

**Western Governors' Association**  
**Plenary III – Transmission Expansion: When, Where, How Much?**  
**Monday, June 30, 2008**

**Transcript of Panel**

**Governor Freudenthal:** Our panelists today are Jeff Sterba, Chair, President, and CEO of PNM Resources; David Sokol, Chairman and CEO Mid-America Energy Holdings Company; Michael Niggli, COO of San Diego Gas and Electric Company; and John Fielder, President of Southern California Edison.

Much of the focus in recent days has been on the cost of gasoline and how much that has gone up. For those of you who are in the utility business that do both gas and electric you know that the price of natural gas to be delivered to your customers both in their homes and in their business is on the way up every bit as fast as gasoline prices, and frankly electricity prices are going to follow very quickly, particularly for those areas that are dependent on to some degree on natural gas-fired generation capacity. So we arrive here today with discussions about climate change in the context of discussions about energy costs which are growing exponentially with or without any attention to the question of climate change. One of the things that the Western Governors' has been committed to for many years are these questions with regard to the expansion of transmission. Most recently in 2004 we developed a clean and diversified energy initiative through the Western Governors which laid out a pretty decent road map and as was said earlier the federal government by and large ignored it.

I think that the first order of business before I turn to the panelists, will be to ask Governor Huntsman to report on the renewable energy zone initiative meeting he hosted on behalf of all of the governors held in Salt Lake City on the 28th of May. I would ask for a report from the soon to be Chairman of the organization, Governor Huntsman.

**Governor Huntsman:** Thank you, Governor Freudenthal. Let me keep it very simple, concise and brief by saying it's working. We had our first gathering of the Western Renewable Energy Zones Steering Committee. Various stakeholders participated including Department of Energy representatives and Western region participants representing state governments as well. I think this is an extraordinary approach to recognizing one of the more important challenges that we face in the West if we're really going to take the whole electrification and renewable energy piece seriously.

So, I think we're off to a very, very good start and I was most encouraged by the level of participation that we had and the dialogue that has ensued. And I think if we wrap everything around a few core themes, we're actually going to see some good results from what we are doing and tying that back into our broader discussion on energy. If we can focus on affordability, if we can focus on energy independence, and if we can focus on emissions as the three primary core themes, I think that will guarantee that our work will be relevant, focused, and on target for our constituencies.

I will tell you that what we're discussing with respect to transmission infrastructure, we have got to get this one right. In Utah we have a first ever renewable portfolio initiative. I don't know how many states now have renewable portfolio initiatives of some kind or another, but I am guessing most states are looking at this. This would have been unheard of in our state just a few short years ago. We now have one and people are taking it very, very seriously and it is in fact ambitious and it is doable so long as we begin to have serious discussions about the whole transmission infrastructure side of the equation. We're finding not surprisingly that many of our resources, whether it's wind or sun or geothermal, are out in the rural areas where not a lot of people live and today we just don't have any infrastructure. So we are going to take this whole energy piece on the renewable side seriously as a state and I suspect every other state represented here would reflect the same feeling, we've got to get the transmission and the infrastructure piece right. And so we're going to be bird-dogging this one to the best of our ability but I would just ask for our presenters to keep the discussion focused on those three core elements because we can't lose sight of what we are trying to do here.

It is the opportunities and infrastructure that allow us ultimately to gain the kind of energy independence we have wanted for some time. I think we can actually see the light at the end of the tunnel because there's so much political pressure from all sides to get it done. Three, we've got to begin to really take seriously the whole "missions" part of the discussion. So I thank our participants for being here and I look forward to entering a world 20, 30, 40 years from now where we are in fact relying more on the Sun and on the wind and on geothermal opportunities and maybe the atom. I think the mix of energy opportunities will be significantly different in the years ahead. We all know it's possible. We all know that this group can be a primary driver in getting us there but we must also be realistic that the infrastructure must be in place in order for us to succeed.

So Mr. Chairman, we are going to continue with WREZ, the Western Renewable Energy Zones, it's off to a great start and I think has a very promising future.

**Governor Freudenthal:** Thank you Governor Huntsman. I would punctuate this question with regard to the renewable energy resource zones and its relationship to transmission. All of the states here have immense opportunities particularly on the wind side, with a number of the states also having tremendous solar resources. I do know that in terms of the wind resource, ours is an energy producing state and the constraint with regard to utilization of wind lies entirely in the question of transmission. We simply do not have the capacity to get it delivered.

People have lots of projects on the drawing board, they've got the land leases put together, they've got the proposition set, they just lack the capacity to move it to market. In that context I wanted to thank all of the CEO leadership here along with others who over the course of last year sent a public letter to the Western Governors Association talking about the complexities related to generation and transmission, emphasis on renewals, questions about what are going to be the ground rules with regard to CO2 management as well as talking about conservation. I would note that your letter to us was

as precise as our letter back to you. We have some serious problems and we are now at a point where hopefully we can begin to talk about the solutions.

So I would ask that in the following order we would first hear from you with regard to the question of generation and then we'll talk about that and then we will subsequently discuss questions related to transmission. Jeff Sterba will go first, John Fielder is second, David Sokol and then Michael Niggli.

Please gentleman, proceed.

**Jeff Sterba:** Thank you very much governor and let me start first by thanking you. So many times we find policies or visions that are developed but are not executed and the effort that the Western Governors Association is taking to implement the start of that vision which started four years ago in Albuquerque with the clean and diversified energy initiative is very important and substantive, so having a vision that includes execution is really a critical thing for all of us in the west. I have been asked to provide some broader overview comments relative to the generation side because while we can think of generation and transmission as two components of an electric system, they must be integrated because you can't really do one well without the other and minimize cost.

If you think about the challenge that the four of us face and all of our fellow CEOs, it is really a pretty significant challenge and it's only getting bigger. We've got three things and I think Governor Huntsman you addressed them very well. We have to transition to clean energy technology quickly. We've done a good job in reducing pollutants--40% less emissions than existed 25 years ago--but this industry is responsible for 33% of all greenhouse gases. That's got to be addressed.

Second, we have got to develop new methods to ensure a different kind of reliability for customers. The notion that lights don't go out isn't sufficient. Blinking clocks aren't sufficient. There is a whole new standard as a digitized economy that we have to prepare for. And third to maintain affordability and I think we are going to have to create a new definition of what affordability means in a rising energy cost environment.

The first thing is when we think about how are we going to provide this integrated service, we have to think about what does that future look like. In the west, demand for electricity is growing up 1.5 to 2 times the national average. That means by 2030, we need over 100 gigawatts, or 100,000 megawatts, of new resources to meet that load. Or put it another way, over 35% of the resources that we will need in 2030 don't exist yet. That's both the challenge and really an opportunity. We've have got to insure that they come increasingly from zero or very low emission resources and that frames a huge challenge.

This is a graph that I think a number of you have seen, it's in the packet in front of the governors but it's on the slides behind which is a graph developed by EPRI that really looks at what can be done to reduce the carbon footprint or what has to be done from a technology side to reduce the carbon footprint of our industry. And I think there are two

quick takeaways. The first one is, there is no silver bullet. We've got to exercise a number of different things. And the second is that there are some which have more of a nearer-term impact than others, and the two I want to touch on are energy efficiency and renewables.

On the energy efficiency front, my personal belief is that of the 106,000 megawatts we need for the future, 40 to 50% of that may be reachable through energy efficiency alone. That would mean about 30% of the entire demand could be being served by energy efficiency. That's a very significant and aggressive undertaking but frankly with the right kinds of policies that you all have responsibility for that can be achieved.

The second one is on the renewables front here and the one that I want to spend a little bit more time on. By 2025, under the existing renewable portfolio standards that you all have enacted, we need to add 25 gigawatts or 25,000 megawatts, of new renewable energy. Not out of existing resources but new. So when we take energy efficiency and renewable portfolio requirements we could be talking of 60 to 70% of the entire challenge that we face on the generation side. Of that 25,000 gigawatts, certainly wind is viewed as a major lower cost source and solar is increasingly viewed as a potential source.

In the West, we are blessed we have the richest wind and solar resources, but the challenge is that to increase their significant use is an issue of both location and economics. If you look at the chart that I now flip to, what you will see on the wind side are those wind resources that are rated at 5 to 7 and that it's important to know where those are because if you look at the difference between say a four or five level wind resource versus a six or seven level wind's resource, you are talking about the difference in cost efficiency of 20 or 30%. So a four or five level wind resource is going to cost 20 to 30% more. Now obviously you have to get it to where you need it and the yellow dots show population centers and the first thing you obviously see is that the most, the best wind resources are distant from the population centers.

It's similar although not quite as dramatic on solar and that we do have strong solar resource opportunities within California and Arizona, much more closely to the population centers, but it is still not all across the western United States. And then when you impose transmission constraints and what these arrows mean is that at every point where that arrow points that is a transmission constraint. There needs to be new transmission over or through that point in order to be able to significantly increase the throughput of electricity coming from whatever sources, but particularly coming from wind and solar since they are so distant in general from where the load centers are.

One of the things that we also recognize is that coal is today responsible for 33% of the energy in the western United States and if we look at the interior, so not California, Oregon and Washington, it's over 55% of the energy resource today. Coal is and must remain a viable part of the fuel mix. Going back to that first EPRI chart that I showed you, one of the biggest components of carbon reduction will come from carbon capture and storage and I just if I can for one moment just want to give you a bit of warning. Carbon capture and storage and sequestration is a very important tool that we must have.

But as a country if we continue to approach at the way we are right now, we will not get there. We will not get there by 2020 when it's needed and we could risk not being able to use one of the lowest cost indigenous resources that we have with in this country.

We have got to move to large scale capture and storage demonstration technologies and for reasons, I will talk about it in a minute, that creates a huge regulatory question and challenge. So when we superimpose on the geologic sequestration fields, you also see that transmission limitations impose another constraint. With coal and natural gas we can either move the fuel or the electricity. We are not just talking about capturing and storing carbon out of coal, but to meet the kinds of goals that are been talked about in the country. If we have to do it on natural gas, that creates another significant challenge.

With that let me just summarize with a few key issues or recommendations for the governors that I would like to touch on. The first is technology is key. We as a country have significantly reduced the level of investment being made in energy technology over the last decade and a half. On DoE side the level of investment in energy technology has dropped over 80% in real terms since it was created and put in place. The level investing by the private sector has also declined, for lots of reasons whether its restructuring, rate relief issues whatever, it has substantially declined. We have got to find a way to turn that around. One of the regulatory strategies that is critical is to recognize when a utility invests in something and it doesn't work, or it's a new technology and it doesn't work as well as anticipated. Two, for a regulatory commission to say we're going to disallow cost recovery on it because it didn't work as anticipated is a great way to chill technological investment.

The second thing I'd want to touch on is that we need a price for carbon. There is no question -- establish a benchmark, one that reduces uncertainty and helps to establish the basis for us to make decisions going forward. I know that this will not be pleasant to some peoples' ears, but I must urge caution in thinking about regional approaches or state-by-state approaches that can create balkanization of the process of creating a carbon price and not allow the least cost reductions in carbon emissions.

The third item I'd want to mention which is that a lot of work is being done on energy efficiency. In order for us to get that 30%, we have got to be aggressive and that means creating incentives for its capture and recognizing the challenges from an infrastructure side that have to be undertaken to capture that energy efficiency.

Fourth, while RPS have been put in place in many of the states, frankly, they are not that consistent or coherent. One of the frequently mentioned ones that I want to touch on is the issue of if it ain't in my state, it ain't renewable. The Governor of Rhode Island just yesterday vetoed legislation to create an RPS for among other reasons that it didn't require renewables be produced in-state. That is a great way to kill the industry. Because if we don't create the most efficient ones, we are putting an added price burden. We need to ensure that the lowest cost in renewable resources can be developed and that there can be a tradeable market for renewable credits.

Fifth, we've got to retain nuclear power as an option. It is essential. If you look at the EIA analysis that came out on the Liberman-Warner bill, it came out and said well we think we can do this bill without too much impact on rates if we build 260,000 megawatts of new nuclear generation by 2030. That's about 200 plants, 220, we have a 104 in the country today and may be 25 to 30 that could be built in the next 25 years.

Sixth, we've got to recognize that none of this comes cheap. I don't how else to say it, but that the era of cheap energy is over and that doesn't mean to be dramatic, but if you think that the rate increases that are being seen caused by fuel prices, natural gas going to \$12 to \$13. Coal prices moving up sharply because of global demand, you haven't seen anything yet. We are going to spend as an industry a trillion dollars over the next 12 years in infrastructure investment which will more than double the total amount of investment we made as an industry in the last hundred and that doesn't include an investment in climate change. We will see energy prices and electricity prices move up sharply and we have got to recognize the need as you all do, for balance. The last thing I want to say from a recommendation is that there have been many good mandates and initiatives that have been put forward within the states, but I have to tell you, mandates and initiatives are not enough. We need your help to be able to overcome the barriers that exist in order to implement those mandates and transmission is a critical component of that, as I am sure we will talk about it in the future.

So thank you, I will turn it to John.

**John Fielder:** Thank you, governor. It's great to be here. I am glad to see that Niggli and I are here on the panel, because we do have a lot of interest in what goes on in the west. California has a number of initiatives that are aligned with what you're talking about here and the entire two-day conference. As a matter of fact, Southern California Edison particularly is engaged in a number of initiatives. We have participants in the renewable zone study groups. Our shareholders just contributed \$750,000 this week to the western climate initiative to keep that work going, so that we really get a handle on the kinds of thing that work and the technologies that are needed to address global warming here in the west.

We also have a number of projects that we have been looking at, that involve initiatives in the west dealing with carbon capture and storage. And with the support of our regulators we were just authorized about \$25 million to undertake sequestration studies. We have two sites, one is in Utah and one is in Wyoming, where we are actually are going to get some practical experience by injecting CO<sub>2</sub> into the aquifers seeing how it reacts, seeing how it stores, seeing the kinds of movement we have in the aquifers and really trying to get a handle on what is involved in real carbon capturing stores because as Jeff mentioned, this is something that is a ways off, and it's going to be expensive. The more we invest in the technology and understanding this technology the better off we are going to be in the long-term, so we are committed to the kinds of things that you are interested in. I was really pleased to see the resolution that was passed yesterday to support the near zero carbon standard, so that's very important.

Obviously from Southern California we have been in the renewable businesses for a long time. About 16% of our energy that our customers use comes from renewable resources, most of that's geothermal, but we also have wind, solar and biomass. We have a goal to get to 20% of our energy usage from renewable by 2010. It's unlikely that we will make that goal primarily because of limitations on transmission and we will probably be a couple of years late. We have just announced a 250 megawatt rooftop solar program where--if you ever fly into Ontario which is kind of Downtown, LA.--we've got a lot of distribution warehouses that have nice roofs, like a million square feet to two million square feet of roofs.

What we are going to do, is we are going to put solar panels, PV panels on those roofs and deliver the power directly into the grid. We will not need much energy to serve the load of the warehouses because they don't use very much electricity so we can put the excess back into the system. And we will take the renewable credit as part of our utility portfolio. It looks like a 250 megawatt utility power plant. We rent the roofs from the building owners and this is a way to put more solar into the utility portfolio. We are pretty excited about this. Solar is still expensive, but we are able to do the solar project that I just described for about half the cost of what the rest of the industry is doing on roof top solar. We have a goal in California to have 3,000 megawatts with solar installed on California roof tops by the year 2017. The program that I just described is about half the cost and we're advertising and coming in at \$350 a watt which is still expensive, but the good thing about solar as compared to wind--and for all the wind advocates we will take all the wind we can get--but the fact of the matter is it doesn't blow very much on peak. Solar at least delivers on peak and the map that Jeff showed, I think show that in the Southwest there is an awful lot of solar.

We also have a project to look at the other half of carbon capture and storage which is how to produce electricity from the hydrogen that comes out of the process that separates it from the CO<sub>2</sub> in the gasification process. We were authorized about \$5 million from our Public Utilities Commission and we will raise some funding from other sources and one of the things that this group can do is help us find the funding to really do the feasibility study on what a coal gasification, electricity generator combination would look like, because that's what going to be required. This would be a process that will take a few years but if we are going to get to the point that Jeff mentioned, we are going to have to make the investment. Remember we don't have coal in California, so our commission is surcharging California customers who come and do coal research on how to make electricity carbon free from coal in your states and we need the support of the rest of the states and when you ask what you can do, that's one thing we can do.

Let me just comment on the nuclear option. California is probably unique in that we have a statute on the books it says we can't build a nuclear plant in the state until the one of the state energy agencies certifies that the long-term nuclear waste issue has been resolved. As things evolve we may be able to get that statute changed, but I just believe that, if we are going to be serious about the global warming issues and the CO<sub>2</sub> issues, nuclear has to be part of the long-term solution. The numbers that Jeff showed from EPRI way overstate the amount of nuclear that's going to be built and if we are going to get started,

we need to get started soon and we are still not going to compete with the rest of the world for the nuclear technology. China just announced that they were going to ramp up to a over a hundred reactors between now and 2020 to be operational or in construction, so that's going to raise the cost of nuclear, but that has to be part of the picture, you know Palo Verde has had some problems but it will come out of those problems and it is going to be one of the best resources in the west to provide carbon free electricity.

With all the energy efficiency that we do, we lead the nation in energy efficiency, primarily because 20 years ago, we decoupled the way we make money, so we don't make money just on electricity sales, which gives us every incentive to get customers to use less and less electricity, because it doesn't affect how much money we make.

One other things that is very controversial in the industry is whether or not state should do more to get utilities to incent their customers to use less electricity, which is kind of a funny businesses model if you make money by selling electricity. We save about two billion kilowatt hours every year in energy efficiency for our customers, we spend about 400 million dollars in incentives and rebates to get customers to use less electricity. You have to break that linkage between utility earnings and electricity usage in order to really give the utilities right incentive to do this.

There's a number or models across the states. Duke Energy and Jim Rogers have a little different model but the fundamental issue is to drive your customers to be more energy efficient than what we're use to. If you look at data that shows the per capita usage of electricity across the country, California electricity usage has remained about flat on a per capita basis and the per capita basis on to the rest of the country has about doubled, since the early 1970's. So energy efficiency works and it is the cheapest most carbon-free resource we've got. So whatever you can do to get your commissions and your customers to focus on energy efficiency has a real path.

So, let me stop there because there's a whole bunch more we can talk on transmission that we'll pick up in the next hour, but let me turn it over to David and we'll go on from there.

**David Sokol:** Governors, Premiers it's an honor to be with you today. Governor Freudenthal, I think Jackson Hole has a place it's near and dear to both your and my heart. It's a great place to have this conversation because the State of Wyoming represents one of the most vast energy resources in the United States and also one of the most beautiful pieces of real estate in the United States and so balancing these issues is appropriate here I think. I'd like to tell who we are. Mid-American is a largely regulated asset owner. We're about 40 billion in assets, we operate in all but two of the western states and we operate in 28 of the states in total. We move between 8% and 10% of the natural gas that United States uses and we serve 7 million end-use customers. We have vertically integrated utilities as well as pipelines.

Importantly, we're 85% owned by Berkshire Hathaway and Mr. Buffett when he bought into our company 10 years ago, did so knowingly and with concern over the energy and electrical future specifically of the United States. He's been quoted in several

presentations that he and I have made, pointing out that global climate change is a multi-generational issue that deserves enormous attention and that on balance as we look at this issue we should enter on the side of the planet. That is a piece of philosophy that we've been following in our business activities not only at Mid-American but some of the Berkshire companies that I'm both associated with and that are involved in energy utilization and emissions control.

It is enormously important however I think to recognize while the American people on balance agree with Mr. Buffett's assessment that we need to enter on the side of the planet, we also have to face this issue with an open mind in a recognition that we've got into where we are today based on a 200-year utilization of carbon in our economy and that while sound bites are interesting, we have to make decisions going forward that balance the reality of the cost of this transition for the average American and not just the wealthy or those that may not be greatly impacted, but all of the millions of people that use energy in this country including low income and fixed income.

We also need to come together and recognize that environmental groups, energy companies, government have got to work together in an honest fashion to resolve some of these balancing issues, because there are no simple solutions to this paradox and the paradox is this: we believe based on spending quite a bit of money analyzing the technological realities that America can reduce its CO2 emissions by 70% by 2050 and so we are in favor of that type of a goal and that type of a mandate being established at the federal level but there's much more to it in that. How we get there is enormously important because the paradox that we have is that without global climate change considerations for electricity in the United States it is our expectation that electricity rates are going to double in the next five years for the average American. That's just based on current realities that we're facing. When you add climate change to that the question is do we do it in a way that balances cost in time or do we take an easy road and just announce the policy without actually thinking through the implications. Let me give a couple of statistics here that I think are important as we think about this paradox of reducing CO2 and maintaining at least cost impacts to our industry or to our consumers.

We've talked about global climate change now for about seven years, but interestingly during that same seven-year period the United States has increased its use of electricity on an average 1.5% per year and last year 2.3%. So while we talk about reducing CO2, American consumers and industry are using substantially more electricity today than they were in the year 2000. While that's occurring steel prices have risen 280% in the last seven years, copper 465%, natural gas 600%, wind turbines 250% in the last seven years alone. Additionally, over the last eight years we've been living off the reserve margin particularly in the west that we'd had built up an electric system. Because of that there's been far or less recognition of the dangers that we are creating by living off that reserve margin because at some point we get below a safe reserve margin. If there are instances with transmission or power or natural catastrophe, the ability of the industry to respond and to deal with consumer needs and industry needs is becoming increasingly troublesome. So these realities of current cost and lack of infrastructure and construction in the last decade are colliding with climate change legislation if we're not careful and we

think that there could be a serious economic train wreck that can't be avoided if we face these realities directly.

What needs to be done? Greater focus on energy efficiency, no question, utilize renewable energy to the greatest physical extent possible but we have to reduce the roadblocks to the siding in the implementation of the transmission that will allow us to use renewable to the greatest extent. We must require in any climate change legislation, a technology development period we believe of 8 to 10 years to actually develop the technologies that industry needs to be able to create the 70% reduction by 2050. We're not proposing to move the date of 2050 but to add upfront immediately an 8 to 10-year phase of technology development because we think that it is necessary to have those technologies to reach the goal.

We've got to fund that technology development period upfront in order to speed the research development and deployment of these technologies. It's far too easy to say let's just use clean coal and sequestration, the reality is those technologies are not commercially proven and virtually none of your states at the public service commission would allow us or any of our competitors to go forward with such unproven technology and to have the customer bear those risks. We think it's about a \$5 billion per year cost and it'll take about eight years to get those technologies developed, but they will then allow us to deploy the technologies to meet that 70% reduction. Our industry is offered to apply a kilowatt hour charge to every delivered kilowatt of electricity to fund half of that amount and the federal government match the other half. While \$40 billion is a lot of money, in context of this issue, it is a small amount of dollars to be spent to cause the outcomes that we believe are there.

In conclusion, we think the paradox can be resolved in one of three ways and it will be resolved in one of three ways.

A, nothing will be done and if climate changes real the world will pay a serious price.

B, a political feel-good climate change bill will pass with stringent caps but with no technology development and a \$6 to \$7 trillion cost will be paid by consumers.

Or third, a thoughtfully crafted piece of legislation will be developed which acknowledges the enormity of the changes required and will allow for technology development to lead the way in which case we will meet the CO2 reduction targets by 2050 while developing enormously beneficial technologies and minimizing the economic disruption to consumers.

It's important I think that we chose the third option here. And importantly just one comment that I'd like to make in closing on these comments is that cap-and-trade seems to have gotten confused in some people's mind with something called a policy. Cap-and-trade is a tool. It's no different than nuclear energy, it's no different than renewable portfolio standards, it is a tool it is not a policy. It solves CO2 emissions problems and

we've got to be very careful to recognize that as a society, particularly at the federal level where I think we have an enormous lack of leadership on this issue both in the congress and in the White House. Cap-and-trade somehow sounds like it's a panacea. It is a tool. It's no different than a tax or some other tool that we can help apply. What we need is a policy that takes these tools and it will be expensive but we need to minimize that expense and get the greatest outcome.

With that, Michael.

**Michael Niggli:** Thank you, David. Governor Freudenthal, it's great to be back in Wyoming. My energy career has brought me here a number of times. We've contracted for over 300 million tons of coal that you can help power various parts of the United States with. My company, Sempra Energy, is involved with the Rockies Express pipeline which is the country's largest and longest pipeline in about the last three decades, so I appreciate being here. But also we've been doing business with literally every state that's represented here for quite some time except South Dakota and we will get there at some point in time. But this is primarily because of the interconnected electricity network that we have, the high voltage network that connects all of our states throughout the western United States.

I was intrigued earlier today as we talked about, as some of your speakers talked about water, water flowing across borders. Water flows at about 5 to 10 miles per hour. Natural gas and gasoline flows through pipelines at about 25 to 30 miles an hour. Electricity flows at the speed of light. Anytime you have a problem in your state, the rest of the states immediately at the speed of the light come to your help. They come to rescue you with additional sources drained from the kinetic energy of the rest of the system but also whenever there's a problem in any one state that reverberates to the rest of the network. Everybody gets to see that particular problem and that's one of the reasons why we think it's so important to look at the generation sources, how they are going to be located and exactly how we will do that in a manner that maintains reliability in the future.

We are interconnected. Sempra--we own the San Diego Gas and Electric Company--happens to be on the end of the pipeline on the end of the freeway system on the end of just about everything in the southwestern part of United States. So we rely on a lot of people. Also Southern California Gas Company is the largest gas company, gas distributor in the United States with six million customers that are meter customers and over 21 million customers overall. But what I am here to represent to you today is results of some work that was done by a number of our CEOs and in fact this is a group that is fairly intriguing group, it's represented by all of the companies on this particular chart that we have right here.

They've been working for over about the last year looking at the issues of how we are interconnected and how the generation sources should be utilized for the benefit of all of our customers. They've produced what I consider to be a fairly thoughtful study. This was driven by the CEOs of each of these companies. This is not a staff study or driven by staff, this was driven and requested by the CEOs themselves. I think the outcomes that you'll see today are fairly robust. I think you could actually tweak these models quite

easily to do sensitivity analysis that would help us. It is essentially a very good screening tool that we can use in association with your renewable energy zones and in fact we are hopeful that this work will help accelerate the renewable energy zones that you're talking about and you're implementing right now.

This study was produced looking towards 2020 with three commonly held beliefs. One is that electricity is a companion to clean environment, electric transmission is an enabler of a renewable society and that a robust and thriving economy provides the resources for maximizing environmental protection. So with that the CEOs had decided that they needed a region-wide study. Some of the major parameters they looked at included the supply and demand curves--very important because often times you'll see a supply curve or a demand curve but this is a study that looked at both of them together. Also looked at the production cost from each and every zone in the western United States and the requirement for firming resources behind the intermediate resources we're looking at. Wind and renewable resources, solar resources are not as completely solid as you'd have for gas-fired to coal-fired resources, so you need back-up and that was modeled in here as well as well as was the transmission integration cost that we put in place.

This is a multi-regional evaluation and it looked at the sensitivity on the value of the renewable energy credits all from publicly available data. The way this was done is to look at the supply and demand curves for each of 11 different zones in The Western Electric Coordinating Council. We took the 2008 loads and grew those loads to 2020. Today we have about 150 to 155,000 megawatts of demand in the Western Electric Coordinating Council. Resources are about 185,000 megawatts altogether. So we took these areas, looked at the individual components of each area and then we started look at well what happens if we add these renewable resources and you interconnect them with the rest of the system. Given that you have specific cost and different quality of resources in each area, you're trying to find the most optimal way to grow. We have to make some smart choices as we move toward a non-carbon future. So we calculated the change in cost to all of these customers and we started connecting some corridors between the areas. What was driving the corridors that would be established were differences in the supply curves by region. Essentially you have lower landing cost in the interior west, lower labor cost and sometimes often better resources themselves. The demand by region was also examined where consuming regions like California and the Northwest use up larger shares than they can produce in their areas and need to import additional renewables.

I'm going to show you these results of the table on the right in a map form in a moment. We actually did this study on a basis of what would be the conservative benefit to cost ratios for about a 1,500 megawatt line, a good size transmission line connecting various regions. In the first case, we looked at base case renewable portfolio standards. 15% of the energy throughout the WECC would be renewable by 2020. I think that's a reasonable target for a lot of states not unreasonable and everywhere you see the blue on the right hand side you'll see a benefit cost ratio that's above 1.0. That indicates a line connected between the producing region and the consuming region makes sense. Everything in light blue something you got to look at carefully because it probably makes sense because

we've been very, very conservative in these studies and have not overstated them. We then went to something that's called the high RPS. This is where you take it to the next level and you go to about a 25% renewable portfolio standard in every state except California which we had at 30%. That results in a 27% average throughout the western US. Now look at the second dash mark. 28,000 average megawatts of new resources WECC wide means that at about 30 to 33% capacity factor you'd need three times that many megawatts of renewable resources to meet the high RPS. So you're at about the 85,000 megawatt requirement to meet the high RPS standards. If you think that 25% is reasonable this is what we would need in terms of non-carbon producing wind or solar, a very, very large thing to think about.

We then went to a case that was actually even more interesting it's the CO2 reduction case. Jeff had pointed out that the challenge we have in trying to get back to the 1990 standards and so the CEOs said let's take a look at 30% reduction in CO2 levels from the 2008 levels that'd get you back down to about 1990. And what does that mean? Well, that means there's about 43,000 average megawatts of new resources, non-carbon resources that you need. If those are all wind and solar that would be a 120,000 plus megawatts, clearly you need nuclear, you need coal sequestration you need other resources to capture this kind of a carbon reduction program as well. So, we then took one last case and this case it was something that's been suggested for a long, long time is that solar is going to be less expensive. So, we looked at a solar less expensive case and we modeled a lot more solar in California, Arizona, and Colorado as well and we'll show you results of that on the maps because it does reduce the amount of transmission needed but I'll tell you back 37 years ago when I join the energy industry one of my first assignments was this really fancy new technology called solar photovoltaics. We thought it was right around the corner 37 years ago and it was going to be at a cost of about \$0.10 a watt. I guess John said it's \$3.50 a watt and that's if we can get it down there and so we're not quite there but hopefully someday that will be an outcome.

So let's take a look at the maps themselves. This is really the base case RPS. This shows lines that are about a 1.0 or better benefit to cost ratio. A lot of capacity from Montana, Wyoming is coming into the consuming states, also from New Mexico and Arizona. So how does this change if you go to high RPS? This is a chart that shows the maximum opportunities that would be needed and frankly are cost effective in this case. A tremendous amount of capacity from Wyoming into all the other areas and also when you are in the high RPS you also see some of the consuming states start to work up the supply curve for solar and actually to starting to supply some of their own needs by solar.

Take a look at the CO2 reduction case. What happens here is very interesting because there's fewer transmission lines but that means that your costs have gone very, very high because you are working up through the supply curve on solar in all of the states and have reasonable solar resources.

And then finally, what if you have low solar costs? Looks like still the great wind resources in Montana and Wyoming are probably still effective On the edge some of the resources in New Mexico are also very close to being cost effective. So at the end of this

we did one last analysis and this was to look at renewable energy credits. It's been mentioned today that renewable energy credits could be somewhat valuable. This is a very conservative analysis that identified an annual value of renewable energy credits of at least \$351 million. The sensitivity study suggests it could be multiple times of that. And some of the chart here shows that you end up subtracting some renewables because they are too high cost and allowing the lowest cost renewables to come into the mix first and therefore making an optimal choice for the customers in the region and actually minimizing the number of transmission lines.

So with that, we wanted to make a couple of points. One, if you go back to the year 2000, since then FERC has actually certificated over 10,000 miles of natural gas pipelines that physically crossed state lines. Since that time there have been 917 miles of new electric lines. I have a feeling this is going to change if we're going to meet the vision that the governors have for renewable society and a non-carbon society in terms of generation. We'll have to flip this around. So what can we do? First of all, we've got to recognize the interdependency of our networks and we will work with you to do that. We need to recognize the benefits that we have of that interdependency that has been here for a long, long time and many, many decades between all of our states and between all of our companies.

Electric transmission is the key element in unlocking substantial environmental value not only on renewable energy development but ultimately if you can electrify transportation and you end up in a situation where you have fewer emissions as well and then hopefully we can get a common vision among disparate groups on the need for renewable energy and the associated transmission because you can't have one essentially without the other.

What do we need to do? Finalize our renewable energy zones. We offer the work we've done and it's the work we can do to work with you to finalize that as quickly as possible, determine where the transport corridors makes sense, utilizing some of the mapping technology that was discussed on Sunday. The Chairman of ESRI was discussing the mapping technology that we think could assist that as well, I think we could get to some fairly quick evaluations of major corridors and then develop common siting principles. How do we follow existing corridors, how do we super size or take the next step up on transmission? If you went from a 345 KV line and built it for 500 KV line and you put it in place, you would double the capacity of that line. So you have an opportunity to think much further ahead and not have to come back for future land use impacts if we are careful about how we utilize our transmission siting and we also want to minimize subsequent project specific environmental reviews.

None of this is actually beneficial if we do all this planning for major corridors and we end up having to do twice the environmental studies. That doesn't work, that doesn't work where we need to be and as the previous speakers have said there are a lot of good technologies we're looking at for the future but right now we need to look at renewables. Frankly natural gas is going to be in the future for a lot of our companies as well and we believe that we need to establish a REC market and REC trading market. These are some of things I think we've looked at very carefully. I'd also add that one of the things that

comes to mind when we talk to developers a lot are the issues around multi-year tax credits. Can we establish multi-year tax credits that allow them this certainty to put the risk money up to develop some of these projects? I've been in that position as a merchant generator. Uncertainty is the name of the game you really got to manage that.

Thank you very much.

**Governor Freudenthal:** Thank you and thank you to the panel. If we could, if there are any comments or questions from the governors or the premiers, we'll try to focus on generation and then we'll go back later and talk again about the transmission. Governor Richardson?

**Governor Richardson:** Can I ask a question about the cap-and-trade tool, David? Alright, so I understand that we need to give the generators time to adapt new technology and it may be eight years. We're probably going to be in a position as governors and premiers to make some recommendations to congress and what they do after the election. They took a run cap-and-trade but it was really not even a good try. Next stab at it they are going to come up with something that makes sense. Let's say hypothetically the next try they say we're not going to cap-and-trade, we're going to put a technology fee on it, it starts in 2012, it's \$12.5 per ton of carbon dioxide and it'll increase it increase it 5% per year. It's not a cap-and-trade we're not going to franchise those who are currently producing CO2 but this should give an inducement to all of those companies to start deploying new technologies and emerging technologies. The technology fee, 100% would go into a fund that would be a private fund, it would not be public, it wouldn't be money that would go to a big black hole back there in Washington DC somewhere and this private fund would spend 100% of that money in developing carbon sequestration technology, carbon capture technologies, so critique that?

**David Sokol:** Well I think you're heading in the right direction. Let me first be clear. We're not opposed to cap-and-trade. Cap-and-trade properly applied when there is something for us to do i.e., put technology on our plants is a perfectly fine mechanism assuming it's put in place in an intelligent time frame. So the eight years I mentioned would be that you put the cap-and-trade system in place today but there would be a small of activity for the first 8 to 10 years while these technologies are being developed. Simultaneously that funding has to be there. What you're proposing is very similar and frankly I think more honest and that is called the tax. Tax carbon emissions and take those dollars and use them to develop technologies. I actually think that is the most direct way to approach this issue because it approaches both sides. It says CO2 is an enemy and therefore in increasing amounts over time we're going to tax it and we're going to use those dollars to find the technology glide slope that we need to bring the technology on. Most of us sitting here today have done a great deal and we've reduced our CO2 emissions even though we're a growing company by 6% since 2000 that's not easy to do when you got a 2% growth in your underlying utilization. We have 3,000 megawatts wind that we own plus geothermal energy that we own and 21% of our generation capacity today is from renewables but we're now up against a level where we can't we couldn't possibly meet the Lieberman-Warner cap-and-trade requirement starting 2012

without basically shutting plants down and turning lights off. That can't be the right answer so what you're proposing you know frankly I would call it what it is because I think a tax is what it should be called and it is what we were doing and then use those dollars to get us there. Unlike the Lieberman bill, which would raise by Senator Boxer's estimation \$7 trillion. But when she articulated the thing she'd like to see that \$7 trillion go to climate change wasn't one of them.

**Jeff Sterba:** Governor, could I add one thing to your thoughts because the notion of having to create a different type of funding mechanism for technology is a very, very important issue and to be able to use private markets isn't research that much. It is development and demonstration projects. Two thoughts; first, let's not wait up to 2012. we need to start that now. Second, you will find that most of our industry is willing with some reservations to have a fee imposed on our electric bills to help fund that. Now we have some members some utilities that feel like it's mostly geared towards coal so they don't want to participate in it, but Rick Boucher who is Chairman of the house subcommittee for energy and air has put forward a bill that does create a fund by leveraging a fee on all fossil generation to create funds and it's about a \$1 billion solely for CCS, that's really important. But we've got to go beyond just carbon capture and storage. There are other technological challenges that we face and we need to generate those level of funds now because every year we fall behind. The second thing it, I very much appreciate what David said about eight years on the technology side. I agree with that on pure technology. What I'm concerned about on CCS is regulation and public acceptance and I'm not sure eight years build in adequate time for the testing the knowledge base to be formed such that these claims can be put into place on a commercial scale. I think we'll have the technology issues addressed but the political acceptance is the real challenge. Yes this is CO2 and it's different, but we will run into challenges in getting the public to accept pumping that stuff into the ground.

**Governor Freudenthal:** I think Premier Wall would like to speak but before I do Michael, I was asked if you could provide us with copies, hard copies of your presentation chart, can you do that?

**Michael Niggli:** It would be glad to do that and in fact, it will not be very long and we'll have the entire study put on the website and we will make sure that you are the first to get it.

**Governor Freudenthal:** Thank you. Premier?

**Premier Wall:** Thank you, Governor. I am particularly interested in the comments from all of the panelists but particularly Jeff and John on carbon capture. Just for a little bit of background, our province produces about 26% of the world's uranium about a third of the world's potash. It's not necessary in play here today but just in terms of our resource profile, we are the second largest producer of oil in Canada, next of course to Alberta and third on natural gas, next to British Columbia and our governments – both this new government and our new government and our predecessors to their credit have made a significant investment together with industry on the issue of carbon capture moving

towards those large scale demonstration projects that you spoke of the first what I think would be the largest carbon capture and storage and then enhanced oil recovery initiative in the Southeast portion together with EnCana where it was sequestering CO2 from Beulah, North Dakota. Our governments also announced together with the federal government a large scale about a billion for clean coal demonstration project at a generating facility in southeast Saskatchewan in Estevan and we are working now with an oil refinery in Regina, we being the petroleum research center at one of our universities on a \$30 million project called Aquastore. We talked this morning governor about the importance of this group recognizing the huge opportunity that exists if we were to take a much more coordinative and cooperative look at all of these technologies we are testing. We're demonstrating the same sort of Aquastore technologies and I hope that can come from this discussion and tomorrow's as well, but I will be interested in the comments of the panelist about that. I would like to know your knowledge or awareness of inter-jurisdictional, interstate together with the provinces coordination of the analysis of these large scale demonstration projects that are underway and governments are prepared to put some investment into together with industry and I wonder if you could comment on that or that little cooperative aspect?

MALE SPEAKER # 2: Let me just mention one. I think this problem has been acknowledged. I am not sure we have solved it altogether, but you know there are regional partnerships associated with coordinating sequestration studies in different geographical regions of the country and it was kind of sponsored by DoE and as a matter of the fact, the efforts that I talked about, and I think other efforts that you contemplate in your resolution were in conjunction with the Southwestern Sequestration Partnership. So, I am not sure how far north that gets into Canada--I don't think it gets into Canada--but at least within the west there is some semblance of a government structure that brings order to all the investigations and the fund raising and where the projects are located and so forth.

MALE SPEAKER # 2: Premier, I had the pleasure of meeting with your energy minister about three weeks ago and talked very specifically about the CCS initiatives that you all have underway within two specific projects. It is absolutely not only viable but essential that we be willing to go beyond country borders on the sharing of technological development. If you look at Europe, there are some similarities in the geology and Europe is facing the same thing yet and I don't mean to criticize United States but yet in the United States we today still have not accepted the codes for supercritical coal development, which has already been proven and implemented in United States. We haven't accepted the codes for some of the metal alloys to be able to use that same technology. So, we are still going through our process. So, leveraging technology investment across countries and across borders is essential. In that conversation with the energy minister he said, we are having to make up regulatory rules on the fly in order to address how are we going to handle CCS. Well, that is exactly right and it's got to be done and the way we can share information about those that it can just advance the cause got to be done.

**Premier Doer:** Yes, we have in Manitoba in a private company the person who developed and took three or four swings at it before he got it right. The sequestering is going on in Weyburn and they are getting the tremendous increase in oil production and also the benefit of sequestering the CO2 emissions. We are going to just do it in Southwestern Manitoba, taking CO2 emissions from the fertilizer plant and an ethanol plant and we have got the person who has already done it. We think it's going to work and it's going to work to reduce the emissions and get more production. On the regulatory side, I remember being in Albuquerque a few years ago, when we talked about renewable energy targets. We talked about energy efficiency. We talked about a basket of traditional and renewable energies as part of the solution in western United States and Canada and we also talked about the difficulty in establishing and getting approved transmission lines for renewable or other electrical sources. I might one ask any of the panelists, is there any model where we can balance off the public interest of the impacts of transmission against the special interests which forces us to have delayed decisions being made. In the case of Canada, there was just a transmission line canceled between Calgary and Edmonton and another transmission line that ran into difficulty in British Columbia. We are just not approving any transmission lines in Canada. I think in western United States we are going to accountable 10 years from now or 12 years from now when the lights go out, but were caught in these regulatory issues. The public has the right to know what's the most environmentally sensitive. I respect that. We were trying to do that to protect (some project) in our jurisdiction, but we need the completion of impact assessments, not indecisive or dithering processes which I think we have now quite frankly all throughout North America. Is there any model I can look at to legislate?

**David Sokol:** Your question on transmission is enormously important. It's government that makes the policy and we have committed \$5.2 billion for a series of a eight transmission interconnections that frankly are two decades old in the west. We're in the process and Governor Freudenthal, Governor Huntsman, Governor Otter's teams at the state level have been spectacular to work with. Where it breaks down is between special interest groups and frankly the federal agencies. We have got in one agency a federal coordinator in Wyoming who is doing his best to make this happen. We then have seven field officers that act as completely independent officers. One is suggesting that just put it underground and it won't be a problem and other is suggesting a routing that is interesting, but it doesn't connect anything at either end and we can't get a commitment from that agency as to just tell us the process. Right now, we have seven different processes, each of which will not give us a time frame. We have to find a way to solve these problems because quite honestly with renewables we have done most of the low hanging fruit as an industry and so it looks real good on numbers. They have grown rapidly. Renewables are more expensive and require transmission and so your issue is correct now. Environmental groups and special interests have a place to play in this. We as industry, as government, have to agree to try and find compromises, but those special interest groups have to come to the table as well. It is not reasonable to allow an environmental group to say I want 70% reduction in CO2, I want this, I want that, but you know, what you can't use nuclear you can't put any more transmission lines out there and other issues. The government has to work with us to force those folks to the tables, the public service commissions, and I can't give you a blueprint. I can tell you we are

prepared to go forward and build these lines. We are doing the work. We are doing the permitting work and we will build them but we're already well behind the schedule for exactly the reasons you identified.

**Michael Niggli:** I would like to add if I could that one of the issues we run into a lot is synchronization or lack thereof of the federal and state processes. We go through this process. We have joint co-leads on a lot of our programs, but at the end of the day you get a state decision, but you don't necessarily get a record of decision from the federal government until a later time. This is one thing I think we got to clear up in the US and get the decisions to really synchronize overall. Also, one of the issues that I fully agree with David on is that we need to bring the environmental clients to the table in this very early and this is part of what the WREZ process should be, this part of what you know establishing corridors is all about. But you can't do that unless you have decision makers from the environmental community and represents a really broad spectrum so that we can get real life consensus because I think what we need often times is there are many environmental groups that think very broadly about our problems and energy problems and are willing to work on solutions but when you get down to the individual siting at the local level, you have NIMBYs that rise up and create tremendous delay in these processes and we have to find a way around that.

**Jeff Sterba:** Governor we have morphed into the transmission discussion and Mike's presentation really was the kick-off to the transmission piece. I think what you've raised premier is one of the critical and very touchy issues. Mike raised the issue of federal versus state. And you saw in his presentation that pipelines which are licensed at the federal side and we have built 10 times the amount of pipelines as we have transmission where transmission is licensed at the state side. That's one of the challenges we face. You could make the simple case that well if we gave the Fed's the right to provide siting authority that you could solve that problem, right! Well, I don't think so. So, I think there is no simple solution to that. The states have got to be involved, but one of things that we have got to do is that the states have to rise above the notion of the individual interest to look at the collective good. What does that mean? When we have congestion, someone benefits. Why? Well, there may be a captured or a trapped resource that can't get to market and move to the place where it ought to be used. So what happens? It gets priced below its market value for the benefit of that market. So, someone benefits from congestion. But if we take that approach then all of us will have the other side put on us where we will see the detriment of congestion. One of the things that I think the WGA could really help with is looking at different models for the sharing of benefits of multi-state transmission because if we go the traditional way of going to a pay a right of way fee to procure right of way and the transmission line isn't going to benefit anybody in that state that we've got to go through, what are the choices? The state either blocks it because there is no benefit and probably harm, right, or it could force it down their throats.

Neither outcome is a good outcome and in the west we are seeing that happen right now and those kinds of stand-offs don't advance the cause of building transmission so we could more effectively utilize renewable energy. So, if there was one thing from a policy side that I would add to the list, it is trying to develop a protocol under which states

recognize that there must, maybe it's a sharing of benefits but also a willingness to allow something to happen for the benefit of the overall good.

**Governor Huntsman:** Let me just take this opportunity to thank the presenters for being here taking your time and sharing your vast knowledge and wisdom with us. It's just one of the great things about participating in these meetings is hearing the best thinking from the real experts out there in a certain subject field. I would like you to just reflect for a moment on the broader energy picture not transmission but just energy. You know we kind of started out there a moment ago and I am reminded after a lot of these decisions, you know, we had some great thinking out there, good ideas, a lot of tremendous knowledge and intellectual property being put into our future, but then I'm always hit by reality and that is, this is less about science and it's a lot more about political will. So, we have an election round the corner. We have a chance and opportunity as an organization to really impact the lay of land with respect to energy and I am reminded of the speech that John Kennedy 1961 at American University where he talked about moonshot. Someone talked about this, you know, we need a moonshot. Well, I think there is some truth to that. So, between 1961 and 1969 something quite remarkable happened and there was a coming together, private and public sectors and a lot of innovation that took place, a singularity of purpose, if you will. So, let's talk about a moonshot. Just individually, if you would very briefly, you sit down with the new president and new administration. What does a moonshot consist of and what your best advice to the next president in terms of what needs to be done now? Jeff, we will start with you.

**Jeff Sterba:** That is a great question. I would pose it in a couple of pieces. First, technology and technology investment on a broad spectrum basis and creating a vehicle that facilitates the best that the private side brings to the table. That is, managing scarce dollars to get the best value on the development side but a socialization of the those costs, because the benefit of having the technology that we need for the future is going to benefit everyone, so it needs to be socialized. So, number one is technology investment. For me that's in the \$5 to \$10 billion range per year for an extended period of time. But that is a kind of investment and that's not just in our sector and that's broader. So, when I look at our sector, I would say it's less, but a large piece of it is within our sector. The second is that on climate change, that there is no doubt we must do something, but we must view it, I believe from a transitional perspective. If all we do is create a high price for carbon in the short run, the only thing my industry is going to do is switch to gas and when gases already at \$13 a mcf, I don't know what it goes to, but you can easily see a 15 or 20% increase in demand for natural gas within a 3 to 5-year window, that's going to force prices up enormously and I am not sure we have got the delivery system that can get it all there. So, think about doing this in a transitional way where we absolutely are committed to the 2050 windows and we even try to shorten that up to 2030, but if you try to do it in a way that places a volatile price through the near-term, you will just do the tremendous damage to the economy and I think run one of the greatest risks we have which is to impose a feel good like David mentioned a feel- good theology, ideology-based approach that the entire country will rebel against once it is implemented because of its cost and we will go back to do nothing. That to me that's failure. So, avoid failure by thinking through the unintended consequences and build a transitional strategy that

moves to an unencumbered carbon price in the long run, but does not implodes it in the short run.

**John Fielder:** I think the first thing that you'd have to suggest is to create the vision like we did back in the 60s about what it is we're trying to do and it seems to me that both candidates are likely to be in office next year have to spend time with American people in terms of getting them to understand what the issues are around energy and global warming. And if you create that vision, then I think you can mobilize the primary financial resources to do the kinds of things we need to do. We need to invest in the technology across the board plug-in hybrids, clean coal, nuclear all those things could require the kinds of investments we're making in the world today. To redirect those kinds of expenditure levels we do the world good for moving us towards the vision that I think everybody has, which is that we have a much lower carbon footprint in 2050. This is a long-term view. This is not somewhere you can get down the decade even in one or two election cycles. So, creating that vision and then funding it with the kind of resources we can fund the world with, it seems to be the way to get something done.

**David Sokol:** It's a great question governor and I think the next president can do more than anything else is utilize both the Democratic and Republican parties, which in my view are both broken, at an international level and actually ask them to have the president address this with genuine vision, because that's what we need and what president Kennedy had. The vision has to be perhaps at 70% reduction by 2050 but it's got to be a slow stop and reverse vision that gets us off to CO2 path that we were on. It's got to start with technology and funding immediately and it should be a very short period where the president puts together some of the best minds throughout environmental groups, industry, various industries, and establishes those goals, but most importantly I think it's that vision and it's the honesty. You know when president Kennedy gave that address in 1961, you had the Cuban missile crisis beginning, being drawn into Vietnam, a recession and he came to a joint session of congress and said I have a vision that we can develop this technology, send a man or woman to the moon, and retrieve them within 10 years, but it is going to cost \$9 billion of your tax dollars in 1961, and if we are not going to commit the dollars upfront then we shouldn't start because we will screw it up. But, the spin-off benefits of the technology would be enormous and he sold the American people in a time of frankly of a lot of distrust on a vision and if this president comes forward and does that, I think the American people are prepared to pay a significant price to resolve or at least have a meaningful effect on global climate change. The technological spin-off for this country to be able to sell those technologies to China, India, and the developing world. They are not going to develop them if we don't, and if least country can afford to do it, no one is going to. So, that is the honesty of actually telling all the truth to the people that we can do it, but it's going to cost real money and it is going to take real time to do it, are we committed to this.

This sound bite—let's have cap-and-trade--we are misleading the American people. We are not telling them the enormity of the challenge giving them the pride that we can do it and then asking for their honest support because we are all going to have to pay a price to

do it. If you all can get the next president to do that, the details will work themselves out. It is that vision that will get us there.

**Michael Niggli:** I agree with what my colleagues have said, but one of the things that bothers me and I worry about a lot is that our political will sort of ebbs and flows from time to time. We may all believe right now, we can come to a long-term vision of what we want to see, but there will be other people in office over time, the United States fortune has changed from time-to-time and that changes the equation. So, I take a look at it from a risk management standpoint and where I think this group of CEOs would like to be probably is we want to have the nuclear option at some point in time be available to us. We like to have carbon sequestration be available to us as well so that we can make those choices down the road, that means the technology investment that the others have referred to, but in the meantime in the short period, you have limited choices. Those choices are natural gases as a feedstock in many cases, a little bit of coal that can be accepted and permitted from time-to-time and you have renewables.

Now, one thing about renewables is that the beat that goes on and I think about it in the context of back in 1950s, the United States built an interstate transportation system highway system. Why did we do that? We did that for national defense. We did it so we made sure we can move people and goods, and arms, and everything all over the country. We have the best stages of an interstate transmission system and transportation system. But, we don't have it complete and we don't have it to the capacity on the electric side that we need. If you do something like that it actually has a number of benefits for the robustness of the system for all of our states and has the ability to move these different resources that will develop in different areas of our country from one side to the other in a most economic profitable way. Taking your WREZ plan and matching that up with technology on the corridor side, allows us to identify this in advance and as quickly as possible and allows us to move forward on something that we can make an impact on very quickly.

**Governor Rounds:** Thank you, Mr. Chairman and I am listening to your comments and so forth. I think it's very important that we promote the idea of a national vision in this. In fact, it is not only a national vision, it's an international vision and it includes everybody in the North American continent as well. Premier Doer when you were speaking about the challenges that we have right now in front us and I think in many cases governors are faced with the day-to-day activities that we get not so much bogged down, but we are intensely involved with. I think back to the one that we have been working on it for two-and-half years now, and that has been, we have an existing transmission line between South Dakota and Minnesota. I have a new power plant which wants to go up with about 800 megawatts of power. It would be in South Dakota moving needed firm power to Minnesota and Wisconsin but along with that they have offered to upgrade it by an additional thousand megawatts capacity for the wind generation for the Dakota Hills area there in northeastern South Dakota. We have been trying to get the existing power line upgraded. We have argued for two-and-a-half years now. Now, if we can get the day-to-day activities completed in some semblance of time, we used to be able to get to the moon in nine years. We can't even get the transmission line built in two-and-half years.

So, I think there is more than just vision involved here and there's got to be a clear cut series of guidelines and rulers that have got to be almost universal in nature and I have liked some comment in terms of your thoughts about the practical needs that you see every single day and you would love to have changed not just in terms of the vision but the specifics of things that perhaps you found to be absolutely just shutting down our movement right now in terms of the industry getting things done that they would like to have done.

**John Fielder:** Let me comment on it. It seems we're into my subject anyway that I was going to introduced. You know, two and half years, you can get some done in two and half years, you are terrific. Our planning horizon for the kinds of transmission lines we were talking about, basic infrastructure that move power long distances is a seven to ten year effort from planning to getting something operational. The bulk of that is held up in the regulatory approval environmental review processes and you know that is where I think attention needs to be focused. One of the things that we've learned is when you are building interstate transmission facilities, you've got to take in to account the needs of all the states that that transmission line is touching. You can't just think you're going to run a transmission line through some place and not provide benefits to the local communities that are around that transmission line. So, we have got to figure out a way so that one of the other things that we have considered and are doing is making sure that we drop enough substations along the route so that local communities, local states can interconnect either take renewable power out or put the renewable power in. If you build along DC line that doesn't happen. So, the planning that goes into those kinds of facilities that run across state lines take a lot more time and you have to do a lot more stakeholders and when you get into other states in which you were used to do in business in that is a tougher issue and I think we have learned a lot and we will continue to be sensitive for those needs. David mentioned the federal agency issues. We have got a line that was approved by our local regulatory authorities in May of 2007, and goes through the Angeles National Forest and has been approved by everybody except the local forest ranger, who was waiting to issue a supplemental permit and it has not been issued yet, he's holding up the entire construction on that line.

You know, 60% of the land in the West I understand is federally controlled. Somehow, we have to get the BLM, the U.S. Forest Service, the U.S. Fish and Wildlife Service, to get into with what the requirements are. Because right now if you don't get those federal agencies lined up in the right sequence, for example, the Forest Service will not issue a record of decision until the Fish and Wildlife has signed off on endangered or threatened species and you have to do that first. So, if you haven't been working with the Fish and Wildlife Service, you are going to get delayed another couple of years. Focusing on the federal agency issue is really important in our mind. That is tough because they don't have the resources to really deal with the lot of the major projects. They don't have time lines to meet and it just drags on and continues to delay these projects. The last one that we come into in California is who is going to pay for the line. When you have multi-state transmission lines, do you have transmission owners that are willing to step up and invest the money and now we are talking a couple of billion dollars. The question is how are they going to get recovery of that investment? Traditionally, it has been that if you build

a transmission line you go to FERC to get cost recovery, but FERC traditionally had the position that unless you can show me the generation that's going to connect to the line, I don't know it is needed or not. So, it is chicken in the egg, given the transmission lines don't get built because there is no generation and generation doesn't get built because there is no transmission.

We passed the statute in California a couple of years ago that broke through that logjam and said look if a transmission line supports a renewable zone, which is this renewable zone effort that's going on, it will be really helpful for then we are not going to question the cost recovery if a generator never connected to it. We will let the investors that invest in their transmission line recover the cost even if a generator never connected. Now, the odds of that happening with what we just talking about are pretty small, but it took a regulatory decision and then some statute to really break through that logjam. I think something like that in the west would really help because once we get these renewable zones identified, we need to have people that are willing to invest a lot of money if they are going to get recovery even if only 80% of the wind mills that we thought we're going to sign up actually get built. That's important because the generators will not build if there is no transmission. So, I'm not sure that answers your question, but there are two to three areas where I think we can really try and accelerate the process.

**David Sokol:** Well I would just say that, yeah, I think it's part and parcel with the vision. We can't have the situation where we got six or seven federal agencies, many of which are actually working to oppose transmission siting, from the same administration. FERC on one hand is trying to be very helpful and we have got others that are actually trying to see if they can stop it and I think hopefully a president can provide some direction on that regard. When a pipeline has to get built FERC ultimately steps in and we get them sited and built. Transmission has worked that way, so we got to have at least cooperation and particularly in the west, so much of the land is federal that we would have to get their cooperation.

**Michael Niggli:** I think also we need to take a close look at the processes we have in place right now because I think almost every transmission line I have seen takes longer than the last one every single process we go through. And a lot of this has to do with the rules and regulations we put in place. We are not necessarily dealing with perfection here. We're dealing with science certainly and we are dealing with political will, but not perfection and yet I think sometime our processes are designed to deal with perfection and we need to take a look at that. John had mentioned the issues around species and species that are protected. In Utah, I think there are something like 20 different species that are protected. Nevada has about 30, Arizona a little more than 40. California is 304 species that are in some way are protected and we have to address those and all of our environmental impact. So, we have got to be more towards the perfection side, but all I am suggesting is that we need to find a way to move through this quickly.

**Governor Freudenthal:** Two things that I want to raise. One is, talking about this public acceptance with carbon capture and sequestration, we have been doing it for years and in Wyoming we call it enhanced oil recovery and it's not run into problems. In fact this last

legislative session we passed state legislation that sets the regulatory framework in place that deals with the question about who owns the right to inject--the surface owner or sub-surface owner. I think the government should weigh in on the long-term liability on CO2. It has to be accepted in some form by the federal government. I am nervous about the old tax and creative fund thing we have did on nuclear waste because the fund disappeared. So, I am not sure quite how you do that. But, I was not prepared as a state to say I would accept it on my state balance sheet forever, particularly for power that's generated for other state use. So, I think if we deal with the liability question, the comfort question is one that there are particular areas that are accustomed to sort of drilling and pipelines and stuff, that sort of thing moves forward.

Second thing is I want to pursue your point about cost allocation versus benefit allocation. Utility law deals fairly well with cost allocation under traditional principles. You have injected an entirely new component which is a benefit allocation. And in the absence of benefit allocation, the efficiencies we want to achieve on DC transmission go away because you can't have enough drop off points to play Santa Claus as you go down the line. If you are going to do DC transmission which is where the efficiencies are and if you are serious about looking for efficiencies as a CO2 management measure, we need to take steps towards the efficiencies. So, do we need to go towards an essentially merchant power construct that is separate from the traditional public utility law that is applied in each of the states?

**Jeff Sterba:** Two very, very good points, Governor, let me address the first one first. You are absolutely right and I think that was in the west. We have a leg-up and in fact we actually pump CO2 out of the ground to send down for tertiary oil recovery. But here is the difference. When we are doing EOR, we are replacing a molecule of oil with a molecule of CO2, so the oil comes out. Second, you are not as concerned about whether that CO2 stays in the ground. When we talk about carbon sequestration, we are talking about moving it into the some strata that probably is a saline aquifer which is really dense rock that is pushing a molecule of saline water somewhere else. And I think one of the arguments that's being made is okay, but what are the longer term impacts of that? Do we run the risk of polluting our ground water sources, our underground aquifers, are we pressurizing that or are we creating some other I mean the explosions or whatever. So, we have that challenge which I think creates a distinction between EOR. The second piece is the quantity that we are talking about EOR may be able to be one to two percent if that of what needs to be done. So, I think that your points are very valid, I just don't think it's going to be sufficient as we move forward with CCS. Your issue on liability is absolutely right on. You know for a lot of states you have to address who is the owner. Is it mineral rights? Is it under the existing mineral right? Is it land ownership? In the west, we segregate between land, water, and mineral rights. So, is this within those three or is that outside of those three. So, there are some issues like that that got to be resolved and like our good friends in Canada are doing, some of that's got to be done a little bit on the fly learning, but put something in place. Don't let it just be litigated to death. On your second one Governor, that is a much more heady question that I wish I don't have an answer to, but I think we need to think about the benefits in a different way and they are to be fairly pointed. Look at Arizona and the challenge that's going on about building a line from

Palo Verde into California where the line has been denied by Arizona because they perceive it will cost them. Frankly, one of the costs that they will incur is that capacity that's in Arizona today will have a broader place market, it will move to those markets because of price and it may force energy prices up in Arizona. Well, but if it makes sense on the whole, so you increase the size of the pie. There is got to be a way to create an allocation system that at least satisfies the need to avoid the penalty if it truly increases the pie which I think that's what these lines are geared to do. It requires a change in mindset. It requires regulators to stop thinking so, excuse me, damn narrow minded. It requires them to think more broadly about how things can be done and to collaborate on how that can be done.

**Governor Schweitzer:** I just have a quick question and it won't take long and I want to go around to our experts because I know that you are all part of these business as your business. During the next 15 years, how many megawatts of non-carbon capture-ready coal plants will be completed in this country in megawatts? Just give me a guess.

MALE SPEAKER # 1: Without legislation or a climate change that allows it or a catastrophe that demands it, virtually none.

MALE SPEAKER # 2: I would say probably 12 to 20, because you have got some that are already in that process today and they are not here to be capture-ready. Let me change that 10 to 15.

MALE SPEAKER # 10: So, are we agreeing that just those that are in the pipeline right now that they have been permitted that there has been concrete pour, there is steel, we can go ahead with those, but if we are still discussing a new source of energy it is not likely to be a coal, that's non-carbon capture-ready.

MALE SPEAKER # 4: I think you're going to find there may be one or two slip through but there is not going to be very many and it would be very hard. Someone has to get to put a lot of risk money into going after a project like that given the, you know, the seriousness of the issues around CO2 and global warming and the advent of real focus on it.

**Governor Freudenthal:** We'd rather to wind down I would invite the panel before we move to the adaption of resolution if there are any closing comments that any of the panel members would like to give, we would be glad to hear.

**David Sokol:** Governor just two; a wise man said to me five years ago when we started talking about global climate change. He said remember that everybody wants to go to heaven and nobody wants to die and this issue I think really exemplifies that. We are going to have to deal with this. We can't just talk about it.

**Michael Niggli:** Part of the issue that I think I see here is electricity is actually part of the solution to the climate issues. We have opportunities in the transportation area, we have opportunities to go into renewables, we have the technology that ultimately we will

put in place to help us get there, I believe it's truly part of the solution. But in the meantime we really need something like a interstate highway system that is robust. It allows us to take advantage of the flexibility of the transmission system. There is great flexibility in that area in terms of moving power back and forth among the areas and creating a green highway. I think last thing I would say is that the 80-20 really works, 80-20 really works, we don't need perfection, let's move on and get something done in this process and we will see how it goes.

**Jeff Sterba:** I would just say the power that you all have by working together is really enormous, but it's only enormous if you take the ideas and the commitments you make with each other and force them through your individual chains. Because otherwise, it's just vision without action, so please act.

**John Fielder:** One just nit that I think adds perspective to the whole transmission debate. Today our customers pay pretty big bills but less than 3% of their bill is made up of transmission cost. So we argue over all of this stuff and it really is the flea on the tail that we are talking about, so you know moving this thing along is really important and it doesn't cost the customers a lot of money.

**Governor Napolitano:** I will be very brief but I will just share with you that one state not on this table today is California and we are talking about regional planning and regional costs and benefits, there's a very, that is a very large missing piece of this because their demands for energy and their lack of action over the past decades I believe should not be a cause born by Arizonans and others in the western region. So at some point you and I can talk about that line.

**Governor Freudenthal:** I would say in California's defense that they are the probably the only state in this region who has actually linked environmental objectives with public utility law. I want to express on behalf of all of the governors, our appreciation for the panel has been a very sobering and very thoughtful discussion about both on energy and climate future that presents remarkable problems for not just the governors but for colleagues from Canada. Your comments are ones that invite us to take some action going forward which I know Governor Huntsman is contemplating and we view you as stakeholders and partners in the development of what we hope will be some proposals for a new administration whoever they are. And so without asking your permission I am just going to draft you into the John Huntsman army of vision for the future and we look forward to working with you and thank you very much and we stand adjourned until tomorrow morning, is that correct? Thank You.