

Oklahoma Innovations Radio Show

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Guests: **Stuart Solomon**, president and COO, Public Service Company of Oklahoma; **Richard Sedano**, director, Regulatory Assistance Project; **James Woolsey**, venture partner of VantagePoint Venture Partners and former director of the CIA; **J. D. Strong**, secretary of environment, state of Oklahoma

[Music]

From the OCAST Radio Network, this is *Oklahoma Innovations*, a weekly science and technology radio magazine brought to you as a service of OCAST, the Oklahoma Center for the Advancement of Science and Technology. OCAST is the state's only agency whose sole focus is technology, its development, transfer, and commercialization. OCAST mission is to identify and fund promising research in technologies that allow Oklahoma to compete in a global market economy from our own backyard. This program features some of the state's most gifted and talented scientists, inventors, entrepreneurs, manufacturers, and business leaders who all have one common goal, developing technology-based economic growth for all Oklahomans. Now here are your hosts, Gary Owen and Steve Paris.

>> We are on the road once again this weekend. And this time, we are coming to you from the Cox Center in Oklahoma City. We are attending a conference here, which really is something we talked about several weeks ago. Oklahoma is ranked number two in the nation for potential wind energy production, and could supply 10% of the country's electricity needs by 2025. Now, to further inform and educate Oklahomans about wind energy, Revolution 2009: The Oklahoma Wind Energy Conference, was held in Oklahoma City December 2nd and 3rd. And we are taping this show from that conference. So by the time you hear the show, obviously the conference will have well passed. But the conference is being put on or sponsored by the Oklahoma's Secretaries of Energy, Environment and Commerce. Steve?

>> You're exactly right. We've got Robert Wegener, Oklahoma Secretary of Energy; J.D. Strong, who's the Secretary of the Environment; and Natalie Shirley, Secretary of Commerce, who are conducting this conference on behalf of Governor Brad Henry. And, you know, one of the things that we like to do when we attend these conferences is look at the guests who come, the people who are involved with energy production in the state of Oklahoma. And we've got a gentleman here who is the president and chief operating officer of public service company of Oklahoma. His name is Stuart Solomon. Stuart, welcome to the show.

>> Thank you. Good morning.

>> Good morning. We need to understand a little bit about who you are and your involvement, obviously as the head of PSO, which is kind of a mainstay in Oklahoma. It's been around a long time, provides electric service to a lot of people. And we'll let you explain where that is and how you became to be involved with it.

>> I sure will do it. I'm president and chief operating officer of Public Service Company of Oklahoma. We're an Oklahoma company, and coming up in 2013 on our hundredth year anniversary.

>> Wow.

>> So we've been serving Oklahomans for a very long period of time. Based in Tulsa.

>> Right.

>> And serve the eastern part of the state, as well as the southwestern part of the state.

>> Well, when you say coming up on your hundredth anniversary, I've heard of you for many, many years, almost as long as I can remember. But I had no idea it was almost a hundred years. That's fantastic. Give us a little history of PSO. How did you get started? Who started it and why?

>> PSO started as a collection of smaller electric utilities in towns, primarily in Northeastern Oklahoma. And it continues to grow and acquire more utilities across the state. We used to provide services such as ice, way back in the 1920s, and did some electric rail facilities in the McAlester area, for instance.

>> Okay.

>> So we used to do some other things. But now we're mainly just focused on providing electricity in a safe and reliable way to our customers.

>> And your customers number about a little over half a million.

>> We have about 530,000 meters, which we call customers.

>> Obviously more people.

>> About 1.7 million people across the state of Oklahoma.

>> Which is approaching, what, roughly a little more than a third of the population, maybe 40% of the population relies on PSO. Right now, you're generating your electrical energy from, what, coal fire?

>> Yeah, if you look at our energy mix, predominantly, we're going to be purchasing from natural gas facilities, from coal facilities. And then the purpose of this conference, of course, is wind. And we have an increasing percent of our energy mix, in terms of wind power. Most customers that we serve don't realize that about 12% of their own energy mix is made up by wind power.

>> Wow, interesting.

>> So it's a pretty significant contribution. We're fortunate here in the state of Oklahoma to be right in the middle of just a wonderful wind resource.

>> Of course.

>> So it's only natural that we and other utilities would want to take advantage of that, and we have.

>> You know, you hear some people wrongly say that the electrical generating companies really don't want have anything to do with renewable energy. That's not true.

>> I don't think that's true at all. And I think, you know, I give a lot of credit to the secretaries of commerce and energy and environment that have put on this conference. But I think you look at the attendance of this conference, and there's going to be more than 700 people at this conference.

>> Right.

>> And I think that's a clear indication that all the people that attend here and all the utilities that are here have a real commitment to increasing their share of renewable energy.

>> Well, let's talk about that. I know that there are always--anytime there's an opportunity, there's also some obstacles you have to sort of get around. It's just almost provided there by nature. And I know, you know, we talk about wind energy. Usually most of us think in terms of the big wind generators we see on the big wind farms that we've encountered in Western Oklahoma. Now, you all get some of your energy from those sources too, is that right?

>> Absolutely right.

>> 12% of that, would you say?

>> We buy from five different wind farms.

>> Okay.

>> A couple of them are just north of Lawton. There's one in Weatherford. And that's the one that's the easiest to see. If you're driving down Interstate 40, you can see wind turbines on both the north and the south side of the highway there. There's another one out by Ok City and then one north of Woodward. So five total.

>> I think I've seen every one of those. They're fascinating to watch. And they remind me of War of the Worlds when you're from some distance away, as seen coming over the horizon. But that's not what they are. They're generating electrical power.

>> Absolutely.

>> Yeah, let's talk about PSO, and let's talk about where you're going. Give us kind of a feel for how much wind energy you think that would become a part of the supply for your customers down the road. And how soon might that happen?

>> Well, we've got some opportunities there in the near term to increase wind. And we intend to do that. You look out over the next 10 years or so, the way we're going to meet increases in demand by our customers is largely through adding wind power. I think over the next few years, you'll start to see more and more solar power in the state as well.

>> Right.

>> So I think we've got a real opportunity there. You know, for many years, wind was really too expensive. And the costs have come down over recent years and made it economic for us to put it on our system for the benefit of our customers. I think the same thing is happening with solar. The costs are starting to come down. And very soon, I think we'll have the opportunity to add some meaningful solar power into our system.

>> Now, if anybody out there thinks that we're actually going to generate all of our electrical power with wind energy or all of it was solar, they're probably not correct. We're still going to rely on some of the fossil fuels. Most importantly, natural gas, are we not?

>> That's absolutely right.

>> Talk about that mix and how that works.

>> I think the most important thing for PSO, as an electric utility, is for us to maintain a balance in our energy mix, to maintain diversity. We don't want to be overly reliant on any one fuel, whatever that is. So let's have a mix. And that's what we've done. As I mentioned, we've got gas and we've got coal and then we've got wind in our portfolio. No single fuel can be relied on. Because each of them have their pros and their cons. And they have to be mixed together. From a wind standpoint, everyone knows that there is variability in the wind production. Wind blows, and then at other times, it doesn't blow.

>> It doesn't blow as much.

>> So if you're 100% wind, and the wind stops blowing, then lights go out.

>> You've got a problem.

>> We've got problems. So we can't do that. But it is a very nice compliment to what we already have, in terms of gas units, in terms of coal units.

>> Well, this conference is not targeted toward our traditional sources of energy, such as natural gas. But natural gas is really just now we're hoping soon will come into its own in Oklahoma for a lot of reasons. But electrical generation is what we use it a lot for electrical generation. But that's one of our--well, it's not, you know, it's not renewable. We have a huge supply of it. And I'm sure your company knows that, and is looking at it as a big part of the mix, as far as electrical generation. How do you see that changing?

>> Well, it's been our number one fuel source throughout our existence. We rely on natural gas more than anything else, buy a lot of natural gas and burn it in our facility.

>> It makes a lot of sense.

>> We have a lot of it, it's a clean fuel, so it makes a lot of sense, particularly here in the state of Oklahoma. I expect that to continue. We're adding some more gas. The next large purchase that we've made will take effect in 2012. We're buying power out of an existing gas facility in the Tulsa area that will make our slice of the pie that's represented by natural gas even larger. And so we think that natural gas has a huge and very important future, just in terms of electric generation, and in terms of what it can do to compliment wind. One of the things that gas units have is a lot of flexibility. We can bring those gas units up, bring them down, as necessary, to match whatever else is going on on the system.

>> Sure.

>> And when the wind is changing from weather patterns, or whatever makes the wind go up and down, gas units are the types of facilities that we can utilize to match that, to make sure that we back it up. Because with an electric utility, with our electric system, we have to have a perfect balance between how much the demand is and how much the supply is at all times, or the system fails.

>> Of course. Now, I want to ask a question. This is a consumer question. Because a lot of people don't have an understanding of how this all integrates. So, for example, those of us that may live in rural areas of Oklahoma that you serve, when you talk about wind power and gas and how this all balances out, technically, just a broad perspective here, what happens? Are there switches and computers that make things switch over, so when wind power quits, gas goes on? How does that work technologically? Is there a way to explain that?

>> Well, we have some very smart operators across our system, across the country, who make the whole electric system work. It's really an amazing thing.

>> That's called a grid, right?

>> It's called the grid, which is all the generation facilities that are attached to transmission lines. And ultimately, power flows through distribution, smaller lines into homes and businesses. And we have people that manage it, just like air traffic controllers manage airplanes flying around all over the place, they manage that power flow coming into the system and being delivered to consumers. But if you look in the morning, as demand starts to increase, those operators will increase the production out of our generation facilities. And at night, when demand starts to fall again, those production facilities start to decline. And they have to, again, keep it matched up at all times. It's an amazing thing what they do.

>> Because you represent a power company, we've had on a recent show, we talked about the distribution of wind power outside of our state. How do you feel about that and the future for Oklahoma's economy?

>> Well, from an economic development standpoint, I think Oklahoma has a huge opportunity with wind. We have far more wind capability in this state than all of our citizens here can use. So that gives us an opportunity to export it to other states. There are a lot of other states that aren't blessed with the kind of resource that we have. And if we have new federal requirements that require a certain amount of the energy mix in a given state to be produced by renewable power, or as we deal with environmental restrictions, regulations going forward, it's important that all areas of the country have access to renewable power. We will have that resource. We will be able to deliver it to them across the country.

>> Outstanding. Public Service Company of Oklahoma. Tell us a little bit about your company, how many employees you have. And you've mentioned the area of it. You've got both rural and urban Oklahoma in Tulsa. And then you've got Southwestern Oklahoma. Talk to us about your employees and just kind of how widespread this organization is.

>> Sure, again, about 530,000 meters, 1.7 million people we serve in the eastern part of the state, all the way from the Kansas line down to the Texas line over to Arkansas, and then in the southwest quadrant as well. We have about 1,700 hardworking employees all across the state. And we do serve both urban areas, as well as the more rural areas in Tulsa and McAlester, Lawton, Bartlesville, those communities.

>> Very good. We're kind of getting down toward the end of this segment. I want to know a little bit about your history. I know you've been in Texas, you've been in Colorado, and you've been in, what is it, Virginia, West Virginia. And where is home for you originally?

>> Well, lived all over the place. But I've been fortunate enough to be in this industry, and working for affiliated companies to PSO that entire time. So my entire career has been not only in the utility industry, but working either for PSO or for related companies.

>> Yeah, I guess Tulsa is home, is that right?

>> Tulsa is home for ourselves and our family.

>> Steve and I are coming to you from Revolution 2009. More to come from the Oklahoma Wind Energy Conference on *Oklahoma Innovations*.

[Music]

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>> Welcome back to *Oklahoma Innovations*. Steve and I coming to you from Revolution 2009: The Oklahoma Wind Energy Conference, which, again, by the time you hear this program, the conference will be over. But the information that you're going to hear on the program today is fascinating about Oklahoma's future in wind energy. Steve?

>> Thank you, Gary. Richard Sedano is Director and Principal of the Regulatory Assistance Project. Spoke to the group today, one of our guest speakers. And he has some very interesting thoughts about energy efficiency as a part of the overall picture, as we redesign how we use energy, both in Oklahoma and around the country, or maybe even, to some extent, around the world. I'm going to let you tell a little bit about yourself, Richard, because you probably can say it a lot quicker than I can. And we don't have a lot of time here.

>> Nice to be here. Well, I was from state government in Vermont. For a long time, I was Commissioner of the Department of Public Service. And now I work with a public interest organization called The Regulatory Assistance Project, which is a mouthful, but basically we help states with energy policy.

>> Developing energy policy, is that right?

>> Well, developing, but also wrestling with the dilemmas that are embedded in it. That's the tough part.

>> Yeah, yeah. How are we in Oklahoma? Because you've worked on a project that involves collaboration in Arkansas and Oklahoma.

>> Well, I spent many, many days in Oklahoma last year as part of a corporation commission collaborative on energy efficiency. And I think I was able to help the utilities and others come to terms with some of the things they had to do to get energy efficiency programs, which are going to help Oklahomans get started.

>> Let's talk about energy efficiency. All day long, we've talked about, you know, different types of energy, how it's developed and where we are. But we have not talked much about on the efficiency side of it. That's a very key part. Tell us about that.

>> Well, of course, the supply is only there to serve we customers. And we customers are using electricity. And we want to be comfortable. And we want to do what we want to do. And there's a lot of waste in the way we do those things. And so what we can do is a few things to help customers figure out ways to use energy more effectively. These are called programs, basically, strategies to get customers to do things a little bit differently with their buying and the way they use energy.

>> Right.

>> And in that way, if we can be very effective on that, then we need a lot less capacity for generating electricity. And that means less rate increases, less transmission lines that are going through our countryside, and a lot less trouble. You know, in this country, we're talking about new nuclear power plants, new technologies for coal, in addition to massive wind build-outs that are going to need transmission, and significant increases in natural gas. We can alleviate the pressure that we're putting on ourselves if we do a lot more energy efficiency.

>> We need to become smart about how we use the energy that's available to us.

>> Well, customers would be better off if they were smart. But the fact is that we're all people. We have busy lives, we have kids, we have jobs, we have our lives. And so for a lot of people, we don't think about this. Or maybe we know that there's something more we can do, but we need some help in figuring that out. Maybe we need a helping hand. And maybe some people are a little short of some money.

>> A lot of it is education and awareness, too, of usage, because people don't think about it. And it's something as simple as turning lights off. You know, when you're out of a room, I know a lot of people that just leave lights on when they're not being used. Just little things like that.

>> Yeah.

>> I'd like for you to tell some of the specifics about what you've discussed with the people who generate energy here in Oklahoma. What kind of things are we looking at?

>> Well, of course, we can ask people to be better people.

>> Some will, some won't.

>> And some will, and some won't, that's right. I think there are a few things that we can do that are maybe more strategic. There is something called a smart grid, which the federal government is about to grant a lot of money to a lot of utilities around the United States to deploy, which basically will use computers and communication systems ultimately to help consumers understand how their buildings work, and perhaps automate some of the things that are going on in the house, so that you can program your preferences into how your air conditioner works or how your water heater works, maybe your lights. In a commercial building, there are a lot more opportunities. And if you program all of that stuff in to identify your preferences, then that will just happen.

>> So computerized energy management, it sounds like.

>> There can be a lot more of that. And this is--we're just scratching the surface as a society for that.

>> Well, I recently received my electric bill coupon to go out and buy one of these new light bulbs.

>> Compact fluorescents.

>> Compact fluorescents, thank you.

>> The twirly ones.

>> And I'm a sucker for a coupon. I've got to go buy some of those. I do have some in my house already.

>> Well, they're getting cheaper and cheaper and performing a lot better too.

>> That's right.

>> So it's easier to use them. Another important issue, though, are the business incentives that our companies have. Our utilities make money by selling electricity. So if we now think about how maybe it's better for society if we use less energy, where does that put the utility of it?

>> Less money.

>> Well, unless we change the way we regulate them.

>> Right, exactly.

>> And there are ways to we can change the way we regulate them. We want to be sure that the utilities recover costs that are necessary to serve us reliably. So they've got the poles in the ground. They've got the wires in the air. They've got all the trucks that they need to come out and deal with problems and all the people on the phone answering our questions. We've got to pay them for that. The question is, if we buy less energy, they sell less energy, does that put them into a problem? We have to have a regulatory process, and we can, that will not put them into a problem, that will make them embrace energy efficiency, if it's the right thing to do, which I think it is.

>> It's just a matter pretty much of looking at it from a different angle, and finding ways to incentivize, you know, this efficiency we're talking about. You've got just about a minute. I know you've been dealing with people here in Oklahoma at very high levels of energy production, people who run energy production companies, electrical generating plants, things like that, and state government. Let's look down the road five, ten years, where are we going to be as far as the way we operate our homes and operate our cars and the things that use energy?

>> Well, I think it's likely that there's going to be carbon regulation in the United States. And I understand that there's differences of opinion about whether there ought to be, and how we should do it, if we should do it. But I think if we look down the road 10 years, there's going to be carbon regulation. We're going to be driving our decisions based on carbon regulation. And so more and more people are going to be making choices with that as an influence.

>> Coming up, when we come back to the Oklahoma Wind Energy Conference, we're going to be speaking with a keynote, James Woolsey, former director of the CIA, when we return on *Oklahoma Innovations*.

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>> Now in its 14th year, this is *Oklahoma Innovations*, on the OCAST Radio Network.

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>> Steve and I are on the road once again. And we are coming to you from Revolution 2009: The Oklahoma Wind Energy Conference. This conference features nationally-recognized experts, including Marc Spitzer, the Commissioner of the Federal Energy Regulatory Commission; Denise Bode, Chief Executive Officer of American Wind Energy Association; and our next guest, James Woolsey. He's a venture partner and senior advisor at VantagePoint Venture Partners. And he's also former director of the CIA, Steve.

>> Yes, he is. And we welcome you, Mr. Woolsey, back to *Oklahoma Innovations*. I think we interviewed you about two years ago.

>> I think that's right.

>> At one of these conferences. And we might want to point out, too, especially to our listeners in the Tulsa area, on KRMG, you're a native of Tulsa.

>> Born and grew up there, went to Tulsa Central.

>> Tulsa Central, which is now the headquarters for Public Service Company of Oklahoma.

>> It is, indeed.

>> And they have a presence here at this conference. So things kind of have a tendency to come around and around. Let's talk just a little bit about the subject when you addressed the group here just a little bit ago, you were talking about wind, solar, natural gas, the affordability, how clean it is, security. Things are changing. It's getting better. Tell us about that.

>> They are. Well, Oklahoma, I think a short version would be, is sitting pretty. Because I think the three most promising areas for evolution of energy production are, in fact, natural gas, solar and wind. And all are improving with respect to price. The large shale deposits we're finding all over the country, and some in Europe, as well, for natural gas. So it looks like it's going to hold the price of gas down and make gas very attractive. Gas plants cost much less to build than coal fire plants, and much, much, of less to build than nuclear plants.

>> And they're cleaner.

>> And they're much cleaner certainly than coal. Nuclear is clean in terms of CO2 in its operation. But you do put out some carbon and so forth, different parts of the mining and construction process, and so forth. So gas also is a good companion for solar and wind, because they're intermittent, and gas can be turned on and off a lot more easily than most any other kind of energy. It's I think also the case with more and more of the gas found in the U.S., at least a portion of the ideas that came up with of using natural gas for fleet vehicles where you have central facilities, like say school buses.

>> Right.

>> And perhaps for interstate trucking where you just have to put in natural gas pumps, essentially, at the big truck stops, makes a good deal of sense. I'm not a fan of using natural gas for the family car, because you need a big new infrastructure and big gasoline stations.

>> And that's very expensive to build that, isn't it?

>> Yeah, I think. But the infrastructure we've got for transportation is, and it can be used for transportation, is increasingly electricity.

>> Right.

>> I drive a Prius that's been converted, not just via hybrid, to be what's called a plug-in hybrid. It has an extra battery, five kilowatt hours, about 250 pounds worth of battery. But because of that, I can charge overnight 40 cents worth of electricity. And I use a tiny bit of gasoline, the first 30 miles or so the next day. Last time I measured, it was 11 cents. So for essentially 60 cents, I drive 30 miles. And then I just become a regular Prius. Just a light flashes on the dashboard. I don't have to, you know, find an electric socket or anything. Well, three quarters of the cars in the U.S. go less than 40 miles a day. And well over half go less than 25 miles a day. So you're driving at two cents a mile when you're driving on electricity, at those kinds of overnight prices. And you're driving about 10 cents a mile if you're in a 25-mile-a-gallon car with \$2.50 gasoline. So being able to produce electricity from the renewables and from gas cleanly, and use it to replace oil products for a large part of your transportation, and to some extent, using gas itself to replace oil, has a lot of really attractive features about it, in terms of national security, relying less on the Middle East for our energy, in terms of cost. I mean, you know, maybe you don't care about Middle East and the security issues, and maybe you don't care about climate change, but the fact that you can drive for two cents a mile for the first 30 or 40 miles a day instead of ten cents a mile ought to get anybody's attention.

>> It's a wonderful story. And you talk about security. If anybody's had any experience with national security, you're a native Oklahoman. You're one of Oklahoma's favorite sons. I would declare that. And as such, you probably have been in a position where you have a better feel for national security and how it relates to energy, or as good as anyone. And let's talk about that just

a little bit. I mean, I don't know if you have any specific numbers. But we'd like to wean ourselves away from foreign oils. And how can we--what level could we--

>> There's one very big number, with \$75, \$80-a-barrel oil, we are borrowing over a billion dollars a day just to import oil.

>> Wow.

>> Over 365 billion a year. Now, if you can replace that with domestically-produced oil, you help with the balance of payments, okay? But it doesn't help much else. Because the low-cost producer for the foreseeable future is going to be in the Persian Gulf, mainly Saudi Arabia. And that means OPEC is going to control the price.

>> Right.

>> Now, the world that I grew up in, driving our old Buick in Tulsa in the 1950s, on dates in high school and so forth with 25 cent-a-gallon gasoline, that was pretty good. And that was partially because the Texas Railway Commission was OPEC back in the 1950s and 60s and into the 70s. And although, you know, we're from Oklahoma and they're from Texas, we'd get along. And they actually were pretty good, OPEC. But now that OPEC and OPEC, they keep the prices high as they possibly can.

>> Sure. And they don't want competitors. So occasionally, they'll drop the price the way John D. Rockefeller used to, the way they did in the 1980s, and again in the late 90s.

>> Dropped everybody out.

>> Dropped everybody out of business, and then came their price back up again. Well, so as long as we're on oil, the low-cost producer, and that's OPEC, is going to be setting the price.

>> Right.

>> It doesn't matter that much if let's say we buy more from Canada and less from Saudi Arabia. Somebody else is going to buy less from Canada and more from Saudi Arabia. There's one worldwide oil market.

>> Right.

>> So although we help with our balance of payments by moving to domestic production, we don't really do much by changing the trade patterns of oil. You've got to essentially move away from oil dependence, not just foreign oil. My friend, Andy Coren, who I write with occasionally, has a great analogy. He says, well, gee, that's what we have to do is turn oil into salt. He says, salt was the strategic commodity until the beginning of the 20th century. It was the only way to preserve meat. Countries went to war over salt mines, believe it or not. Biblical phrase, you're the salt of the earth means you're important, not that you're cheap. And today, we're going into lunch in a little bit, there will be salt on the table. Will any of us look at it and say, gee, are we salt-independent? I wonder where that comes from. Is it imported from abroad? We don't care. It's a regular commodity bought and sold at international commerce. So we don't need to destroy oil. We just need to destroy its strategic importance.

>> There you go.

>> And we can do that, I think, by a combination of electrification of transportation, using natural gas for some parts, using algae-based oils for some, it is, for diesel and aviation fuel,

maybe using some other kinds of new biofuels and improving fuel efficiency overall. Do that, and focus on clean, natural gas, solar and wind, especially, increasingly for our electricity production. And I think Oklahoma could be among the leaders in moving us toward a much brighter energy future than we've got now.

>> Outstanding. Now, one of the things that you talked about is all of these different items. There's no one single answer, simple answer. It's a combination of solutions.

>> Sure it is. But I don't think it's equally go-forward with just everything. For example, carbon capture and sequestration for coal, that's something we ought to do R&D on. But, you know, that's going to require an infrastructure as big as all of our current oil and gas pipelines together in order to do something about moving CO2 around the country that way. Nuclear has some real advantages in cleanliness. Very expensive to build. Of course, quite cheap to operate. But the problem with nuclear is the current kind of light water reactors we have, if the companies that build those start selling them all over the world, which is what they need to do in order to make money, and you end up with light water reactors in say Saudi Arabia and Egypt and Turkey. Those countries with the current types of reactors, once they're in production, they can enrich uranium, reprocess plutonium legally.

>> Yeah.

>> And they are very, very close to having nuclear weapons. The design of the nuclear weapon is unfortunately not that hard. The hard part is getting the highly-enriched uranium. And if you're in the fuel cycle, as almost all of these countries are, as North Korea was, as Iran is, you have real trouble.

>> You work with investors. And let's talk about the investment community. And we don't have much time. We have about a minute here. Let's talk about the investment community and the role that they're playing right now in energy, in developing our energy resources.

>> It's still moving along as a venture capital. That is, cash for equity investments in start-up companies, a lot of innovation, a lot of that's going reasonably well. The problem is with our current banking crisis, still the banks really aren't lending. And with the high unemployment, the difficulty is finding the financing to take things up to scale and to move it along into large-scale production. The lending is really just not there. And that's a serious problem.

>> Yes, it is.

>> James Woolsey as our guest this segment. We're coming to you from Revolution 2009: The Oklahoma Wind Energy Conference. And when we come back, we've got a lot more to talk about. Stay with us on your science radio magazine, *Oklahoma Innovations*.

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[Music]

>> We are back at the Oklahoma Wind Energy Conference. It's actually called Revolution 2009. Some interesting statistics, Steve. Recently, a poll taken by Cole Hargrave Snodgrass & Associates in Oklahoma City revealed that 91% of Oklahomans approve of the further development of wind farms for producing Oklahoma's needed electricity. And to quote Oklahoma's Secretary of Energy, Robert Wegener, Oklahoma is ideal for wind energy development. You think?

>> Well, I believe it is. I think it's catching on. All you have to do is drive through many parts of Western Oklahoma and you see these wind farms that are generating electricity on behalf of Oklahomans. Actually, I think some of that energy is being sold into the grid outside of Oklahoma. So this is a tremendous economic benefit for all of the state.

>> That's right.

>> And you're going to see more and more, I think, emphasis placed on this. Of course, there are limits to everything. You know, we have another secretary, Secretary J.D. Strong, Secretary of the Environment for the state of Oklahoma, serves on Governor Brad Henry's team on his cabinet. And you're the fifth secretary of the environment. And you, along with two other secretaries, Robert Wegener and Natalie Shirley, you sponsored the conference we just had here at the Cox Center in Oklahoma City. And we would kind of like for you to give us, kind of from the standpoint of the second of the environment, kind of an overarching approach of what did we accomplish at this conference?

>> Well, certainly, obviously any member of Governor Henry's administration is interested in jobs and economic growth for Oklahoma. So certainly there's been a great focus on that aspect of it, both in our conference and just in our day-to-day operations as we try to attract more and more wind energy development to Oklahoma, both the development of wind farms and the jobs that those bring, as well as manufacturing jobs, the people that actually make the equipment. And so in addition to that economic development and job potential side, I, as secretary of environment, obviously have a keen interest in the environmental benefits of wind energy, and it being really the paramount green energy that's out there, in terms of looking at all of the other types of fuel sources and ways to generate electricity. There really is no way to generate electricity that's more beneficial to the environment than through wind energy. And so as we hear the debate raging in Washington over greenhouse gases and global warming and carbon regulation, which undoubtedly will happen very soon, and which will drive the price up, frankly, of coal, natural gas and other of our conventional sources of electricity, is going to mean that the states that are prepared are going to be the states that can generate more of their electricity from sources that do not generate carbon. And wind is a great example of that. And it just also happens to be a fuel source in our state that's very prominent and prevalent across our state.

>> There you go. And, you know, there's really not bad people in this issue. When we have issues with the environment, it's usually a habit that we, as a society, developed years and years

ago. We're just now learning that sometimes it harms the environment. And I know, from your standpoint, you want to make sure we have a clean environment. But we also don't want to stop development of things like wind energy, things of that nature. You mentioned that wind energy is one of the cleaner, and I believe that, it's obvious, but it does have a few issues.

>> Sure.

>> And one of them you talked about at this conference, I believe you did, anyway, at least you talked about it with some folks, about the prairie-chicken model. Now, I know we went from kind of an overarching concept down to the little prairie-chicken, which you find out mostly in Western Oklahoma. And tell us about the prairie-chicken model, and kind of what that means as far as working on that project.

>> Well, and certainly you're exactly right. As with any development on the landscape, there are impacts. And with wind energy, really the greatest impact is with regard to wildlife impacts. And there are sort of the standard bird and bat collision issues that the industry is dealing with nationally. And to a great extent, dealing with that issue pretty adequately in Oklahoma as well.

>> Sure.

>> So the one unique issue that we have in Oklahoma and four other states around us really is this lesser prairie-chicken issue. And the issue with the lesser prairie-chicken is that it has evolved over tens of thousands of years on this prairie to learn to avoid any tall structures on the horizon, because they've learned that those are perches for predatory birds, hawks and stuff like that. And so anytime something tall is erected on the landscape out in prairie-chicken country, they go away. And that's extremely troubling with regard to the lesser prairie-chicken, because we've already lost 90% of the prairie-chicken population in Oklahoma, just over the development that has occurred since statehood, essentially.

>> Sure.

>> And so it also happens that the very best wind resource in our state overlays almost exactly with that last remaining prairie-chicken habitat in our state. And so we recognized this very early on as a major challenge and a possible impediment because the lesser prairie-chicken is a candidate species for listing on the Endangered Species Act. If that happens, then the federal government becomes involved in decisions that are made about how we develop our landscape. And certainly, Oklahoma land owners aren't going to appreciate their involvement in their land use decisions. But even we, as, you know, government folks in the state, with dearly love to keep those decisions local, or at least state-based ourselves. And so we worked with wind utility folks, beginning last year, to develop a planning tool, if you will, that really helps them identify, as they plan their wind projects, those habitats that are most critical to protecting the lesser prairie-chickens so that they--we figured knowledge is power. And them knowing that upfront, they might make some different decisions than they might otherwise make. But at a minimum, it also shows them what it costs, kind of what the mitigations costs were, so if they do build a wind farm in this habitat, this very critical habitat, that they understand what the cost is to replace that habitat for lesser prairie-chicken to keep that population viable. And so we definitely talked about that at the wind conference, and, in fact, announced the next--within the next few days, what we hope will be the closing of a very significant property that has extreme value to lesser prairie-chicken, almost 4,700 acres that is adjacent to the existing Packsaddle Wildlife

Management Area that will be purchased, utilizing mitigation funds that OG&E contributed to the state for the development of their latest wind farm up in that area.

>> So those were real viable solutions to issues that we didn't even think about when we first started talking about wind generation for electricity.

>> Certainly.

>> Yeah. And so here we are. And I know that's not the only issue. I know there are others that you have to deal with. But it's gratifying that you're dealing with it, because those are issues, you know, if you haven't been to the lake, which is where prairie-chickens live, it's an experience you need to have, at least one time.

>> Yeah.

>> Fascinating place. Well, let's talk a minute about, you know, we've had about 800 people, 7-800 people at this conference, which is well-attended, some of them from out of state.

>> Yes.

>> And I think--I detected a lot of interest from the folks we talked to. And kind of give us an idea of where, five years down the road, five, ten years down the road, where are we going to be in wind energy development or alternative energy development?

>> Well, hopefully Oklahoma, you know, in fact, already is sort of surging ahead as a leader in this area. But hopefully we will be well-established as a leader in renewable energy, but in particular, wind. I mean, that is the one renewable resource that we really have in our arsenal. As everybody that has spent any time in this state knows, the wind definitely comes sweeping down the plain here.

>> Yes, it does.

>> And so we, in fact, saw a report released last year from Department of Energy that said if the nation is going to get to 20% of its power coming from wind by the year 2030, that Oklahoma would be one of the top two states in the nation, in term of wind power, wind-generated power. And so we definitely talk at the wind conference and will continue to do things both through the conference and working with the governor and the legislature to ensure that we realize that goal at least of being a top two state.

>> One of the things we have not talked about, and we don't have a whole lot of time left, but one of the things we have not talked about is the benefit for land owners in western, specifically Western Oklahoma, but other places too. You know, agriculture has its ups and downs, and always has, and probably always will. But one of the things that we have now that is an alternative source of income is leasing your property for wind energy development. Kind of where are we on that?

>> Well, certainly, you're exactly right, especially in a part of our state, Western Oklahoma, where we see population declined and people struggling to make ends meet, this presents another opportunity for royalty payments, other things that some folks are used to already in the oil and gas side of the business. And so wind offers that opportunity for our land owners in rural Western Oklahoma, as well.

>> Very good. Gary?

>> I'll tell you what, we have learned a lot at this conference. And I hope that this has inspired Oklahoma to get more enthusiastic about the promise for the future of what wind energy and the resources and benefits it will produce for us in the future. Because it's a benefit, of course, in alternative energy source, as well as economic development for our state. Job creation, great opportunities for land owners. I just see a lot of stuff.

>> I know something you learned.

>> What?

>> You learned that prairie-chickens live in lakes.

>> That's right, I did. We've got to get out of here. We've had a great time. Want to thank you for joining us on this week's edition of *Oklahoma Innovations*. Steve, see you next week.

>> Okay, Gary.

[Music]

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