable developers.

The other kind of goals of feed-in tariffs are to promote specific energy policy goals such as reduced fossil fuel dependence, including decreased exposure to fossil fuel price

volatility. And also reductions in environmental degradation in terms of reducing criteria pollutants under the Clean Air Act and reductions in greenhouse gasses.

As I said I'm going to just skip over the European designs. But certainly if anybody has any questions about those slides let us know.

What are the limitations of the existing feed-in tariff design? Well, from an economist's standpoint all feed-in tariffs are subsidies. And subsidies can be very problematic because they can be, if not designed correctly, economically inefficient. And I think the previous speaker mentioned something about PURPA, which was in fact the first example of a feed-in tariff subsidy.

Under PURPA prices were based on -- that the tariff levels were based on forecasts of avoided costs, they were not market-based in any sense. Which meant that regulators had to guess future market conditions over the next few decades, which is clearly something none of us is very good at. Forecasts were typically wrong and sometimes they were wrong by very large margins.

The other problem of course with PURPA was that it really encouraged development of very

inefficient technologies, what were referred to as PURPA machines. And there were some examples of those under California SO4 contracts.

In general the problem with subsidies is that they insulate market participants from the rigors of the marketplace. What that means is that less efficient competitors an continue operating, which translates to higher costs to consumers. In this case that translates to higher electric costs to consumers, which means reduced overall competitiveness for California industry. It also means with subsidies less investment by more efficient competitors because the return that they can get will decrease.

So essentially even though you want those efficient competitors investing a lot to gain the most from them if you give -- if your subsidies are too large then they're going to be less likely to come into the market.

The other thing is that subsidies can often have very perverse economic consequences. Too high a price and you'll encourage rapid growth of very near-term technologies and technologies that are too speculative. Essentially lose the technologies in the middle, which is really what

you're targeting with feed-in tariffs.

The other problem is that you get technological setbacks. Essentially someone is being paid quite a lot to make it worthwhile for them to invest in a very speculative technology if it's set back that can reverberate throughout the market lowering expected returns, generating greater risk and raising financing costs. All things that you don't want to encourage with feed-in tariffs.

The other problem with current feed-in tariff design is that it still, they all still require regulators to forecast the future. So regulators must establish price curves for each technology. They have to forecast growth in technological improvement.

And that is in fact similar to -- for those of you in the audience who are familiar with performance-based regulation, essentially an RPI-X form of rate regulation where RPI is an inflation factor and X is a productivity factor. Well, certainly trying to accurately predict future productivity growth is probably impossible. And in the same way predicting the rate of technological improvement, that can be extremely

difficult.

There's also what we call an endogeneity problem in that the prices set by the regulators can affect technological improvement rates. And again as I mentioned before, you can have a perverse consequence where if the price is too high you can actually reduce the rate of technological improvement. And also the other issue is that the technology improvement rates for individual technologies can have spillover effects into other technologies because they will divert investment dollars to individual technologies.

So with that background we wanted to look at using tariff design how could you leverage economic incentive and market information to promote efficient, least-cost policies. Well in our views the first thing is you want to rely as much as market-based information. Basically renewable energy technology developers are going to have better information than any policy maker. They'll have a better understanding of the available technologies, what expected technological progress is and what the trends in overall cost of generation are.

Therefore what makes most sense to us is

to elicit information from the developers themselves through the market. That way you can minimize the use of long-term avoided cost forecast values by policy makers. You minimize the use of generation cost estimates so you'll avoid over- or under-compensation. And you also minimize estimates of how quickly technology will progress. So essentially the market-based approach is also going to reduce the administrative burden and provide greater accuracy and information. So it's really a win-win for policy makers.

The other benefit, of course, is that a market design really allows policy makers to focus more on their key objectives. They can focus on what are the types of technologies they want to receive the feed-in tariff subsidies. They can balance more mature renewable technologies versus incipient but promising renewable energy technologies over the long term.

They can also take a more detailed look at the time horizon for feed-in tariff subsidies. Those could be based on either a calendar year time or some sort of trigger condition so the regulators decide when the renewable energy

capacity shares reach a certain desired percentage of total supply.

And of course the time horizon has to balance financial stability with a known payment stream and economic efficiency to encourage economic operation and don't need to need to increase the price of electricity.

Now policy makers must still be aware of caveats about subsidies and unrealistic energy policy goals. For example, there are obviously -- However a feed-in tariff is designed there's going to be transmission interconnection issues with intermittent resources like wind. You have to consider the effect on retail electric rates and damage to economic competitiveness. And you've got to look at will there be reductions in technological progress as we sort of max out technology.

So in terms of design what you want to ensure is what we call installation efficiency and operating efficiency. For installation efficiency you really want installed capacity under a feed-in tariff to embody the current technology frontier. It makes no sense to subsidize outdated technologies for technologies that are already

market competitive. You also want to promote operating efficiency. So you want to make sure that whatever is the capacity you are installing really is going to produce energy at the lowest, possible cost.

In our view we think a two-part feed-in tariff provides a solution. Part one is a capacity payment and that would be determined through a capacity market auction just for the different types of renewables that are designed. And this is very similar to a forward capacity market design that has in fact been implemented by the CAISO and has already been implemented in New England and PJM. Essentially it promotes installation efficiency and provides financial stability to development.

The second part of the feed-in tariff would be an energy payment. And that energy payment would in fact be tied to actual generation and depend on whatever the spot market energy price was. Renewable developers would be receiving a competitive market price that would promote operating efficiency.

Why would this two-part feed-in tariff work? Well, competition is going to weed out less

efficient technologies as well as less efficient plants. So you're letting the market mechanism work while you're still attaining the policy goals of renewables that you want.

The capacity payment essentially using an auction approach. Auctions have been widely and successfully used in the public domain for electromagnetic spectrum, offshore drilling rights, timber and logging rights, highway construction, treasury bills, et cetera, et cetera.

What auctions would allow is that it would select the more cost efficient renewables producers without burdening policy makers to try to determine or divine actual costs for each renewable technology. Essentially the developers themselves would figure out what their costs are through the auction process.

Now in fact California used an auction process in 1998 to 2002 for supplemental energy payments to renewables developers. The difference with that was that auction did not guarantee the funds would be available in the future, which is a critical difference to our proposal. There is no way you can have an auction, in fact there is no

way you can have any sort of feed-in tariff if you say well, five years from now we may change our minds and all the payments we promised you will vanish.

In terms of the energy payment with the competitive spot market, it's going to encourage more energy production but it's going to avoid paying distorted prices. The more energy that is produced when the market is tight, at super-leak and peak periods, the higher will be the RET developers' energy payments. It will encourage them to make their generation available when it is most needed. So the competitive market will reward efficient renewable producers without requiring policy makers to monitor each producer's actions.

Let's go into a few more details about our proposed model. Again, what we are suggesting is to have it similar to a forward capacity market design currently in use by PJM, the ISO in New England and now proposed to the California ISO. Essentially how it will work is based on existing renewable energy capacity California policy makers would determine how much incremental capacity is needed to reach the goals they want to achieve in

future years. That would mean that the policy makers would establish technology-specific goals. So for example you might say that in 2008 you'll have an auction that will be designed to solicit capacity that will be on-line in the year 2010.

Interested parties participate in the auction, they use a selected auction format. Now there are many different auction designs that can be used, descending clock, the ascending clock, et cetera. All of the successful bidders, say you're having a solar auction. All the successful solar bidders will be paid a market clearing price for their capacity. Clearing prices can be determined where the bid capacity exactly meets the policy goals you've established for this individual renewable energy technology. And what is very important and which is also in a forward capacity market design is that successful bidders will be penalized if they do not brig their capacity on-line as required.

So here is an example with a 2008 solar auction and a 2010 on-line date. Essentially the policy makers would establish their goal of however many megawatts of solar generation they'd like to attain. This would all be in writing.

there would be a cutoff level, I show the dashed line on the figure. And so all the solar producers who bid at or below that amount would in fact receive that market price and you get the policy goal of however many megawatts of solar capacity produced.

Now to address technology. This would in fact happen automatically. And you can see that the capacity payments over time would decline. So for each -- As technology improved and the cost of generation decreased for a given technology then the market clearing option price is also going to decrease automatically. So in each year's auction you could see prices dropping for capacity due to cost savings from learning and technology. And those price reductions would occur without policy makers having to try to determine the appropriate pattern for the feed-in tariff prices. So you don't have to determine the technology curve, the market does it for you.

You'd also include an incentive mechanism. Clearly you don't want the capacity to be idle, you want it to produce as much energy as possible. So rather than an administrative energy price, again, the renewable providers sell energy

to the spot market or they can use bilateral agreements, the choice is up to them.

What we do is though modify the annual capacity payments in any year based on what their relative capacity factor, essentially how much energy they are producing each year relative to all the producers for that vintage technology.

And again here is a for example. You may have a specific solar developer who is very efficient. His solar technology in the 2008 auction beginning in 2010 is producing at a higher rate of output than other solar providers who also participated successfully in that auction. And so that provider would get essentially a capacity payment boost. This way you would enhance greater production of energy which is really what you want.

And again this is very similar to forward capacity market designs that are set up to encourage the availability of installed capacity during very high-demand peak energy hours. Of course the energy price provides an additional incentive to be generating power when it is most valuable.

So the auction would work in such a

manner that you would get an increase in the installed amount of capacity over time. And clearly the degree to which you want to increase the incremental capacity each year that you hold an auction is up to the policy makers.

And one think we were suggesting on the next page is that you're going to want the payment to expire after a selected number of years. So for example you might have a ten-year capacity payment stream. The first auction in 2008 with an on-line date of 2010. Payments would go from 2010 for the 2010 vintage through the year 2019. Payments for the 2011 vintage would go through 2020 and so forth. Obviously the date of the final auction, you might say well in the year 2020 this is the last auction period.

It's always going to depend on what the market conditions are and what the policy goals are. And that provides policy makers with additional flexibility. They can adjust incremental capacity goals annually if necessary to balance rate pressure if above-market prices are being paid for renewable energy technology are having too large an impact on overall retail rates.

There is no need for adjustments if renewable energy technologies are coming in at or below market prices. So if fossil fuel prices rise significantly then this will automatically address the whole issue of should you pay these sorts of subsidies. And the answer to that is you do not want to pay them a subsidy if they are at or below the market price.

To conclude, we believe that two-part design for a feed-in tariff would be economically efficient by setting up a target of incremental, renewable capacity by technology. It would promote installation efficiency and operating efficiency. This approach would elicit market information without extensive administrative burden. Capacity payments would be determined through an auction process. Energy payments would be tied to the spot market price. And renewable energy technology progress would automatically be taken into account over time.

This approach is easy to implement and it is easy to monitor. It provides policy makers with additional flexibility so they can adjust their goals over time. So with that, that concludes our presentation.

PRESIDING MEMBER PFANNENSTIEL: Questions? Thank you very much. Bill.

MR. KNOX: Thank you, Jonathan. Our next presenter is Paul Gipe, Wind-Works. We are just going to take a minute here to get control of the technology back over here.

MR. GIPE: While Bill is bringing that up I'd just like to thank the Commission and Commissioners for the invitation to be here today.

MR. KNOX: Paul, you need to go to a microphone.

MR. GIPE: My mic is on. Can you hear me? Is that fine?

Well thank you for the invitation to join you today. I believe that the mic is functioning. And I prefer to speak at the mic and I am going to ask Bill, when Bill is ready, to advance the presentation for me.

MR. KNOX: There we go.

MR. GIPE: Go to the next slide, please.

My topic today is Advanced Renewable Tariffs and then I consider them a New Policy Option for North America. Next.

And for me the reason why this is important is because until now North Americans are

simply dabbling around the edge of renewable energy policy. I don't think we as North Americans have really faced up to both the climate and energy crisis facing the continent today. So that's both Canada and here in the United States.

And I don't believe complacency is a policy option for any of here in North America. We must take action. And as Hermann Scheer, the author the electricity feed law in Germany says, there is no time to lose.

So why have the Europeans been so successful in the development of renewable energy? There's really two reasons. The first is they have engaged the community in developing distributed generation. Engaged the community, particularly in Germany and Denmark in developing renewable resources. Not just the traditional sources of the utility companies building renewable generation but actually the people who live on the landscape where the turbines or the solar panels are used.

And they have been able to do that with this policy method that I dubbed advanced renewable tariffs. And as you heard earlier in the presentation today, about 17 EU countries

currently use this policy mechanism that enables this kind of community participation.

And so where do we stand? If you look at the development of renewable energy in Germany, as we heard earlier in the presentation today, when did renewable energy really take off in Germany? Now they introduced their first feed law in 1991, the Stromeinspeisungsgesetz. That's literally the German in-feeding law. But things really began to grow most rapidly in the year 2000 and subsequently in the year 2004 when those tariffs, what I call advanced renewable tariffs. were introduced.

So where do we stand today in Germany at least? Eleven and a half percent of their electricity is produced renewables. Ten percent of their electricity is produced with new renewable technologies. One and a half percent is produced with old renewables, old hydro systems. Ten percent today produced with new renewables. As you heard this morning that is solar electricity, biogas from farm manure, biogas generation and of course wind energy. There's now 170,000 people employed in the renewable energy industry in Germany alone with a turnover of about

$20 billion per year.

There are 300,000 PV installations operating in Germany today, 2,000 biomass plants, and of course, some 18,000 different wind turbines. A total of 350,000 independent power producers operating in Germany today.

So I want to set the stage for what I am going to talk about the rest of my presentation.

So first I want to dispel some myths, common myths here in North America about renewable energy. Renewables are free. They're not free. Renewables are cheap. They are not cheap. In particular wind is not cheap, it's not free. Renewables can't be added quickly and in large amounts. That has been show to be false, particularly in Germany as we see today. And that net metering like we have here in California will ever make a difference. It won't.

So what is the philosophical context for these renewable tariffs that I am talking about? First, what are our goals? Now my goals are, the primary goal is the high penetration of renewable energy quickly. But I also have some secondary goals, and it's good for everyone here to know what those are.

First is that the generation is equitably distributed among all people, not just one particular group. Also I want to encourage rural economic development. It is very important to Canadians where I am working currently. And I want to generate sustainable manufacturing. Manufacturing of solar panels, for example, or manufacturing of wind turbines. And I want to encourage distributed generation so that we have generation of renewable electricity where it's needed, where the load is located.

So the big question is, as Wilson mentioned, the debate in the United States is do we want renewables or do we don't? In Europe it's, we want renewables, the debate is over what is the best mechanism. So the first question is, do we want renewables? And my answer is, absolutely we do because the of the questions around peak oil and peak gas and about the questions around climate catastrophe.

Many of us here in North America are not aware that there some 50,000 peopled died from the heat wave in 2003 in Continental Europe, 25,000 people died in France alone. So this is a big issue for Continental Europeans and it is now

becoming a big issue in Canada as well.

And I have not seen the level of support for renewable energy, the public support for renewable energy, at this level in about 20 years, probably even 30 years. People really want this technology today. And here in North America we want manufacturing jobs. In Ontario and in Michigan they are suffering the loss of manufacturing in the auto industry. Thousands of people are being kicked out of the manufacturing sector as our jobs move overseas. Places like Ontario and Michigan are looking to renewable energy as a way of creating new jobs.

So if we want renewable energy then what mechanism works best? How do we get contracts to people that want to generate renewable energy? Do we give the contracts to an elite few or do you give contracts to everybody who wants to participate in the electricity generating system? And how do we pay for that? Do we use RECs, ROCs or Green Tags? Do we have subsidy programs like the PTC? Or in the case of Canada the unfortunately named WPPI payment. Or do we use these advanced renewable tariffs, the feed-in tariffs that we're talking about here today?

So if we want to use a market model, and I think we're all in agreement on that, then what are the key elements of a market model. And that is, one, you get what you pay for. It's fundamental to understanding what we're trying to do here.

And if you want it, if we want renewable energy, you have to pay for it. And we have to understand the difference between the cost of generation and the price that we actually pay for it because that difference is the profit and the degree of profit is going to determine how fast we develop that renewable technology.

And what we've seen in Europe and we hope to see in Ontario is that high or premium prices deliver results. They deliver more generation more quickly and we hope more manufacturing jobs as well.

So as we pointed out today and Wilson has pointed out, both these systems, renewable portfolio standards, or what the Europeans call quota systems, and feed-in tariffs are market systems. In the case of the feed-in tariff the price is set politically and the market determines the volume, the amount of renewables that are

developed. In the case of the quota system or RPS system, we set the amount, that is the policy sets the amount, and the market determines the price. But both are market mechanisms.

So let's look at the status of market mechanisms in use worldwide today. Premium prices are what these renewable tariffs, feed-in tariffs, are typically used in non-Anglophone countries. They typically have very aggressive targets and are typically well under way to meeting those targets. We look at the quota markets, that's RPS or the auctions or tendering, whatever you want to call them. Typically Anglophone markets. That's North America, Australia, New Zealand, Britain. Typically very timid targets and they also typically seldom will meet those targets.

So if we look at the evolution of market mechanisms these ARTs or advanced renewable tariffs are developing momentum. And I believe the RPS or the quota program that we used here in the United States up until this time, I think we've reached a peak. There are going to be a few more states going to adopt quota systems, RPS. For example, Illinois just passed a law. But I think we're seeing the peak in the development of

renewable portfolio standards and I think even some of the bellwether states such as here in California, and certainly in Italy and certainly in Britain are weakening.

So what does it cost? In the case of Germany, what does it cost to have this feed-in tariff system? What does it cost the rate payer in Germany? It costs them only three percent. So 20,000 megawatts of wind, 2,500 megawatts of PV. Almost 1,000 megawatts now of biogas only cost their rate payers three percent of their electricity bill.

So how do they pay for German EEG? What is the justification that they use in paying these premium tariffs? Well in the case of wind, hydro and biomass the price of the tariffs that are paid are, of course I'll talk about it, are determined by the cost of generation. But the Germans believe that the cost that they're paying, the tariffs that they are paying, are less than the external costs avoided. The social and environmental costs are avoided by installing solar, wind and biogas, for example.

But in the case of solar photovoltaic, the premium tariff, the tariff that they pay for

solar photovoltaics is far higher than the social and environmental costs avoided.

But the savings they gain by installing wind, hydro and biomass at less than the social avoidable costs, the savings that they gain there are applied to the increased cost above the social and environmental costs of photovoltaics. So that the total expenditures are roughly equivalent to the social and environmental costs avoided. And this is just a recent study done by the BMU, that's the German Environmental Ministry, and this information is available in English.

So renewable tariffs. Are they unthinkable here in North America? As late as three years ago, absolutely unthinkable. People said I was crazy. When I went to Canada they said I was crazy. It just couldn't be done. Now I say yes, I think it is possible here in North America. It is certainly possible in Canada, I believe it is possible here in the United States as well.

I think the trend is growing towards advanced renewable tariffs here in North America and I think you are going to see increased discussion of this topic here in the United States as well as Canada.

In North America a number of organizations and political parties have endorsed the concept. In Canada the Liberal Party. In Ontario that's the Provincial Liberal Party, and the Green Party of course has endorsed this concept. And Canada's Federal NDP, that's the Social Democratic Party, it would be to the left say of our Democratic Party, they have endorsed the concept. And just as recently as March 21 in al Gore's presentation to the US Congress on climate change he specifically mentioned we need a national law to encourage homeowners and businesses to be able to sell their electricity to the network for profit. And a whole host of NGOs are now on board. Thank you.

So these advanced renewable tariffs are gaining momentum in North America. As Wilson mentioned, WE Energies has a tariff for photovoltaics in Wisconsin. Of course you have the program here in California for systems over 100 kilowatts. British Columbia and Ontario. Ontario has a program in place, we'll talk about that. British Columbia is considering adopting the form of the Ontario program.

As Wilson mentioned Hawaii did introduce

a bill. It was not heard -- It was heard but it didn't pass out of committee for a photovoltaic tariff of 70 cents a kilowatt hour. And Michigan is now considering a renewable, a feed law for the state of Michigan, I can't think of the term at the moment.

So these advanced renewable tariffs, what are they? Well they are feed laws or minimum price systems that we have been discussing this morning. It is a political price, it is not a political quota. They are simple. In most cases in Germany there are no contracts to sell electricity. In fact the German law says specifically that contracts are not necessary. You can have a contract, you can negotiate a contract but contracts are not necessary.

So how do they work? They have to be simple, comprehensible, transparent, with little or no administration.

Where are they being used? Well a whole host of countries, provinces and states are beginning to consider this and the list is growing.

So renewable tariff design, as you heard this morning, has to be simple, comprehensible and

transparent. You have to have a priority of interconnection and purchase. That is that renewable energy gets priority, priority for connection and priority for purchase. This is something we don't have in Ontario.

Prices have to be high enough to drive development. That's fundamental. Contract terms have to be long enough that the period that the tariffs are paid have to be long enough to provide profitability. And you have to ensure a fair but not undue profit. That is one of the key elements. And to do that you have to have this price differentiation that Hans talked about this morning.

Typically the contract length is 15 to 20 years, though in the case of the Spanish system the contract length is indefinite. As long as you can keep your plant running, keep your wind turbine running or your solar plant running, you get that premium tariff.

And the program limits. In Ontario there's no program limits, in Germany there's no program limits. In other countries there are program limits, typically high enough that they don't affect the program. For example France has

a very high program limit as does Spain.

MEMBER OF THE AUDIENCE: Excuse me for a second. I'm not sure, is the microphone on?

MR. GIPE: Okay, all right.

MEMBER OF THE AUDIENCE: That's better.

MR. GIPE: Sorry. For some reason I must get excited up here and -- I had it on a moment ago. I apologize.

So inflation adjustment, we'll talk about inflation adjustment. Germany has no inflation adjustment. Ontario, our program has 20 percent inflation adjustment; that is not sufficient for our purposes. Prince Edward Island, which has a simple feed-in tariff has a 26 percent inflation adjustment.

France's inflation adjustment is 60 percent. If the average prices went up about ten cents a kilowatt hour they would get six cents. It's 60 percent of the inflation rate. Spain is at 100 percent. As was explained by Hans, one of the problems with the Spanish program is it does inflate 100 percent with inflation. That's one of the major weaknesses of the Spanish program. And similar in Greece and Ireland.

So as I mentioned key elements of

designing renewable tariffs are price differentiation for different technologies. Solar gets one price, wind gets another, hydro and biomass so on.

And for different applications. In the case of the German tariffs for photovoltaics rooftop gets one price, solar panels or building integrated get another price, solar panels put on the ground get a third price and so on. For different sizes in case of biomass bigger projects get a lower tariff than small projects. And in the case of wind energy in both France and Germany tariffs are differentiated by resource intensity. It's a very important concept.

So we'll look at the differentiation for solar PV tariffs in Germany. As I mentioned if it's freestanding, that's out on the field, the Germans emphasize that they want solar installation solar on rooftops and on buildings, not on the ground, so they pay the lowest tariff for photovoltaics that are ground-mounted.

And the differentiated tariffs for wind. This is the concept of paying a different price for wind based on the resource intensity. And so that's you move wind energy away from the windiest

sites. For example, Tehachapi or Palm Springs or the Altamont Pass, so you avoid the wind ghettoization that we see in the Tehachapi Pass.

This is a problem that the Germans confronted very early on. They said, we want to move the wind turbines away from the coast, the windiest sites, so we want a tariff that pays more money at least windy locations. Because the interior of Germany is less windy than the coast. We want to move the wind turbines towards the interior so we will pay a higher price for wind turbines that have a less windy site than those that are on a windy coastline. And that actually has worked. Sixty percent of new wind energy development, 60 percent of existing development of the 20,000 megawatts is now in the interior of Germany in the Central Highlands.

So this in fact increases the flexibility of a program when you're trying to move wind turbines where the load is. Trying to get wind energy away from distant sites that have the high wind zones and move the wind turbines towards the, typically where the load is it's usually not so windy.

Typically the great cities of the world

are located in areas where it's not so windy. So if you want to move the wind turbines to where the load is you need to provide a tariff that encourages locations where it is less windy.

And this also increases opportunity. One of the key elements of these programs is everybody can participate. So if there is a farmer, for example, in Ontario who is in the interior of the province, not on a shoreline of one of the Great Lakes, who wants to develop renewable energy, who wants to develop wind energy, can only do so if we have differentiated tariffs and they have a price that is sufficient to drive that development. That is a price that is sufficient for profitability in the interior of Ontario as opposed just on the shoreline. We don't have that yet in Ontario.

In the German and French system. As Hans mentioned in the German system they have a complex process, a system called the referent price, referent turbine. A referent price for a referent turbine. The French have used a different system.

I'm not going to explain the German system right now because I don't recommend it for

North America. I don't think we're ready for this kind of program in North America. Our knowledge of wind energy is not sophisticated enough to actually implement the German system here in terms of these differentiated tariffs based on resource intensity.

But the French system is pretty straightforward. It's based strictly on resource intensity. The term I have used here is capacity factor but it can be used on energy yield, annual specific yield, which is what we prefer to use. And it's basically saying if you are at a base wind site that would be the lowest wind site where you want to have a tariff that guarantees some profitability. And then if you're at a windier site you get a less, you get a lower tariff. And if you're someplace in-between it's a linear interpolation between the high wind site and the low wind site.

And it is working very well in Germany -- I mean in both Germany and France and moving development away from the high wind sites. Because the French looked across the La Manche, across the Channel to Britain and saw how Britain's program was encouraging all the

development in the windy upland regions in the Pennines and there was a massive backlash against wind energy.

And the French said look, we're not sure we really want to do a lot of wind energy because we want to build some more nuclear plants. But we're going to do some wind but let's don't run into the same problems that we have, that the British have. Let's try to move the development across the country of France, not just put the wind turbines in Brittany or in Normandy. So now the wind turbines are literally found in most regions of France because of this kind of program.

So I'll talk about the Ontario program now. It's being called the most progressive renewable energy policy in North America in two decades and I'll explain why. It includes, wind, solar, hydro and biomass. So it includes all the technologies. As Wilson mentioned, for political reasons internal to Ontario we chose to go with a program that limited the size of the projects to ten megawatts at distribution voltage so that's 44 kilovolts and under. The program is open to everyone and there is no program cap.

So for wind, hydro and biomass they get

11 Canadian cents per kilowatt hour so let's say that's 10 US cents per kilowatt hour. Hydro and biomass get a peak period premium as well. That wasn't one of our suggestions but that is in the program. And solar PV gets 42 Canadian cents a kilowatt hour so about, right now about 40 US cents a kilowatt hour.

And the inflation adjustment, as I mentioned, is 20 percent. Except for solar. Solar was put in the program over the objections of the authority that manages the program and I think they were trying to be punitive here and say well, you got solar in the program but we're not going to give you any inflation adjustment. And the term of the contracts are 20 years.

So where do we stand in comparison to other countries in the photovoltaic tariff?

This is for wind energy. So wind energy is fairly comparable to what is being paid in Europe. The tariff in Ontario is fairly competitive with what is being paid in Europe. It's still marginal for development in Ontario which is considered one of the most expensive markets in North America if not the world.

And biomass is insufficient to drive

commercial development in Ontario. The price that we had proposed we considered a placeholder but that price was not accepted, the price is even less.

And in the case of solar photovoltaics it's about half the tariff that is being paid in Continental Europe, paid in France and Germany.

But it is the highest tariff offered in North America. Even the California Initiative, including the net metering. This is the highest tariff in North America and it's about 50 percent of what we need for distributed solar photovoltaics to make a profit.

So what's the status? The status is the residential PV, we've got about 150 kilowatts of contracts. And as Commissioner Geesman wisely pointed out, these are contracts, they're not on a roof yet. This program is six months old and you'll have to bring me back in about a year and say, what have we actually delivered. Because in the end all these programs are about what actually gets in the ground and the electricity that's produced. Commercial PV is now at 60 megawatts, commercial PV. Once again, contracts. They haven't turned a spade of earth yet. And one of

the projects is from a technology that's not even been built yet.

Twenty megawatts of hydro, 230 megawatts of wind, and they're signing about 100 megawatts of contracts per month. We expect we'll have about 75 megawatts of wind energy actually installed by the end of the year from the program. So the program is just beginning, it has a lot of problems.

Tariffs are too low. As I said, PV is about half of what we need for distributed. That's residential, small commercial, photovoltaics. Wind is profitable only at windy sites in Ontario so we haven't been able to distribute wind energy across the province. Biomass is way too low for commercial development of bio. Biomass and the inflation adjustment is too low.

So we proposed in our original submission to the government 13.3 Canadian cents per kilowatt hour so let's say, let's say 12 US cents, 11 and a half to 12 US cents per kilowatt hour. And we used the differentiated tariffs for wind energy. We had actually proposed a system based on the French program of differentiated

tariffs for wind energy.

Low wind sites. That would be a site say like one near the shore of Lake Ontario, it's not particularly windy, we get about 13.3 cents per kilowatt hour. And windy sites would only get say 10 cents a kilowatt hour over the 20 year life of the contract. Our proposal was not accepted.

So we need to see some of the elements that are wrong with the program. We need to reintroduce the topic of differentiating the wind tariffs so that windy sites get one price, less windy sites get another price. And we didn't win completely the philosophical battle.

The fundamental philosophical shift that's required here is the question of cost versus value. We argued that the tariffs should be determined based on the cost of generation plus a reasonable profit and the Ontario Power Authority, which would be the administrating authority in Ontario said no, it's the value to the rate payer and they came up with some kind of formula to justify it.

But since I was involved in the negotiations my argument is that the price is determined politically by the Premier's Office and

then they found a way to justify the price if the price is not sufficient. So we haven't completely won that philosophical fight in Ontario as yet but because solar is in the program, that solar is in the program does indicate that at least the political side, the government is willing to consider trying to encourage developments beyond just the value of electricity to the rate payer.

And of course in the case of Ontario they haven't invested in their electricity distribution system for going on 20 to 30 years. It's very, very antiquated.

We lost the language debate. In Ontario this program is called the standard offer contract program. These are not standard offers. They offer standard contracts at different prices to different technologies. But we lost that language debate. And as a consequence in other provinces in Ontario they are considering using this program. Their minds are fixed on this concept that it's a standard contract, one price for all technologies. That is not what we proposed. We proposed advanced renewable tariffs. And I strongly recommend you not to use the expression, standard offer contracts. Stick with feed laws or

renewable energy feed-in tariffs or advanced renewable tariffs.

One of the good things about the Ontario program, it does have the periodic review, a two-year periodic review. And we have suggested that the review begin two years after the Premier made the announcement of the program. The Ontario Power Authority of course says that they would like review to begin after they've launched the program, which is much later. And we have actually begun our evaluation of the tariffs in Ontario, whether those tariffs are going to drive the commercial development or not and what changes need to be made.

So Ontario certainly can do better. We'd like to think that Ontario is moving but it's not moving fast enough for my taste.

But we do have political commitment. Just a couple of weeks ago the Minister of Energy, he would be the person responsible for this, said at a public meeting in a speech, an after-dinner speech, that this is the right mechanism. That we want to find the right mechanism to spread wind development across all our areas. He was specifically referring to this concept of

differentiating wind tariffs by resource intensity and that they have a commitment to continue reducing the barriers to the program's success.

So as I say we have already begun the review process and we hope to add offshore wind energy to the tariff schedule. And we'll add solar domestic hot water, solar commercial hot water, geothermal and biogas pipeline injection tariffs into the program. That's our intent.

No assurance that we will accomplish that but that is our intent. Germany is considering a similar feed-in tariff for solar hot water. That is being discussed right now in the Bundestag. And the technology exists, of course, for metering.

One of the other things that we'd like to do, as I said the program has a project cap of ten megawatts. We want to lift the project cap so that there is no project cap. The projects can be as big as they want, say 10, 20, 30, 40, 50 megawatts or higher. And we lift the voltage cap as well. So we begin to move some of this commercial wind development off the distribution system out onto the transmission system.

And we want to provide priority access

to farmers, homeowners, First Nations, that's the indigenous people of Canada, and cooperatives.

So there are a number of provinces that are talking about replicating the Ontario model. British Columbia, Saskatchewan, Manitoba and unofficially Qu,bec. There are people pushing for this in Qu,bec, Nova Scotia and now as I mentioned, Michigan. We hope to introduce a bill in Michigan's Assembly soon.

So advanced renewable tariffs, again, deliver more capacity more quickly. And I think very important for all of us, more equitably. Because if we want public support for renewable energy everybody has to feel that they are going to be able to participate in this. If you want to charge all rate payers a fee for the cost of such a system everyone in the system must feel that they have an opportunity to participate. For example, by putting solar panels on their roof. Doing it to earn a profit, not necessarily to save the earth.

So for me feed laws are fair and nearly everybody can participate.

And it's no time for half measures and no time to lose. We need to take action, we need

to take action immediately.

So for me, renewables, when you look closely, they are worth every cent. And I'd just like to point out, I don't get this opportunity to do this very often, that that solar panel that you're looking at was at one time the largest photovoltaic power plant in the world. It was located here in California. And it was disassembled and sold worldwide. But that was here once in the early 1980s.

So renewable energy is both for us for today, it is also for tomorrow. It's for us who live today but it is also for our children and our grandchildren.

Renewable tariffs, a new policy option for North America. I'll take your questions.

ASSOCIATE MEMBER GEESMAN: That slide you had of the solar system that you said was here previously.

MR. GIPE: Right.

ASSOCIATE MEMBER GEESMAN: Was that the SMUD installation?

MR. GIPE: No actually that's not. That was ARCO Solar out on the Carizzo Plain.

ASSOCIATE MEMBER GEESMAN: Thanks.

PRESIDING MEMBER PFANNENSTIEL: Thank you very much.

I think we, now we're going to get back to, for discussion after lunch. I think the concept now is that we will break for lunch and reassemble at 1:15. Thank you very much.

(Whereupon, the lunch recess was taken.)

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AFTERNOON SESSION

PRESIDING MEMBER PFANNENSTIEL: Why don't I hand it off to Pam to begin.

MS. DOUGHMAN: Hello. Is the microphone on? All right. So now we'll be having a roundtable discussion. And for the benefit of the people that are -- Yes?

UNIDENTIFIED SPEAKER: Your microphone isn't on.

MS. DOUGHMAN: It is on?

UNIDENTIFIED SPEAKER: It's not.

MS. DOUGHMAN: Not on. Try that. Hello?

UNIDENTIFIED SPEAKER: There we go.

MS. DOUGHMAN: Okay, all right.

So for the benefit of the people who are listening over the Internet I'll just list the names of the people who are participating in our panel. And we will be going over the questions in Attachment A that's attached to the notice. There are four questions and I'll read them.

And I'd like to group, group the questions so we'll be doing questions one and two together and then questions three and four. So we'll be able to flip the page, three and four are

on the back side of the page.

So our panelists include Frank DeRosa from PG&E and Stu Hemphill from Edison, Southern California Edison, Lad Lorenz from San Diego Gas & Electric and Steven Kelly from Independent Energy Producers. And we have Paul Gipe from Wind-Works. Then we have by WebEx we have Jonathan Lesser from Bates White. And we have Wilson Rickerson from the Center for Sustainable Energy and we have Hans Cleijne from KEMA and those are our panelists.

Okay, let's see now, our first question. The 2007 IEPR Committee is asking that parties address the following questions in their verbal and/or written comments for this workshop. The first question for this roundtable discussion is:

To encourage additional renewable energy development explain whether and why you support:

a, Creating California renewable feed-in tariffs instead of an RPS in the 1011-2020 time period.

b, Creating feed-in tariffs as a complement to an RPS in the 2011-2020 time period.

c, Developing feed-in tariffs or similar incentives as part of the current RPS program to meet 2010 targets.

Or d, None of the above.

Let's see. Then together with your answer to the first question please consider, please answer question number two which says:

The 2006 IEPR Update noted that feed-in tariffs have contributed significantly to impressive levels of renewable energy development in Germany, Denmark and Spain and recommended similar policies for California. Is any updated information available on the disadvantages and benefits of using feed-in tariffs in California for renewable energy?

And please answer that question for the policy option you selected in question one, if that makes sense. So for example if you support creating a California renewable feed-in tariff instead of an RPS for the 2011-2020 time period please focus your comments on question two to that option.

I am also an assistant professor so I am going to ask you to raise your hand when you'd like to speak and we'll just go around in that order. (Laughter) Go ahead, Frank.

MR. DeROSA: I'll start. Is this microphone on?

MS. DOUGHMAN: I think you have to be closer to it. But I'm concerned that sometimes, sometimes the WebEx people hear us too loudly so please let us know if we need to adjust our speaking.

MR. DeROSA: How does this sound?

UNIDENTIFIED SPEAKER VIA TELEPHONE: I can't hear the speaker at all right now.

MR. DeROSA: Okay, how is this?

UNIDENTIFIED SPEAKER VIA TELEPHONE: That's better.

MR. DeROSA: Okay. I have to press the button, I learned. Okay, well thanks for the opportunity.

I think it's important to understand what we have in place now in California. So under the RPS program we at PG&E, and I think this is true for Edison and San Diego as well, we have a standard contract. That contract was developed by a coalition of utilities, independent power producers, my friend Steven next to me here participated in that, environmentalists and consumer groups as well. And there are others in the audience who participated in the development of that contract.

So we issue a solicitation, that contract is part of it. If a bidder were to bid their price and win the solicitation, if they were willing to accept that contract they could sign that contract and they would have a power purchase agreement. So there is, there is a standard contract.

At PG&E we target one to two percent of our load each year for our renewables procurement but we are not limited to that. And in fact last year we procured more than that. So there's an overall cap that is the 20 percent target and there are some financial caps which are the public goods charge. But in any given solicitation there's really not a cap.

So broadly you could say that we have a process that is pretty close to a feed-in tariff. The big difference is that there is not a set price. Ultimately it's a market price that is broadly around in the range of the MPR.

And in fact the contract has time of use factors as well so the point that Jonathan made earlier of providing an incentive for on-peak generation is built into that contract. So it's a little different than the structure that Jonathan

has proposed but the main, the main difference is that there is not a set price.

So you get to the question of, so how much should you pay, how much should we all pay. And at prices of $110 a megawatt hour for wind or $570 or $700 a megawatt hour for solar, prices that hark back to the height of the energy crisis. You know, I think the worry is, is that an efficient way to spend our society's funds. And Hans --

ASSOCIATE MEMBER GEESMAN: Where did you come up with those prices, Frank?

MR. DeROSA: Those were in the presentations. The $110 for wind was, I believe was Ontario, Paul, and the $570 I think was Spain. And the $700 was the legislation in Hawaii, that was not passed yet, was my understanding. High prices.

And so, you know, the concern would be, as Hans pointed out and Jonathan, that, you know, are we spending money on marginally efficient renewable generation and does that lead to, you know, counter-intuitive results. You know, sort of the energy equivalent of paying people not to grow crops and gaming and things like that. So it

really is, you know, a question of price. Now I think we --

ASSOCIATE MEMBER GEESMAN: Well let me turn that around a little bit because I really think that this particular approach is skewing the discussion. I think, I think most of the focus of today is on the mechanism rather than on the price. And let's hypothesize that as it regards large scale wind, for example, we're talking not about a price above today's market price referent. In fact, not even a price set at today's market price referent.

Let's hypothesize that the feed-in tariff for large scale wind would be below today's market price referent. Then you can address the mechanism itself as to whether that is something that would lend itself to California's objectives.

MR. DeROSA: Okay. So yeah, if you put a price that, you know, something, you know, market-based as you say, John. I guess I would come back that the RPS process is very similar to a feed-in tariff then. You know, there is a standard contract.

I'm sure Stuart would agree to this too that I definitely would like to see the selection,

the negotiation period after selection shortened, you know, from the, you know, four, six, eight months that it typically takes to finally execute a contract. But we always seem to find with the developers that there's some, you know, circumstance of the project, you know, some issues that need, the contract does need to be customized. But definitely always, you know, looking for ways to shorten that period.

ADVISOR JONES: Can I ask a question, Frank?

MR. DeROSA: Yes.

ADVISOR JONES: You mentioned that you have the standard contract and that anybody can sign that. Can you give us a sense of what proportion of your contracts have actually signed that kind of a contract versus a, you know, more focused one?

MR. DeROSA: A more negotiated contract.

ADVISOR JONES: Yes.

MR. DeROSA: Right. None of the contracts that we signed, I think we have like 27 contracts now. None of them have been just, yeah, we'll step up and sign that contract. So they have all undergone negotiation to some greater or

lesser degree.

ASSOCIATE MEMBER GEESMAN: So that standardized contract hasn't been particularly attractive to your counter-parties.

MR. DeROSA: Well I think, and maybe Steven could speak to this if I don't use up all the time. That, you know, it just -- Each project has individual -- issues aren't the right word perhaps. But there's some reason. Even though, you know, it was the best intentions of this broad coalition of people to, you know, prepare a, you know, financeable, acceptable contract. That, you know, each project just has its unique circumstances. So that's the, that's the dilemma that I think we both face, both seller and the buyer on that.

If I could just say one more thing and then I'll stop. That I think that, you know, the policy makers really should focus on, you know, what's the efficient policy. And maybe that's, John, what you're getting at with the mechanism.

Now that we have AB 32 it's really how do you, how do you account for externalities. Because I think everyone in the room agrees that

there are externalities. In essence, you know, carbon, national security, other things, that are not reflected in the prices that renewables are competing with.

So what is the most efficient way to determine those externalities and implement government policies to, you know, to make sure that there is an efficient process. And I think AB 32 with the move to a market-based process for capturing the externalities around greenhouse gas reduction is the way to go. I think it's probably not the most efficient way for policy makers to try to pick winners and losers in technology, which I think is a danger of a broad feed-in.

And I'm done.

MS. DOUGHMAN: Okay.

PRESIDING MEMBER PFANNENSTIEL: Not quite, I still have a question. So you would think that in this post-AB 32 world if we reach a point of having market mechanisms for valuing the carbon content or the externality content that we wouldn't need an RPS?

MR. DeROSA: I think maybe in the long run that, you know, a cap and trade system would -- government sets the target, okay. It's 90

percent of, I forget what it is now. Eighty percent of 1990, you know, carbon reductions. And that is based on, you know, a lot of analysis. The Princeton guys and their slices and all of that. But that's the target.

And if you have a cap and trade system then the market will pick the best ways, the least cost ways to get to that target.

PRESIDING MEMBER PFANNENSTIEL: Thanks.

ASSOCIATE MEMBER GEESMAN: Well Frank, again I want to bring it back down a little bit to a more pedestrian level. I don't want to talk about AB 32. I'm not focused on externalities at all. I'm looking at California, the experience in California's RPS program today.

I see 80 contracts, I see 75 of those 80 contracts below the market price referent. The market price referent doesn't attempt to incorporate externalities. Today's projected price of electricity from a future ultra-efficient natural gas fired combined cycle power plant. Seventy-five out of 80 RPS contracts have come in below that market price referent.

From the rate payers standpoint it would be better if we had 76 out of 80 or 79 out of 80

or 150 out of 200. We want more of these below market price referent contracts. So I'm not getting to externalities yet, I'm not getting to AB 32. I'm trying to figure out why the slope of that graph representing Germany's experience goes upward in terms of actual kilowatt hours or gigawatt hours delivered, whereas the slope of the California experience is a horizontal line. And trying to determine whether a mechanism which gives every generator willing to produce at a specified price the legal right to sell that power to you. Would that produce a more positive sloped curve in terms of actual generation?

MR. DeROSA: At PG&E we have, we have not turned down any proposals that are cost-effective. Now that is a subjective term. But, you know, I think you all can get a sense of what we're talking about in terms of cost-effective.

Typically in California in our experience is that the projects, many projects are just not fully developed yet for the seller to step up to the obligations of the contract. I don't think, John, that setting a particular price is the obstacle, you know. Again, unless you want the price to be, you know, way up there then sure,

you're going to get, you know, then you're going to get more projects.

ASSOCIATE MEMBER GEESMAN: Thank you.

MS. DOUGHMAN: Okay, Wilson, go ahead.

MR. RICKERSON: On answering that one I think that I'm going to resist the urge to engage in the AB 32s and the market externalities. I think there's plenty of ground that we could till for the next hour and a half on that and I'm sure you've all done it without me being in the room sitting up in Boston.

But just on the one question of, you know, question one. Picking between them or one, place the other, instead of the other. I'd just like to reiterate what I was talking about in my presentation where I don't think it has to be that kind of zero sum or antagonistic game that you can't actually blend them productively and reasonably into the existing framework.

And in terms of updated information. I mean, just the IEPR 2006 was written with 2005 data. We just continue seeing the same trends in Europe now with the feed-in tariffs that have been structured to work. We see an increase in actual generation, diversity of the portfolio and without

a substantial impact on prices.

MS. DOUGHMAN: Okay, Stu is next.

MR. HEMPHILL: I think when I look at question one our experience is, and one of the reasons why we put a biomass standard offer, was because we felt we could address a part of the market which wasn't being addressed already. And so from that standpoint it was a complement.

Our current RPS program is for one megawatt and above and so what we found in talking with developers were that there were some smaller scale generation facilities that were available and -- excuse me.

UNIDENTIFIED SPEAKER: One and below.

MR. HEMPHILL: No, the current RPS program is for one megawatt and above and so we created something for the one megawatt and below. We also found some developers who had difficulties that were just above one megawatt getting through the process and so what we did is we created three standard contracts as a way of helping to facilitate and make easy that part of the market.

A part that we find, when we go through competitive solicitations we find an abundance of wind and solar and geothermal. Biomass seemed to

be lagging behind and so this was an opportunity for us.

The second part of that story is that all of the big contracts that we sign are transmission constrained. And when you look at the smaller biomass facilities they typically can interconnect at the distribution level and so this became, again, what might be an easier way to get some additional megawatts out of the existing system without the burden of trying to get them interconnected, which is a substantial challenge in California.

Regarding any updated information, yeah, there is one thing that is something that we ought to be taking into account when answering this question. When you talk about Germany and Spain and the Netherlands you have to look at what's the source of funds. In some of the countries it's a tax and that's being levied across all customers, all citizens of the state.

If one is to develop something with the purpose of creating new renewables you'll want to make sure it's somehow being appropriately matched with the retail market in California. One of the things that we're seeing here is the potential to

go back to direct access. So by having it at the wires level it helps to facilitate the market as it is being contemplated in California.

ASSOCIATE MEMBER GEESMAN: It would seem to me that, you know, to take the example of the production tax credit, which, you know, the American wind industry in particular suffered from the on-again/off-again aspect of that financial incentive.

Were we to focus our incentives more on rate payer sourced incentives there may be the prospect for a more durable and enduring incentive structure that would avoid the problem that the wind industry has faced with the PTC. It might actually stimulate some manufacturing activity in this country.

Now that is a little far-fetched in terms of needing to be a policy administered on a national basis, I think, rather than a single state. But there's something wrong about a promotional policy that only extends the carrot a couple of years at a time.

MR. HEMPHILL: I definitely agree with that, Commissioner Geesman. You know, durability is always an issue. One of the other issues

regarding durability that concerns me with feed-in tariffs. What we did with our standard offer contracts is we increased performance requirements as they became larger. We expected that normal, biomass facilities could be part of our competitive solicitations above 20 megawatts.

But my concern, and it is too early to tell from the European experience, is to whether investment will be made and it will be left and abandoned. Which is some of the things that we have seen out in the wind areas today back from the old standard offers. Too early to tell today but it's another design criteria worth consideration.

ASSOCIATE MEMBER GEESMAN: How do you avoid that in the current RPS structure?

MR. HEMPHILL: We have performance requirements. So there are performance requirements, potential penalties. If they say that they'll meet a particular capacity factor, if they don't meet it over a period of time then there are potential penalties. So there's a way of assuring that the facilities are being maintained.

ASSOCIATE MEMBER GEESMAN: Couldn't you

build that into a feed-in tariff structure as well?

MR. HEMPHILL: Yeah, that's why I said it's one of the design criteria.

ASSOCIATE MEMBER GEESMAN: Okay.

MR. HEMPHILL: So what we, what we did in our standard offer is at the very lowest level they are much looser and as it gets bigger there are higher performance requirements.

MS. DOUGHMAN: Okay, Steven is next I think.

MR. KELLY: Thank you. What I'd like to do first before I even get into kind of the substance of some of the points I'd like to make is talk a little bit about definition and the concept of a feed-in tariff. When I think of a feed-in tariff I think of like an ISO tariff which governs how people interconnect and deliver to the transmission grid.

A lot of the nomenclature or the description of programs that I'm hearing about and I have been reading about over the last couple of weeks in preparation for this workshop are what we used to call standard offer contracts. And I think they are very different and the implications

of them are very different. So I just want to urge us to try to use common language. If we're talking about a tariff in a transmission interconnection vein there are different implications of a feed-in tariff then if we're simply talking about standard offer contracts. So I just want to make that point.

From my perspective the biggest and most fundamental goal that we should be employing in California is to get installed generation capacity from renewables. And this is for carbon reasons, it's for fuel diversity reasons and so much more. But at the end of the day it's the program that is going to be the most effective in getting generation actually installed and interconnected to the grid at either the transmission or distribution level.

So when I look at these types of programs and try to evaluate them the prism that I apply is what is it going to do to incent people to actually invest money to build the generation in as quickly as time as fashionable and is it financeable.

In regards to the feed-in tariffs that we have been talking about today and in response

to these questions there are a couple of pros and cons that I'd like to go through and put on the table. In terms of the cons. And I'll say that I am still in the process of evaluating this.

But certainly under my concept of a feed-in tariff the interconnection rules are pretty important. If what we're talking about is, is there going to be a tariff mechanism that is going to allow a certain type of generator to interconnect to the grid as they get developed automatically there are queuing issues, there are a lot of issues that that brings up that we need to think through.

The other connected point to that is that it may trigger some federal preemption issues and that we need to think about what it means to have a feed-in tariff interconnection policy at the state level that may or may not be consistent with FERC's recently introduced generator interconnection policy.

I don't know the answer to that but I just put it out there as something that has got to be considered in the design feature of something like this if it's a true feed-in tariff. And by that I'm thinking of generators have spent the

money, they did the permitting, they did the construction. They may not have negotiated with the utilities at all or the ISO but they have been able to get their power to the grid at a certain point in time in order to realize a payment stream for a certain amount of time in the future.

Having said that, in terms of the positives of a feed-in tariff: One, it may solve the problem that I perceive of project viability that we have been experiencing, I think, in the RPS implementation over the last couple of years. I mean, obviously if it's a true feed-in tariff you're only going to get paid if you actually delivered energy to the grid, therefore you are viable.

Stu made a comment about abandonment. It's certainly something that we would need to address in design features. I'm not sure it's a major problem. Somebody abandons a project, particularly a new project. I suspect there's tons of money that would step in and get that project for ten cents on the dollar and off you go again. The important thing is to have the interconnection.

If we're -- The other thing that a pure

feed-in tariff might have the advantage is overcoming the delays in timing that we see today and the conduct of an RFO, an RPS RFO, and then the final approval at the PUC. Because during that pending pendency of the finalization of those contracts what we are experiencing today is the prices are moving away from the contracts.

And Frank mentioned that it takes four to six months to negotiate an RPS contract but I think it takes anywhere from 12 to almost 18 months from initial RFO to final PUC approval. That is a huge amount of time and invariably the bid prices going into an RFO are going to be out of the money when it finally gets to the Commission. And we need to figure out a way to try to make that work faster.

As I had indicated a feed-in tariff may have some advantage in terms of the transmission queue. I've got to think this through a little bit. We are working on a project to deal with project viability and project milestones. I think I talked about this the last time I was in front of this Commission. Certainly it might provide a means to address the least cost/best fit mechanism once you have established a price that you're

willing to pay for renewable generation. Anybody who can deliver at that price it's a good deal and it should go forward.

And then finally in relationship to the contracting of the feed-in tariff paradigm if we were actually talking about that. I think it's certainly possible that one could set up a regime where you can set a limit on the amount of megawatts. You know, in the old standard offer days there was an unlimited number until it appeared that there was going to be way too much and then they cut it off. And I think we would want to set some certainty in the process by maybe looking at megawatts.

That issue of megawatts, if you go down the contract path as a paradigm for a feed-in tariff I think it's pretty simple to start differentiating. I know there was a lot of discussion this morning about differentiating amongst technologies or whatever and I know Edison has started down that path already.

You may not need to do it by technology, you could do that by product. We need baseload, we need load following, we need peaking, for example. And you don't necessarily need to

differentiate at this point in time between the various technologies unless you have a public policy purpose in doing that and there may be well some good ones, jobs, economic development and so forth that we need to consider.

So those are my comments at this point.

MS. DOUGHMAN: Okay, who would like to speak? Lad.

MR. LORENZ: Commissioners for those of you, and fellow panel members, for those of you who don't know me I am Lad Lorenz, Vice President of Regulatory Affairs for San Diego Gas and Electric and also the former Vice President for Electric and Gas Procurement at SDG&E before I took on this assignment.

Frank gave I think an accurate description of the current process that SDG&E is using, that is, competitive solicitations. We have done competitive solicitations every year for the last four or five years. We are making progress in achieving the goal of getting actual generation. I absolutely agree with Steven, that's the, that's the objective, that's the goal we all want to see. We are making, we believe, substantial progress in that front.

I will talk about contracts. We have 13 percent currently under contract. We believe we are going to get to the 20 percent under contract by 2010. We have gone from basically zero production, actually energy generation, up to an excess of six percent last year. We think we'll be over that this year so we're making progress in getting actual production.

I thought it was interesting that in framing the workshop it doesn't appear that there was really any consideration being given to the current competitive solicitation as the appropriate approach. And so I guess in answer to the question, one, we sort of come down on the neither, none of the above. We like that current competitive solicitation process. We think it's working with those goals determined. In a long-term procurement plan that would be the best approach, we think, to meeting the goals by 2010.

The problem is an RPS mandate really focuses on quantity. A feed-in tariff seems to focus on price. We think a competitive solicitation is the way to marry those two so that you have goals and competitive prices. We have taken, in our competitive solicitation we have

taken everything that has been offered to us at or below the market price referents. So that, we have contracted for everything that has been proposed to us that is at or below that level.

The current barriers we have talked about in these proceedings, permitting and transmission being the two major barriers we think. Feed-in tariffs don't address either of those issues from our perspective.

In Germany that wind feed-in tariff was accompanied by a national law requiring cities to identify wind site development so that stable policy environment that is very important for development was certainly there in Germany. I think a feed-in tariff has been available in Germany since '91 but the actual growth didn't start until 2000 with that more stable regulatory environment. So that may be a bigger explanation for why progress is being made than the development of the feed-in tariff.

So those would be my initial comments.

ASSOCIATE MEMBER GEESMAN: Lad, both Commissions and the Governor have identified a 33 percent target in year 2020 as a desirable state policy and it would appear from at least what you

read in the newspaper the Legislature may weigh in on that question this year as well. Would you see carrying on the existing structure of the RPS program beyond the 20 percent goal to achieve that larger target as well?

MR. LORENZ: Yes. We are not supportive of a new RPS standard at this stage. We are going to -- Our goal is to reach the 20 percent by 2010 and continue on. We are not going to stop at 20 percent. But in order to make the competitive solicitation we think produce the best prices another mandate is probably not what we would support at this stage.

ASSOCIATE MEMBER GEESMAN: Well leaving the mandate question out of it for the time being the subsidy funding that the supplemental energy payment account was designed to achieve the 20 percent target, would you envision adding to that after the 20 percent target is achieved or not having a source of subsidy funds?

MR. LORENZ: I'm not sure I know how to address that. The problem that we have seen with supplemental energy payments or the SEP funds, it hasn't been that successful so far, you know.

ASSOCIATE MEMBER GEESMAN: You know, I

think I would say it has been a miserable failure so far. And I guess --

MR. LORENZ: So I'm not sure continuing it is --

ASSOCIATE MEMBER GEESMAN: That to me weighs fairly heavily in this discussion as to what kind of instrument the state ought to rely upon in the future. If you assume -- Let me reverse the hypothesis that I was discussing with Frank.

If you assume that there will be some projects above the market price referent that for any of a variety of reasons, we'll call them internalizing externalities, state policy says, you know, we ought to do that project, or we ought to do these kinds of technologies. Let me hypothesize that we decide that there are waste disposal benefits to biomass projects so we ought to be willing to pay more than the market price referent for biomass projects.

Today's structure, competitive solicitation with this supplemental energy payment source of subsidy relies on you to conduct a not particularly transparent solicitation process.

MR. LORENZ: I would argue that.

ASSOCIATE MEMBER GEESMAN: You turn up -- Well it's certainly not transparent to members of this Commission.

MR. LORENZ: I understand that, but it is transparent at the PUC, I believe.

ASSOCIATE MEMBER GEESMAN: Well we'll get into that.

(Laughter).

MR. LORENZ: Okay.

ASSOCIATE MEMBER GEESMAN: You turn up a population, a pretty small population of lottery winners or beauty pageant winners and they are pushed forward to the honey pot that this Commission administers, or perhaps the PUC administers in the future.

One project, two projects, a small number of projects potentially can drain your source of subsidies. Wouldn't it be a more efficient way in which to administer a subsidy program if you targeted to particular performance criteria or technology types that you wanted to encourage rather than rely on the beauty pageant, transparent or not?

MR. LORENZ: I don't think I would characterize it as a beauty pageant.

ASSOCIATE MEMBER GEESMAN: The winners have been pretty ugly so far so I think I'd agree with you.

MR. LORENZ: That's right. But some source of funds for projects, for worthwhile projects that come in above the market price reference is advisable and something that we think is important. We think that there is a need to continue to advance technology, to have a diversity in the portfolio for renewables. And if that's, if that's the way to achieve those goals that's important. But I think it can be done within the context of the competitive solicitation rather than a, rather than going down the path of a feed-in tariff.

ASSOCIATE MEMBER GEESMAN: Stuart, what are your thoughts on that?

MR. HEMPHILL: I think there's a fundamental question about where we want to go with California's program and it's either going to be a market base system or administrative system. And I think if we're going to go down a path of having retail competition you also have to choose a market-based system. Otherwise you're going to potentially disadvantage one set of companies

versus another.

If you're going to go down an administrative program. And we can talk about either one, I'm perfectly okay with either one. That's something that is being done on behalf of society and that's something that society ought to be charged for, either through a wires charge or through a tax.

I think that those are fundamental forks in the road. Do we want to go administrative, do we want to go competitive? That helps you decide how you want to answer the question about competitive solicitations or feed-in tariffs.

Frankly, as I said before, we think we found a way to use a standard offer to address a part of the market that wasn't being addressed already and that's -- for us that was broadening the market and potentially, hopefully getting more megawatts sooner.

But more broadly I'm trying to answer the big question which is, I think if you choose an administrative program you have to choose, you're already choosing a funding source our you're creating problems in the market, in the competitive market.

ASSOCIATE MEMBER GEESMAN: And you'd characterize today's RPS program as a competitive mechanism --

MR. HEMPHILL: Yes.

ASSOCIATE MEMBER GEESMAN: -- as opposed to an administrative mechanism.

MR. HEMPHILL: Yes it is.

ASSOCIATE MEMBER GEESMAN: How is the market price referent set if not administratively?

MR. HEMPHILL: That is set administratively, yes. But there is a competitive market out there. We get abundant supplies every time we do a competitive solicitation. I would say it's very robust competition.

ASSOCIATE MEMBER GEESMAN: And would you say it's an efficient way in which to administer a subsidy program?

MR. HEMPHILL: A subsidy program sort of goes in the face of competition so I'm not sure that's, I'm not sure I understand the question.

ASSOCIATE MEMBER GEESMAN: Well.

MR. HEMPHILL: But let me just, there was another point. Let me just add to that a little bit. You know, we also signed 25 contracts. The top four contracts represent about

70 percent of the energy. Two of those are from existing projects and two are from new. And so it's these very large projects that are producing the bulk of the kilowatt hours as we, as we move forward.

So I see if we're going to go beyond 20 percent, that we continue to maintain some way to have these very large scale competitive projects participating in a solicitation. So I think there's a role for that as well as a potential role for feed-in tariffs depending on how they're structured.

MS. DOUGHMAN: Steven, Steven.

MR. KELLY: If I may I'd like to respond to this a little bit because I think you can actually achieve the competitive outcome that Stu is talking to you without dealing with the SEPs money. I mean I for one, as you well know, think that part of the RPS program has been abysmal and one of the reasons is none of the money has ever been spent. But you can --

ASSOCIATE MEMBER GEESMAN: That is not necessarily a bad thing.

MR. KELLY: No it isn't if you still achieve your goal of installed capacity in a

timely manner and I'm not certain that that's occurring either. But --

ASSOCIATE MEMBER GEESMAN: I think I'd rather miss the goal than waste six or seven hundred million dollars.

MR. KELLY: Well I think there's a mechanism that you can do both. Because all these contracts are approved by the PUC, at least the ones that are entered into by the IOUs.

We ought to be able to have a mechanism that the utilities go out for a product, whatever it is, if it's the biomass mechanism that Edison is doing right now. And they ought to bring the offers that they find to be the most competitive to the Commission for approval.

And the Commission should review those and determine if it makes sense to pay that, whatever it is, and do it and roll it through rates and avoid the least cost/best fit MPR calculation because it's really irrelevant at this point. Solar is going to be a price even when competitively procured. All of these various technologies are.

What we need is a mechanism to timely find out what the price is for installed

generation that has a high probability of being installed in a timely manner. And take that to the Commission and have them approve that. And if they don't want to approve then they can explain to the public why those projects are not being approved. And that's, I think from the competitive perspective, at least the developers, are willing to live with that.

PRESIDING MEMBER PFANNENSTIEL: So this would be done in a, in a public forum.

MR. KELLY: Definitely.

PRESIDING MEMBER PFANNENSTIEL: It would be totally transparent.

MR. KELLY: And I would like a little more transparency definitely in the decision-making about which projects move forward and why. But the Commission has the authority to make that decision. And if it turns out that, you know, 60 cent solar is a good deal at some time in the future then approve it.

ASSOCIATE MEMBER GEESMAN: Let me suggest to you that would probably be the last solar project developed in California. And let me also say that in the five years that I have been here each of the utilities have managed to get one

subsidy candidate project approved by the Public Utilities Commission.

In one instance after a period of fairly widespread ridicule in the press that the project was simply too expensive and probably didn't qualify for supplemental energy payments anyway the Commission chose to reconsider and that project never went to us for consideration.

In another the utility said to us, we don't got to show you no stinking documentation. And as we described, I believe in our 2006 update, it was the equivalent to asking us to put the money in a brown paper bag out in the park across the street. Well that project didn't go forward. The utility withdrew it ultimately from its list of successful contracts as not having been able to meet contractual requirements.

In the third instance what we saw was not consistent with what the CPUC approved. Option dates had already expired, the size of supplemental energy payment was almost twice what the contract had contemplated being applied for. So I think the notion of avoiding a massive waste of money if this program is going to be successful needs to be one of our paramount objectives.

MR. KELLY: I don't disagree with that. But it seems to me that between the Public Utilities Commission you have the wherewithal to evaluate these contracts to determine whether it's in the public interest or not and move forward on that basis.

We're really talking about cost recovery here and where the money is going. If you've come to the conclusion as a matter of public policy that you are willing to pay X for any particular project and it looks viable then you should approve it in order to get on with it so they can get developed and roll it into rate.

ASSOCIATE MEMBER GEESMAN: Is the state better off trying to make that subsidy judgement generically on the basis of technology type or location or some other discrete set of criteria? Or is it better off going through what Stuart describes as a competitive market process but what I described as a beauty pageant and then awarding the lucky winner with large sums of money?

MR. KELLY: Well in the instance you're doing it once and you're probably doing it once every couple of years as the prices of these technologies change. This would be the feed-in

tariff. We're going to disaggregate prices by technology for a certain period of time. And if people can get contracts that's what they're going to get and you're going to have to do that repeatedly over the years.

The other mechanism is you're going to do it every time a contract comes to you and you're going to make a determination that it's a reasonable price to pay for that kind of energy capacity. I am not sure if one is more efficient than the other, quite frankly, at this point.

PRESIDING MEMBER PFANNENSTIEL: Two criticisms of the current system that we have heard often: One is that it really does take too long. And Steven, I think you said that a few minutes ago. And the other is that there is no assurance that the funds will be there over time when the developer needs them and therefore the projects are somewhat harder to get financing for.

Wouldn't -- Would. Another way but a more positive way. Would a feed-in tariff necessarily alleviate both of those concerns or either one of them? From the discussion we were just having, the exchange that was just going on, it seems like the non-feed-in tariff way of going

to the PUC with contending, winning contracts might in fact expand the time that it takes to get this whole thing done but maybe has a higher level of assurance that the funds will be there once the dollars go into rates, for example.

What is your feeling? Let me ask anybody there who would like to comment on that.

MS. DOUGHMAN: I think Frank had his hand and then Stu and then I'd like to go to Jonathan.

MR. DeROSA: Okay. On the SEPs, the pot of money. I think everybody agrees, and you and the other Commissioners have been proponents of this to, you know, fix the SEP problem and so that's what SB 1036 tries to do.

And I think that would fix that financeability problem where if you had, the funds were still available but it was, it was -- once the contract was approved it would be approved for the entire price of the contract so that the seller knows that they're going to get all, you know. They're going to get paid that price, they don't have to go through two separate routes. So I think, I do think that solves that problem.

The question that Steven brought up of,

you know, do you go a feed-in tariff or do you approve contracts one by one. I think the Public Utilities Commission is looking for the kind of guidance that, John, you and Steven were just talking about. They're worried about the same thing that you are of, gee, a couple of these, you know, big contracts could eat up the whole pot. So, you know, where, you know, where is the overall policy guidance to say, you know, multi-hundred million dollar transactions are, you know, in the public interest and do meet the goal. So I think the Commission is asking that, you know, that same question.

On the timing question of will it shorten the process. I really do labor over this. I wish that, you know, sometimes I wish that it were, you know, we were in British Columbia and the utility was the government and was the policy maker and they write the contract and they say, that's the contract. And then when it's approved --

ASSOCIATE MEMBER GEESMAN: I thought that's the way it worked here.

(Laughter).

MR. DeROSA: Let's see, which one is the

decision-maker on that one?

ASSOCIATE MEMBER GEESMAN: The utility, I'm sorry.

MR. DeROSA: But, you know, they say okay, here's the contracts, you know. You bid to it and if you win, sign the contract. You know, we tried to create a standard contract a couple of years ago and, you know, Steven's estimate of that time, that time frame is correct, you know, from the announcement of the RFO to final approval. It is, you know, typically over a year.

I think it would take a long time to come together to get a standard offer contract among the parties. And with the market changing as it is -- You know, when we wrote this contract a couple of years ago MRTU was still MDO-2 and, you know, no inkling of what that meant. So that timing question is -- I mean, I don't have -- I struggle with that, I don't have an answer for it.

MS. DOUGHMAN: Stu, is it okay if Lad jumps in?

MR. LORENZ: Can I just make a quick comment? My concern is that a feed-in tariff would replace a competitive solicitation to the detriment of customers. So those projects that

are coming in below the market price referents or at a competitive level would disappear as a result of a feed-in tariff.

I agree with you. The problem of the beauty contest for those projects that are above and how do we, you know, how do we take those attractive ones that are above without eliminating the competitive solicitation and the benefits that that's producing for customers I think is the -- you know, that's the dilemma that we're facing.

ASSOCIATE MEMBER GEESMAN: Do you think the competitive process is best focused at the larger projects? To build, for example, on the Edison biomass example, than perhaps for the smaller size. It would be beneficial to have a feed-in mechanism instead.

MR. LORENZ: Well I think there may be an opportunity for feed-in tariffs for small size projects from two perspectives. One is it can increase the diversity. But also those projects have a lot of trouble dealing in that competitive solicitation. That's an expensive, time-consuming and large commitment on their part that some are not willing to make so there may be an opportunity there.

MS. DOUGHMAN: Okay, Stu and then Jonathan.

MR. HEMPHILL: Commissioner Pfannenstiel, you mentioned two questions. One was on SEPs and the other was on the timing it takes for renewable solicitations. Let me first mention that yes, I have spoken with many developers about, about SEPs. And they, you know, come back and say, I'm sure they have spoken with you also to say that they aren't financeable.

And when I take a look and I read through the documentation it's understandable. There is no durability necessarily in the funds and that is really, I think, the downfall in the SEP program. I don't have any solution for you on that one but I wanted to at least confirm that I have heard the same things that you have.

Regarding timing. I have not had the same experiences as some of my colleagues here regarding the process for some contracts. Some of my, some of the contracts that we have been able to put together with our counter-parties have required very little time. They have been able to accept the pro forma largely intact with small modifications and we have expediently received

approval from the PUC. They tend to be the smaller ones, they tend to be the smaller ones.

The large scale are more complicated. The 1500 megawatt wind deal, you know, the largest wind deal in the country, and my counter-parties say in the world so whatever. That's necessarily complicated. They don't even have any transmission. And those ones are going to take time and they don't, they are not very conducive to a standard offer contract because they need the flexibility. And that's what we find with many of our counter-parties is they want a customized deal in order to take into account whatever special considerations they have regarding their project.

MS. DOUGHMAN: Okay, Jonathan.

DR. LESSER: I have been listening patiently here, bemused. I think that the approach we recommended, A, is not a replacement for the renewable portfolio standards. It could be if that's what the policy decision is. We really (indiscernible) a lot of the policy considerations of what kind of renewables, what quantities of renewables have landed off the table as outside of the scope of what we looked at.

All we are suggesting is that if you

want to develop or accelerate development of renewables technologies that are above market that you take an approach that minimizes regulatory procedure such as setting payment prices, setting how fast payments decline over time. Setting a market price that, say an RPS, a standard offer contract price.

I think the more you can avoid that, those sorts of things, the less problem, the fewer problems you'll have achieving your policy goals. Because it will be more efficient to achieve them by letting the developers themselves establish the prices through competitive auction mechanisms. And since that is going to be done by the CAISO to me it just seems pretty straightforward to use that sort of approach. Then you just don't have to worry about a lot of these questions that are coming up.

MS. DOUGHMAN: Okay, can we move on to the next two questions?

All right, questions three and four.

Number three: In support of meeting the goal of 33 percent by 2020, what lessons from feed-in tariffs in Europe should be applied to development of feed-in tariffs in California?

What lessons, if any, from California's experience with standard offer contracts should be applied?

Number four: What are the mechanics for determining the appropriate tariff(s)?

How would the tariff level or levels be determined? What are the relevant data points?

Is a single tariff for all renewable technologies appropriate or should there be distinct tariff levels for individual technologies, project sizes, geographical areas, for example, based on the quality of the wind resource, or other factors?

Should tariffs be specific to renewable facilities or technologies within California, or should they be determined comprehensively based on national and international data and experience?

How and on what schedule should the tariffs be updated? Is there enough flexibility in the state regulatory process to allow for updates in a timely way?

Paul, do you want to start?

MR. GIPE: Pam, just a question to begin with. Was I supposed to comment on question one and two as well?

MS. DOUGHMAN: If you'd like, it's on a

raise your hand basis.

MR. GIPE: Okay, well I'm sorry, I wasn't quite familiar with the process. But let me answer question one and two first of all.

I would suggest at question one that we do need to create a renewable energy feed-in tariff in California. I'd suggest a California Renewable Energy Sources Act be the approach that we take.

To question two, is there anything new. In case people here aren't aware of it Germany installed 1100 megawatts of photovoltaics last year. I have been out of the country for awhile. How many megawatts of wind were installed in California last year? I've kind of lost track. Two, 300, 400 megawatts, 500.

ASSOCIATE MEMBER GEESMAN: Since our program went into effect in late 2002 a total of all renewable technologies installed, minus PV, is 248.

MR. GIPE: Thank you.

MR. HEMPHILL: But now Germany is up to the same level as California in terms of percentage so you have to look at where you're starting from as well as what the incremental.

ASSOCIATE MEMBER GEESMAN: And ignore the argument about resting on your laurels or any of those other things.

MR. GIPE: I might add that I came to California in 1984 to work on the wind farms in Tehachapi. And if I remember correctly we installed 1500 megawatts in 1984 through 1987 and that's been pretty much what we've had since then.

ADVISOR TUTT: Okay, is this is to what has been happening in Germany and Spain regarding transmission constraints on those renewables that they have installed?

MR. GIPE: In the case of Germany they now have 20,000 megawatts and the question is how do they invest in improving the transmission system. What kind of transmission system do they want to invest in. Is it going to be a transmission system like was built in the past or is it going to be a transmission system that is collecting these very diverse, renewable sources of generation. So that's the question that the Germans are asking today.

And I am not familiar enough with Spain to comment on Spain. But Spain I think about ten percent of their electricity supply is coming from

renewables as well.

And in terms of question number three in support of meeting the goal of 33 percent. Well I just don't think you're going to be able to do it unless you have some kind of feed-in program to reach that kind of growth. I just don't see how it's going to be done in California to reach that level if the state is committed to meeting that kind of target.

What are the mechanics for determining an appropriate tariff? Well the way the Germans, the French and the Spanish do it is basically gets together in a room and they fight it out. They have the technologists, they have the developers, they have the electric utility industry. And they all through a very transparent process -- It eventually moves into the political arena. But it begins with a very transparent process.

Everybody says, what are the costs, what kind of profits do you think are acceptable under these kinds of conditions. In the case of wind if you're putting a wind turbine in an area that has less wind resources than say a place along the coast or a windy place like the Tehachapi Pass.

So everybody kind of hammers out what

are the acceptable tariffs. Then it goes into the political process. And if it comes out the way they proposed, that's good. Sometimes it doesn't but that's the political process. So ultimately the parliament speaks or the people speak through their parliamentarians.

Is a single tariff for all renewable technologies appropriate? No, it's certainly not. We have to have the differentiation, I made that case earlier. Should the tariffs be specific to renewable energy facilities or technologies? I think in the case of you're looking at the cost to develop in California, what are the costs here? The costs in California might be higher or lower than in Germany.

For example right now the cost of installing photovoltaics in California are about 20 percent higher than in Germany. So the Germans can do photovoltaics a lot cheaper than we can do it here so our cost for developing photovoltaics is going to naturally be higher as a result. But we get better sun so those are the kind of calculations you need to take into account. We have better yield but our costs are higher.

And on what schedule should the tariffs

be updated? Well two to three years. The Ontario program is two years, the Germans have now gone to a three year system as have the French.

And I just wanted to make a comment about the federal tax credits. The program that I'd like to see, in Michigan for example, incorporates whether there is a federal subsidy. Whether there's a PTC -- whether there is a federal subsidy. So if the federal subsidy goes away you get the full tariff. If the federal subsidy is there it is proportional to how much of the federal subsidy you're using.

Because one of the problems with the PTC in the case of wind energy is if you don't have the tax appetite you can't use the PTC. The Canadian system is more egalitarian. It's simply a payment of a cent per kilowatt hour. So it is not a tax credit or a tax deduction, it is simply a payment, it is more egalitarian. But at least in the American system if you don't have a tax appetite you can't take advantage of it.

And in comment to Lad's statement about the law on privileging wind turbines in the rural landscape of Germany. That actually came into effect in the mid-90s. It was substantial.

And I agree with Lad that renewable energy feed-in tariffs are no panacea. It has to be part of a comprehensive set of policies. It's just one element but it's of course a critical element. Because the two things that you need most of all are you need access to the grid or contracts for selling your electricity to the grid. But the second thing is you need the price. You have to know the price so you can finance it and so you can make a reasonable, a reasonable decision on making a very capital-intensive investment.

And that's it, thank you.

MS. DOUGHMAN: Okay. Wilson, did you want to add something?

MR. RICKERSON: Just very briefly. I thought it was interesting what Stu, I think it was Stu, was saying that maybe feed-in tariffs for smaller resources and competitive solicitations for the larger, a kind of hybrid program. I think just in competitive, I think competitive solicitations --

Just limiting my comments to the experience in Europe now. We had them in, you know, Britain with the NFFO law. They also had

them in France and in Ireland. And then Denmark switched from a feed-in tariff to a competitive solicitation and its market abruptly stopped.

Meanwhile the competitive solicitations in the UK, Ireland and France, while they did generate some capacity there were high rate of contract failure and the Germans are putting them to shame with their open-ended feed-in tariffs. So eventually, you know, that's why we had competitive solicitations off the table throughout Europe by 2002 or something like that.

MR. CLEIJNE: We will have them.

MR. RICKERSON: You'll have them? Okay. I didn't know that. But I think there is a way to kind of think about different tools for different resource slots.

MS. DOUGHMAN: Hans, go ahead.

MR. CLEIJNE: Yeah, maybe. Looking at France, for instance, that's -- I think you were making the distinction between small and large. And what happened in France was that they had a limit, which was 12 megawatts. So there was no development of over 12 megawatts.

I know that the levels of, let's say renewable energy systems in the US are most of the

time larger than in Europe but there was quite a lot of development, say up to 10, and that was the feed-in tariff, and above 12 nothing happened. And that's the reason that they skipped that and now they have also a feed-in tariff for the larger.

For Ireland, Ireland had the same, they had an open-source station on the tariff. So what they actually auctioned was the tariff. And then I think last year they decided to abandon that because they thought that the progress rate wasn't fast enough. And they were worried about an infringement process, it's called an infringement process by the EU. If you do not, if you do not get to your targets in time then you will be prosecuted by the EU. So they didn't want to do that and they abandoned the open-source station and went into a feed-in.

What kind of other -- I had just written down a few comments because some of the issues are not really -- there's been discussion about grid access as opposed to feed-in tariffs and last, at a conference last week there was this argument about harmonization processes, harmonization of feed-in tariffs. And they said well actually you

have really four requirements and I've written them down.

One is good administrative procedures and legislation for planning and permitting. The second one is grid building and grid conditions and also the legislation connected to that. Public acceptance and a payment mechanism. And it was left open whether that should be a certificate process or a feed-in process that can attract investments. If either one out of four is missing then probably your system is not going to work.

So in a sense feed-in. And I think that is also how it is looked upon in Europe nowadays. It is an instrument and it is an instrument to reach your goals. But you can make a certificate system, you can design it in such a way that it almost resembles a feed-in system and the other way around. And if you're talking about power limits or budget limits or certificates then you almost, you almost will have a feed-in system. That is, don't get into that too far and make sure that the other requirements are also in place.

With respect to the quality of electricity. I think some of you mentioned quality of electricity. I think, well, as you see

in Germany, that is indeed taken care of by a grid access cost or the Einspeisungsgesetz, the law for feed-in.

And looking at say Spain and the Netherlands, there you have this premium system which requires an electricity contract to be underneath, to be part of the deal. So you have the generic calculations for what an electricity contract will be like and that means that you have to take into account, say, how much do I pay for imbalance of wind? What are my grid access costs. But those are generic costs.

On the other hand you have your electricity contract and that's really a separate deal. You can see that also brings in a difficulty for finding what the exact feed-in premiums are but it takes care of the quality and also the value of renewable electricity.

So if you are going to put in wind power into the electricity system then as a generator you have to take care that you have, that you have good forecasts. If you don't have good forecasts that will deteriorate the value of your electricity. So that is a mechanism in a way that you can, well, take care of the value of renewable

electricity, while on the other hand have a sort of stable subsidy system.

MS. DOUGHMAN: Stu?

MR. HEMPHILL: I know this isn't exactly where the question was headed but I couldn't help but point out the elephant in the room here. One of the big challenges in meeting 20 percent is a lack of transmission access and going to 33 percent is certainly going to require more.

When we designed the Tehachapi transmission project it's designed with the intent of bringing wind on it so it has specific equipment necessary to provide reliable service knowing that you're going to have wind on the other side. I think that is getting to the transmission that was brought up earlier and I think that's probably what has to get done.

As the Commission has noticed, has noted itself, we have a pretty good idea about where those renewables are and they are where people aren't, unfortunately, and so it's going to require more transmission. That's one, step one. If we're going to go beyond 20 percent it's certainly critical that more transmission be built.

Step two is we've got to fix the interconnection process. Every time I talk to the people doing interconnection the amount in the queue is growing exponentially and last time I spoke it's at 33,000 megawatts in California. It was at 2,000 when we started out and it's just a problem that has yet to be solved. That is going to require some, some joint work between all of us at FERC to help fix, I think, and I'm happy to help however I can.

ASSOCIATE MEMBER GEESMAN: Let me, let me take you up on your offer and also extend it to each of the other two companies. And that is, if you could provide us in this docket with information on the queue and any recommendations that you may have for trying to clear that logjam it would be greatly appreciated.

MR. HEMPHILL: I'm happy to do that. My recommendations will be more procedural than anything else.

ASSOCIATE MEMBER GEESMAN: That would be fine.

MR. HEMPHILL: Because you need to have CAISO there, you need to have the generators there. I think that there is something that we

all can do together because we all see it as problematic.

ASSOCIATE MEMBER GEESMAN: That would be fine. You know, in the past it is not instantaneous but we have had a pretty good track record of persuading the CAISO of the wisdom of some of our recommendations. So I think they're a necessary party on this, obviously.

MR. HEMPHILL: Absolutely they are. And we need their help to help facilitate discussions with FERC to change policy there.

ASSOCIATE MEMBER GEESMAN: Absolutely. I think FERC is potentially quite receptive right now. In the past we have been fairly successful in persuading FERC of the importance of trying to address renewables in their transmission policy.

I'd expand your remarks, or at least I'd assume that they also apply to transmission throughout the West because I note that your company is exploring transmission opportunities to develop renewable resources, particularly geothermal, in Nevada as well.

MR. HEMPHILL: I certainly --

ASSOCIATE MEMBER GEESMAN: And PG&E is going up to the Northwest.

MR. HEMPHILL: I certainly support it. Under the current rules in California I'm clearly focused on making sure we have sufficient transmission in California. I would love to see the opening up of the market to the western states to meet everybody's renewable solicitation. One way to assure it is to increase supply and make sure that we have, that everybody has enough renewables in California.

ASSOCIATE MEMBER GEESMAN: And I think this 33 percent target needs to be understood in the proper context. You know when that was originally formulated it wasn't so much intended as an expansion of our program but rather a continuation of the current trajectory of development that would get us to 20 percent in the year 2010.

We have tried to graphically display that in several of our reports, understanding that one picture is worth a couple of hundred thousand words, to illustrate that from the outset of the RPS program to achieve a 20 percent target in 2010 and continue on that same slope would carry you to 33 percent in the year 2020.

I think our effort has been to emphasize

we ought to continue with the same level of urgency and dedication that has characterized state policy the last several years. We also have always been pretty careful to define that as not restricted only to California resources but expanding throughout the western interconnect. As you know the WREGIS program has been designed from the very outset to contemplate a westwide renewables market.

MR. HEMPHILL: That sounds good if we can just get transmission to go up at one percent per year we'll be in good shape.

MS. DOUGHMAN: Frank.

MR. DeROSA: On transmission and this chestnut of the interconnection queue. There is an opportunity now to maybe make some ground on that. The Public Utility Commission just issued I think last week a proposed resolution I think to Stuart's, to Edison's transmission plan. And they have put in I think some very interesting ideas. Analysis of competitive renewable energy zones and this idea of maybe looking at an open season type process.

And recognizing, I think the resolution does recognize that the ISO has to be involved

because the ultimate formula or the ultimate solution will have to be consistent with the FERC regulated interconnection queue. But on this queue, you know, the whole issue is what are the, you know, what are the milestones and how can -- how can we proceed without having, you know, the first 15,000 megawatts in the queue clog up the queue, whether they are going to happen or not.

And so I thought this draft resolution created a good forum to, you know, actually, you know, get some, put some teeth into that.

ASSOCIATE MEMBER GEESMAN: Good. We are also addressing at our business meeting on Wednesday a planning contract wit CEERT that is intended to be a companion to the Edison advice letter.

MR. DeROSA: Can I go back to questions three and four? Just real, real briefly. I'll add on that I think this distinction between big and small has merit and PG&E does have a standard offer contract, an actual standard offer contract, for both renewable and cogeneration projects of a megawatt or less. So that's an approved contract that is out there. So, you know, we set that big/small at one megawatt. You know, it may be worth

looking at a different size but I think that distinction has merit.

Our reaction to a true feed-in tariff of the European kind is that it seems like an awful lot of rules. Rules, there's a lot of smart people out there and they'll figure out how to game them and we have had a lot of experience with that in California. So I would second Jonathan's comments about try to, you know, try to keep it simple.

And the last point would be that I think you're hearing all three of the utilities react very strongly to the price. You know, I would say, you know, we think the competitive process works. If there is -- If we are not going to hit 20 percent by 2010 it's not because of the competitive process per se. And I would ask, you know, why pay somebody a lot more when they're willing to sell to you at, you know, some lower price. So I would leave, leave you with that thought on questions three and four.

MS. DOUGHMAN: Steven.

MR. KELLY: Yeah, one observation regarding the European experience that I thought was intriguing that I hadn't heard until this

morning was -- And I'm not taking a position on it but it's something to consider is this notion that you're paying, it sounded like they were paying a little more for less efficient generation if it was in the interior to spread the generation around the geographic grid, as it were. Presumably getting some transmission benefits out of that. But you're certainly getting the dispersion of resources. I don't know whether that is good or bad but I thought it was one thing that was kind of intriguing that I've heard this morning. So that's one issue that might be looked at further.

In terms of the mechanics for determining the appropriate tariffs, one mechanism for figuring out where the tariff level might be is to just simply take the experience from the existing RFOs that occur in California and nationally or internationally and use that as a barometer of what the individual distinct technologies might need to be, to get interconnected in a timely manner.

It's fairly clear to me, at least now, that we're moving into an increasingly global economy for the technologies behind some of these

resources, particularly the wind and solar. And in that global economy you're finding that the physical attributes, the turbines, the solar shields or whatever, are moving around the world.

And you need to take that into consideration I think when you design and consider these tariffs in order to attract the infrastructure that you need to get here. So I do think that it is probably appropriate to be looking at distinct tariffs if you're going to look at them either on a product basis or a technology basis, whichever you think is most important.

And because of this global economy I don't, you need to be somewhat California-specific because California is a very difficult state to site and permit resources and everybody knows that. Our costs are just high compared to other states in the West, for example. So it wouldn't probably be right to just take what the cost of installed wind capacity in Wyoming and presume that you can do the same here. So you need to tailor it, relate to that kind of information.

I think I would update these tariffs every couple years. Probably two years. Because

my impression is that the price of the steel, as it were, behind these various technologies is escalating very rapidly. And that you'll quickly find yourself potentially out of the money if you set a tariff that is tailored to numbers from two years ago. Right now --

As I said, because of this global push you are seeing upward pressure on steel prices for turbines and everything. You know, maybe that will turn and it will go downward but right ow it seems to be going up and you don't want to be caught in a situation where you have just spent a couple of years working on these tariffs and come out with a price that still doesn't meet the terms of being able to invest.

So I would recommend a more repeated review of those tariff levels to get the amount of resources that you want at the places that you want them. So those are my comments.

MS. DOUGHMAN: Lad.

MR. LORENZ: Just a couple of comments. Hans, I really appreciated your putting sort of this feed-in tariff in context, you know, with the other four elements. That we are going to need transmission, regulatory environment, interconnect

and some of the others that, you know, this is just one element of it.

But it does seem to me that in the descriptions that we heard earlier today that those feed-in tariffs are complicated. I mean, we're talking, you know, technologies, size, geographic distribution. We're talking a plethora of tariffs that, you know, have to be developed either across the three utilities or, you know, one for the state. The bigger the process the more complicated it is going to be.

The one question I had asked Paul is, how long did it take for this negotiation process first to take place and then for the approval process in the political arena to take place? And what happened to renewable development during that process, during -- If we were going to make that kind of transition what kind of impact would that have on continuous development. It seems to me it could have a fairly detrimental impact.

MR. GIPE: The original feed-in law was passed in 1991 and when they revised it in 2000 it was actually, the tariffs were determined in a matter of months. In 2004 it's the same case. Currently it's being discussed right now, all the

preparatory work had been done by the technical bodies, the consultants, and then it moves to the political arena because that is where the decision is ultimately made in Germany. In France it's much more complicated. It takes a little bit longer but it was done within a year.

So typically the tariffs are modified every two to three years as we mentioned. The discussions begin as soon as you're finished with one. The consultants are hired about six months. The consultants are typically hired about six months to year before the actual tariff is to go into effect.

And just to make sure that everybody understands when we talk about changing the tariffs it's the tariff for the next new project. The existing projects the tariff is fixed for the 20 years of the contract. The tariffs, of course, can go up or go down. Typically they have been going down but they can go up as well.

MS. DOUGHMAN: Okay, does anyone want to add anything more to questions three and four? Jonathan, did you want to add any more? We're going to give Jonathan a microphone so he can --

DR. LESSER: I guess in regard to

question three the lesson for California I think would be to, again, you can avoid having to go through the difficulty of establishing the tariffs themselves by letting the developers do that through a market-based system, even though there is a history in California of standard offer contracts. Some of the problems with that, granted it's not clear that you would produce that renewable technology.

I suggest that the market-based approach, very open with an auction, would avoid this whole issue. In fact that makes question four irrelevant. You don't have to worry about the mechanics of setting the appropriate tariffs at all.

You do have to think about what sort of overall quantity goal we want for different renewables and decide what the source of auctions, how you will differentiate the technologies. It's obviously an issue. And you will have to deal with some of the engineering issues such as these utility folks have mentioned, the transmission interconnection. That is clearly going to be a big issue. But that is being dealt with in the capacity market. And I would recommend that you

just leverage off that CAISO process and not try to recreate the wheel.

MS. DOUGHMAN: Okay, thank you. Anyone else on the panel have anything more to add?

Okay, I think now it's time to open up for public comment. Do we have blue cards?

PRESIDING MEMBER PFANNENSTIEL: I do, I have one that has been given to me.

I want to thank the panel, I think this was very useful. Thank you for your patience with all the discussion.

I do have a blue card from a John O'Donnell. Why don't you stand at the podium and use that microphone. Make sure the green light is actually on.

MR. O'DONNELL: There is no green light on at the moment. Is there a means of adjusting it?

PRESIDING MEMBER PFANNENSTIEL: Bill, would you --

MR. O'DONNELL: There it is, okay.

Thank you for letting me speak for a moment. My name is John O'Donnell, I am president of Ausra. We are a solar power development company. We are bringing technology that was

originally developed in Australia, a new optical system that is lower cost than some of the existing parabolic trough and other systems, to large scale here in the United States.

Khosla Ventures and Kleiner Perkins are our investors and we have been actively looking at opportunities around the US, around the Southwest, with an eye to first power projects within the next two years. When we look at -- And our team includes quite a number of Australians who moved over from the research team and a number of guys from the mainstream, independent power producer industry in the US.

And when we look at this moment in history right now we look at not only the next five years but the next ten years. Not only the 2010, 2020, both targets. And we see an ecosystem that has to work. We need collaboration from both of the utilities and other developers of transmission in building the corridors to the places where the resources are lowest cost. We need land development to permitted scale.

One of the big challenges is if we have a fixed high-price feed-in tariff it may be strategically less advantageous for the utilities

to strongly build those transmission corridors because it will significantly drive up their power mix. So we would much rather see market power in the hands of the utilities where they have the power to negotiate and choose the best technology and the responsibility to do so.

They are clearly delineated so that there is an RPS mechanism that specifies how much we're going to go for and we let the market choose the lowest cost technologies, the technologies that the guys who know the most about the business choose.

I spent a lot of my career in the computer industry and observed sectors of the industry that were heavily, that were serving heavily tariffed markets, and I would note in particular telecommunications and other areas of the electronics that were serving less-regulated, more subject to market forces. And if that experience is of any value whatever, establishing a feed-in tariff will --

I'm sorry, my first argument was that establishing a high tariff is likely to slow down the construction of some of the later phases. It may speed things up a little bit at the beginning

but it will actually make it more difficult to achieve the 20 and 33 percent.

The second is that if we look just at these market forces the tariff will tend to be established for the most expensive technology or the oldest technology because that's the one that's the best understood. And as a result those prices will persist longer and there will be less pressure on the industry to come down in cost.

If we look at the experience in the wind business what happened was that wind reached a point where enough manufacturing capacity was in place, they came down a learning curve.

And we believe that we're on the threshold of that in the solar business where companies coming down the learning curve simply getting first deployments under way will result in substantially lower costs. We in California can benefit from some of the high tariffs that exist today in Spain and elsewhere where some big industrial giants are deploying at scale and benefit from lower costs here and allow a competitive market to develop here. So I think --

I strongly echo what I heard Frank and Stuart and Jonathan mention that we strongly

believe that market forces can carry us to the targets that we want and are likely to do so at lower costs to consumers and potentially at a higher velocity than the establishment of a tariff. Thanks.

PRESIDING MEMBER PFANNENSTIEL: Thank you. John White from CEERT.

MR. WHITE: Thank you, Madam Chair, Commissioner Geesman. I'm John White with the Center for Energy Efficiency and Renewable Technologies and I am going to preface my remarks by saying I think I better speak on my own behalf today because given the discussion this morning and the conference calls and email that's been flowing within our organization I don't have a clear consensus position on the subject to recommend.

But I do -- First of all I want to thank the Commission for having the conversation because I think looking at what the experience has been, where in my opinion they seem to have achieved more results than we have, it's worth looking at. On the other hand when I actually try to apply this idea to our current circumstances and our political and stakeholder process I can easily see

lots of disadvantages.

And so what I'd like to think about is maybe what are the reasons that we'd be having this conversation and what are the attributes that a feed-in tariff has that we might try to apply to our current circumstances.

First of all I think we sort of have a feed-in tariff for PV. And in fact the solar initiative that the Governor and the Legislature and this Commission and the PUC all worked together to put forth was basically based on the idea of creating a certain amount of certainty over time. A ten year window upon which people could rely and then having a high enough tariff set that would then decline that we could begin to increase volume and lower costs.

I don't know whether we'll get there. There has been, unfortunately, a great amount of resistance to the idea of performance-based incentive, which is one of the key attributes of the European system. So I hope that we don't lose that and try to do things like estimated performance and testing of devices as opposed to real world metered results, which I think is very important.

The second thing is I think it's fair to say that in California we have worried more about how much the renewables cost than we have about not having them installed. We have sort of a belts and suspenders system here to be sure that we're not paying more than the market price, even though it's really -- the idea that this is a market-based system is to me a torturous application of the words.

We don't have a system for comparing resources together because utilities had to guarantee cost recovery for natural gas. And as long as that is the case then the risk of not buying enough renewables isn't on them, it's on their customers.

So in California we have basically worried about paying too much and as a result we haven't installed very much renewables recently.

On the other hand we are still trying to understand how we're going to be doing in terms of contract failure. There are many aspects of that. Some are bad projects with bad developers it seems to me. Some also there's problems with the permitting process.

So I think the good thing about this

discussion is what we can do between now and 2010 to alter the RPS is probably at the margins and probably we ought to just keep at it and keep working at it and anticipate that there is in fact some shifting of at least public sentiment in favor of a more impatient attitude towards getting the renewables on-line.

Secondly I think the attribute of the RPS that we have today is that we are not getting participation from all of the technologies that we want in our future portfolio. And this comes about perhaps because some of the technologies such as concentrating solar seem to be outside the band of the current range in which most of the RPS projects are falling.

Wind on the other hand seems to be close enough for JES in terms of the current MPR but there are other issues such as transmission access, permitting and so forth. But wind looks like, particularly if we get RECs up and running, which we hope this Commission will help us do and has a broad ability to move energy and RECs around the system and not have it be artificially constrained, that should help wind and I don't think wind necessarily needs a feed-in tariff.

Where the PUC has been looking at the feed-in tariff and the utilities have commented somewhat favorably on is in the AB 1969 category of the wastewater treatment projects that are small projects, a megawatt and a half or below, that appear to be sort of in the more solar category of having some direct incentive that doesn't require extensive negotiations.

Geothermal and concentrating solar are the technologies where the participation has been much less than we would like. And I think in both cases there are some attributes of the feed-in tariff that are appealing but there may be some attributes to the current system that can be adjusted.

For example, as Steven Kelly mentioned the idea of the AB 57 process of allowing individual projects to be negotiated with the utilities and brought forward to the Commission for approval. I find it hard to imagine that we are going to give that system up.

That the utilities are going to end up agreeing to a process that they basically automatically get projects without the opportunity to negotiate with them. On the other hand if we

were to see a substantial amount of projects brought forward under, in the categories that we need then perhaps that process could work.

But I think when you look at concentrating solar it seems that you've got a couple of problems to try to overcome. One is that the attributes of this technology seem to be such that we would want it to be participating in our resource portfolios. And the fact that we are not getting these technologies to participate in a meaningful way and in a way that we believe is going to result in megawatts on-line tells us we maybe better take a closer look at the attributes that we are seeking from our renewable projects.

I heard the word externalities mentioned recently again and that I think suggests a place we're going to have to go with the current RPS. The idea that the market price referent captures all of the value that renewables bring to the system I think is probably not the case. The fact that AB 32 may provide another compartment into which we can extend ourselves and negotiate doesn't give me necessarily all the comfort.

So I think we have to basically take a harder look at having attributes that technologies

that we want in our portfolio have to be represented somehow in the criteria that are chosen. That could be in the form of a better recognition of peaking, it could be in the form of allowing negotiated contracts above market.

But this gets to the second part of the problem with CSP. And really we have been focusing on CSP as the place where you might want to look at a feed-in tariff and yet have not reached a clear internal consensus about that. But this is the idea of the need to get to scale, the need to get bigger projects than the 50 or 100 megawatt size projects that we have typically been seeing in the RPS.

And how we would do that I think leads us back to the Commission's advice letter in some ways. That what we're basically going to need to get these technologies built is coordinated procurement and transmission done based on where the resources are and the idea of building them out.

Now if some of those resources are more expensive than the MPR and we can see a path to get the cost down there would be some virtue in having a limited time phase process where you

might accept some offers in the context of the feed-in tariff.

But by the time you end up arguing and negotiating what the feed-in tariff would be, and then the interconnection terms and conditions that the feed-in tariff would require, I'm not sure that we're not maybe ending up talking about making adjustments in the way we do the RPS as sort of the functional equivalent of that. Provided we get everybody not to sue each other and go to federal court and argue that PURPA doesn't allow us to pay more than avoided costs, whatever that is.

So I think what we need more than anything is a vision. We need some degree of consensus that we're going to do this scale of renewable development in those places, and then figure out the best way to go about it. I think that the European experience has much to offer because of their results.

I think in our case, you know, we're going to have a hard time enduring a process change of the scale that the European experience would require us to do. But I think this discussion that you're having and this opportunity

for people to try on different ideas is a good first step but I think the key is how do we get better results than what we now have.

And I think it seems to be maybe to borrow in part from some of these other experiences at least the attributes that are present and then understand that California is nothing if not about process and see if we can figure out a way to use some vision to drive us towards a bigger consensus that allow us to be expeditious and move forward.

Those are some of the thoughts that occurred to me listening to you. I thank you for your attention and thank you for having this meeting. I'd like to answer any questions if you have them.

ASSOCIATE MEMBER GEESMAN: John, I think the way we had framed the question was for a post-2010 RPS environment. So even by the legendary standards of the BPRU we'd probably allowed enough process time between now and then to throttle each other several times over.

(Laughter).

MR. RICKERSON: I doubt it.

ASSOCIATE MEMBER GEESMAN: I think that

two of the three utilities would say that the utility scale solar program, the existing RPS structure is a roaring success because they have both contracted for the same technology. One which arguably scales quite well and one which has come in below the market price referent.

So from, I suspect, their perspective, what has been called earlier today, I think mistakenly, a competitive process or competitive forces or market forces have actually produced solar technology that would scale and still come in below the market price referent.

MR. WHITE: I think it's produced --

ASSOCIATE MEMBER GEESMAN: What's the matter with that picture?

MR. WHITE: I think it's produced a power point of how that might happen. And frankly I hope it's so. But I don't know anybody outside of the utilities that shares that view. And in fact part of what I'm suggesting that we do is to own up to what these technologies are likely going to cost to get them on line.

The criteria that I look at for successful concentrating solar projects are experience and capacity to manufacture on a large

scale. Second is experience and capacity to construct and engineer projects on a large scale. And third is the ability to finance with existing instruments, projects that have cost hundreds of millions of dollars.

If you have, you know, those three attributes I think you've got a chance to produce something real. If you don't I think, you know, what you end up having is sort of development projects that end up being done in the name of the RPS but don't end up having the same results.

So the attractiveness about the feed-in tariff is that it basically requires us to admit that to get the renewables we want we're going to have to pay more for them than we would like. And the goal of the discussion is to figure out how do we get the costs down or is it still worth having. In order to survive any kind of a PURPA challenge you're going to have to establish the value of these technologies to the rate payers in terms beyond just that I want them.

So I think to some extent we are going to be stuck if we -- if the utilities are proved right and I am proved wrong and we have this wonderful technology that comes in below the

market price referent perhaps this will all turn out to be irrelevant. But in the case that they're wrong and it doesn't work as well as projected I think we need to have something else in place which is why I think this discussion is very much worth having.

ASSOCIATE MEMBER GEESMAN: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you, John.

ASSOCIATE MEMBER GEESMAN: Madam Chair, I'm afraid I have to excuse myself due to a prior commitment.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Commissioner Geesman.

A blue card from Jane Turnbull of California League of Women Voters.

MS. TURNBULL: Chairman Pfannenstiel, staff, again thank you for putting on this workshop today. I think it has raised a lot of important issues. And I would like to say that probably maybe for the first time I am almost in 100 percent agreement with John White.

One of my concerns is that it sounds as though the goal of this whole effort is to meet the RPS goals, not necessarily to improve the

reliability and reduce our carbon dependence in California. Renewables are part of our resource adequacy planning process and we want to have a reliable system for the long term. So I think, you know, that is really what we're all about.

We want to incent these technologies and get them on-line as quickly as possible but when they're on-line we want them to meet the needs of the power system. So we want the electrons to be flowing at the right time of day, we want them to be certain that they're going to be there next week as well as this week, and we do want them to come in at a reasonable price.

I was very impressed about two weeks ago when you had a workshop on distribution. The whole development of advanced meters is really very exciting. There has been no discussion about dynamic pricing or the use of advanced meters for small systems here today and I think that that really needs to be part of this discussion as well.

The members of the League that I know of who are putting solar on their roof would like very much to be reimbursed for the power that they put back into the grid, at a fair price, whatever

is equitable. The same thing I think should be true for the biogas systems that are out there. Perhaps the distributed generation systems.

But I think we need to look at combined heat and power DG systems. We need to look at these small systems and begin to look at perhaps a capacity pricing, dynamic price structure that might make some sense.

I think the other point that I would like to make is I think that the standard offer approach, certainly for the small systems, is something that should not be neglected. Hopefully it could be for the larger systems as well. The need to separate a system that is 50 megawatts and above from the systems that are, you know, less than 10 megawatts really is very important.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Jane. Tod O'Connor.

MR. O'CONNOR: Thank you, Madam Chair. I'll make my comments brief. My name is Tod O'Connor, I'm president of O'Connor Consulting Services. I have been involved in renewable portfolio standards in California and throughout the West. I have represented solar large and

small, biomass and geothermal. I'd like to address my comments to 4b.

Let me start off by saying that feed-in tariffs can enhance the RPS here in California. There are several other programs it can enhance, especially if you're looking at the discussion between big and small. You can enhance the state's California Solar Initiative.

Not every solar system that goes on a rooftop will be owned by the owner. There are other options out there where you can aggregate rooftops, combine the power, sell it to the grid or have the utility own it. And having a feed-in tariff to enhance that kind of value proposition could be one of the tools this Commission and the Public Utilities Commission ought to take a look at.

I want to amplify Mr. Kelly's proposition in terms of what kind of mechanics you ought to be looking at in terms of the feed-in tariff. This morning we heard about feed-in tariffs should emphasize technology and fuel.

Historically when the California Renewable Portfolio Standard legislation was passed it required the utilities to do an analysis

of their energy needs by product. Product was defined by baseload, by peaking and by as-available. And in doing that the objective was to have a diversified renewable energy portfolio where one technology doesn't capture all the benefits to the detriment of other technologies.

And having it by product rather than by technology itself I think you've captured the same kind of objective. The market price referent isn't one referent. If you take a look at the rulemaking right after the RPS there was a market price referent for each product and that consistent with the state legislative intent of having an RPS focus on baseload, peaking and as available.

And when you -- And I suggest to staff when they go back and pull out the record for the market price referent rulemaking you will see that capacity and energy values were looked at as well as benchmarking off of, for baseload it was combined cycle gas turbines and for peaking it was single cycle gas turbines that were used for peaking purposes. And that I think is helpful when you take a look at big systems.

When you take a look at developing a

feed-in tariff for small you need to take a look at, again, not only the energy and the capacity but the capital investment it requires to accelerate the deployment of small scale solar. And to that degree small scale, clean, renewable energy resources as well.

So I just put those factors out there for your consideration and I thank you for your time.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Any other, anybody else who would like to address comments on this subject?

Well I want to thank --

MR. KNOX: We may have a few on the phone.

PRESIDING MEMBER PFANNENSTIEL: Okay.

MR. KNOX: There's a couple that are not identified so we'll check into that right now.

Is there anyone on the phone lines that would like to make a comment or a question? Speak up now if you would.

Okay, thank you.

PRESIDING MEMBER PFANNENSTIEL: I want to thank the panel and all the presenters today. It was everything we wanted it to be in terms of

thought provoking and controversial and meaty and fact-based.

I also want to thank the staff for pulling this together. I think it was a really useful day.

We'll be adjourned.

(Whereupon, at 3:10 p.m., the Committee workshop was adjourned.)

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CERTIFICATE OF REPORTER

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

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

IN WITNESS WHEREOF, I have hereunto set my hand this 31st day of May, 2007.