

**CAPITALIZING ON RENEWABLES FOR
OREGON'S ECONOMY**

FIELD HEARING
BEFORE THE
SUBCOMMITTEE ON TRADE, TOURISM, AND
ECONOMIC DEVELOPMENT
OF THE
COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE
ONE HUNDRED NINTH CONGRESS

SECOND SESSION

AUGUST 16, 2006

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ONE HUNDRED NINTH CONGRESS

SECOND SESSION

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CAPITALIZING ON RENEWABLES FOR OREGON'S ECONOMY

WEDNESDAY, AUGUST 16, 2006

U.S. SENATE,
SUBCOMMITTEE ON TRADE, TOURISM, AND ECONOMIC
DEVELOPMENT,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Eugene, OR.

The Committee met, pursuant to notice, at 9:30 a.m. at the Lillis Business Complex, Hon. Gordon H. Smith, Chairman of the Subcommittee, presiding.

OPENING STATEMENT OF HON. GORDON H. SMITH, U.S. SENATOR FROM OREGON

Senator SMITH. Thank you very much, Dean, and please extend to President Frohmeyer my admiration and my gratitude for the University of Oregon's hospitality in allowing the Senate Commerce Committee to conduct this hearing here.

I think it is doubly appropriate that we are gathered in such a remarkable and green building. We are here to talk about the environment and we are here to talk about energy. We're here to talk about how we can unite those two causes and great concerns to our country's future.

As I travel around Oregon, I do sense a lot of economic insecurity, and it often is highlighted to people when they go to the gasoline station and fill up and they wonder what does the future hold.

So as we look to the future, I think it is very important for those of us in national office who have an ability to do something about it, to start doing something about it in a very aggressive way.

That's why I sit on the Energy Committee, with Senator Wyden. I also chair a subcommittee on Commerce, and the Commerce Committee certainly overlaps this area of such vital concern.

I think it is also a credit to our state that we have always had a concern with the environment and the economy and tried to find a balance on those two things.

Oregon is in the vanguard of environmental responsibility, and yet we have economic needs as a people.

What we're going to talk about today is a sustainable industry that can meet our future energy demands and provide living wage jobs for Oregonians. Oregon's communities, its universities and businesses are pursuing a wide range of renewable energy sources from waves to wind to bio-diesel to cellulosic ethanol.

Some of you may not know what the differences are, but there are differences. Yet we produce them all, and can truly be a national leader in finding alternatives in renewable energy.

We will hear from two panels of witnesses who will discuss various renewable technologies being pursued today in Oregon and how they will affect the revenues and economic development plans of local governments.

You know, I've never yet voted on a perfect bill in my 10 years in the U.S. Senate. And each time you go to decide yes or no, you weigh whether or not the good outweighs the bad and try to avoid letting the perfect be the obstacle to good progress.

I think such is the case with the Energy Policy Act of 2005. It had some features that I did not like, but it had many features that I think clearly advance a green future when it comes to renewables and alternative energy sources. And there are certainly many opportunities for Oregon entrepreneurs to take advantage of the Energy Policy Act.

A number of provisions in this Act that I specifically authored or supported include the following: Investment tax credits for fuel cell power plants, residential solar water heaters and photovoltaic equipment; extension and expansion of the Section 45 tax credits for the production of electricity from eligible renewable resources; creation of the Clean Renewable Energy Bonds For Consumer-Owned Utilities Act; and tax credits for alternative motor vehicles and alternative refueling properties.

The Act also includes an ethanol mandate for fuel manufacturers that includes a specific amount of cellulosic ethanol. Oregon is filled with cellulosic biomass to be produced into ethanol.

I realize that a number of these provisions have sunset dates, and that makes it difficult to get facilities in place and service in time to meet eligibility windows.

Nevertheless I'm committed, as are many of my colleagues, to ensuring that these tax incentives are extended and are available to help launch these innovative technologies. Clearly capital businesses and entrepreneurs, need to have enough lead time in order to make investments and bring these facilities online.

I'm also pleased that the Energy Department is finally taking some key actions to implement this Act. In the past two weeks, the Department announced that it will spend \$250 million to fund new bio-energy research centers to enhance basic research on cellulosic ethanol and other bio-fuels.

In addition, the Department has announced that it is seeking proposals under the loan guaranty program that was created under the Act for innovative energy technologies.

I hope that interested parties in Oregon will carefully examine this program and see if they can utilize this new funding mechanism. There's money there to be used and it's waiting for entrepreneurial proposals that can take advantage of it. And few places are better situated than Oregon for that to happen.

Switching to the transportation sector, this is where I think America simply has to get on a different road. We remain addicted to oil. Increasingly that oil is being imported from nations who wish us ill and would do us harm.

I hear few comments more consistently around Oregon than those regarding the weariness of Oregonians to spending money to buy oil from nations that buy bullets to shoot back. We simply have to get beyond that.

When the 1973 oil embargo was imposed, the United States was importing 36 percent of the oil we use. Remember that number. In 1973, our imports were 36 percent. Today, oil imports are over 60 percent and rising. They are projected to remain above 60 percent for as far as the eye can see.

But that in my view is unacceptable. We need to reverse this trend that is so damaging to our national economy and our national security.

There is another aspect of what these imports mean to our economic health. Do you realize that fully half of our current account deficit, our trade imbalance, is due to foreign oil? And I don't know about you, but I don't see much future in Hugo Chavez, the dictators of Nigeria or in Iran or other places that currently supply so much of the oil to the West.

Bio-fuels represent a home grown option. They can be a direct replacement for petroleum products. I'm pleased that there's already one bio-diesel plant in operation in Oregon, and that about a dozen other facilities are in the planning stage.

In addition, six ethanol plants with a total capacity of over 200 million gallons per year are well into the planning and approval process.

We must also raise the fuel economy of the vehicles we drive. I believe this can be done without sacrificing consumer choice or family safety and without sacrificing American auto jobs.

That's why I have joined with Senator Barack Obama of Illinois and several of my colleagues to introduce S. 3694, the Fuel Economy Reform Act of 2006. This bill sets a 4 percent per year target for increasing fuel economy standards for automobiles and light duty trucks.

If we can do that, folks, we will get out of the grip of some of the worst tyrannies on Earth.

We have every economic incentive to do so, and we certainly have a national security reason to do so. We must push the domestic auto industry to use available technology to increase fuel efficiency. The stagnation of the U.S. auto industry has resulted in the loss already, with their current offerings, of 250,000 jobs since 2000.

Auto parts industries here in America have also suffered these kinds of losses. With gasoline remaining at \$3.00 per gallon, families and small businesses need better gas mileage from their cars.

It's interesting, when Ron Wyden and I were in China last December, we met with a Chinese official who stunned me when he told me that in the city of Beijing alone, there are a thousand new cars added to the streets of Beijing every day.

And if you contemplate what that means, is that when nations develop middle classes, those people begin to do what we do, and that is enjoy the freedom of an automobile.

I first visited China in 1984 on a business trip. It was like going back in time, almost to a stone age. And yet today when we visit China, it is remarkable. They have literally built eight beltways going out from the city of Beijing. And yet they're all parking lots.

There's not much moving. It is a shocking thing. The levels of pollution there are also incredible.

India is in a similar situation. That's why, frankly, I don't see a barrel of oil coming down. I really don't.

So, our alternative is to grow our way out of this with alternative energies that come off of American farms and forests and other sources.

I remember the movie "Back to the Future," where the crazy scientist is stuffing cans into the car and that made it go.

Well, we've got to tap the brains of our scientists to start looking for these kinds of alternatives, because we don't have much choice. And our Nation is counting on us to lead.

So, in closing, here in Oregon we have waves, wind, water, sunshine, and biomass. We also have geothermal, which we have hardly tapped in our state, but we've got a lot of it. Climb Mt. Hood with me, and I'm not saying you will build a geothermal plant on Mt. Hood, but there is a lot of steam coming out up there. That's an active mountain. And there are lots of fissures of geothermal where we may be able to take advantage of this natural resource that is certainly here with us and for a long time to stay.

We also have brain power in Oregon. We've got great universities like this, and entrepreneurs who are committed to these sustainable resources.

So, I look forward to hearing from each of our witnesses today. And I truly thank you for taking the time to add to my understanding, and the understanding of the people who are here. I know from your testimony that I have seen, you will add measurably to the record of the United States Senate and our understanding of how best to get beyond where we are.

So with that, we will turn to our panel of witnesses. Let me properly introduce you. I've got to put on my glasses now when the print gets smaller, because I've lost my eyesight in the service of my country.

Mr. Ron Suppah is a friend of mine. He is the Chairman of the Confederated Tribes of the Warm Springs Reservation. Thank you, Ron, for being here. Mr. Stan Watters is the President of Pacific Power in Portland, Oregon. Mr. Eric Simpkins is the Vice President of Business Development at IdaTech in Bend, Oregon; a great company there. And Mr. Scott Spettel is the Power Management and Planning Manager, Eugene Water and Electric Board here in Eugene. Thank you, Scott. And Annette von Jouanne is a Professor of Electrical Engineering and Computer Science at Oregon State University in Corvallis. Are beavers allowed here? I'm glad you're here.

So, thank you all, and you constitute our first panel.

So, Ron, why don't we start with you, and go in the direction as you were introduced.

**STATEMENT OF RONALD SUPPAH, TRIBAL COUNCIL CHAIR,
THE CONFEDERATED TRIBES OF THE WARMS SPRINGS
RESERVATION OF OREGON; ACCOMPANIED BY WASCO
CHIEF NELSON WOOLETON, JIM MANNION, RALPH MINNICK
AND CAL MUKOMOTO**

Mr. SUPPAH. Maswepa, Senator.

Senator SMITH. Thank you.

Mr. SUPPAH. I would like to take a minute, if I may, to introduce our Wasco Chief Nelson Woolleton, and some of my technical advisors, Jim Mannion, Ralph Minnick, Cal Mukomoto, and I'd like to, if I might, refer any technical or other questions to my staff.

Senator SMITH. We welcome you all, gentlemen. Thank you for coming.

Mr. SUPPAH. Don't go to sleep on me now.

Senator SMITH. Oh, I won't. That happens to me. It won't happen to you, Ron.

Mr. SUPPAH. My name is Ron Suppah. I'm the Tribal Council Chairman for the Confederated Tribes of the Warm Springs Reservation of Oregon.

Thank you for inviting me to come and testify about how renewable energy provides opportunities for direct economic development and in meeting Oregon's and the Nation's energy demands.

For the Tribe renewable energy projects, in particular woody biomass, grain and hydroelectric power, wind, geothermal, represent a significant economic development opportunity that could further the Tribe's sovereignty, self-governance, and the welfare of our Tribal members and the region's diversification of energy production.

The Tribe is already an energy producer and has embarked on a course to become a significant supplier of renewable energy in the Pacific Northwest. We currently own a one-third interest in the 440 megawatt Pelton-Round Butte Hydroelectric Project and own a 19 megawatt Reregulating Dam Hydroelectric Project and a 7 megawatt biomass generation facility at the Tribe's mill site.

Under agreement with Portland General Electric, the Tribe will eventually acquire a controlling interest in the Pelton-Round Butte Project, and as co-licensees we are spending millions of dollars on project operations to "green" the hydro operations, including investments to improve fish passage, water quality, riparian and fish habitat and cultural resources.

The hydro projects generate significant revenue for the Tribe on the order of around \$11 million per year.

We are actively pursuing an expansion of our biomass generation facility at the Warm Springs mill to 17 megawatts and are assessing our significant wind and geothermal energy resources on the Reservation for our commercial development.

Last, but not least, we are involved in a cooperative discussion with Bonneville Power Administration and other rights-of-way holders across the Reservation, on ways to enhance reliable and adequate electric transmission for the region while still respecting the Tribe's important sovereign interests in our Reservation and culture.

The Warm Springs Reservation is a beautiful but remote place, and that hinders more traditional economic development opportunities. The Reservation, however, has significant renewable energy production potential.

To realize the full potential of the wind, geothermal and biomass opportunities on the Reservation requires meeting significant challenges. For example, our biomass proposal has to overcome the

widely recognized hurdle of securing a stable source of material to fuel the facility.

We did this, in part, by executing the historic MOU with the U.S. Forest Service and BLM related to the management of surrounding federal lands.

The biomass facility will help to provide a market-based solution for the serious forest health and fire issues in Oregon and the Northwest. The biomass project is very competitive from a market perspective. We are in substantive negotiations for a power sale agreement and have entertained significant interest from potential equity investors and financing entities. (Beeping in audience).

That means five minutes, or what?

Senator SMITH. No. It doesn't mean anything to me.

Mr. SUPPAH. Okay. Like many renewable projects, modest Federal and state incentives are important in the overall cost structure of the biomass project.

For us, a critical issue today is the sunset on January 1, 2008, of the renewable electric production tax credit in Section 202 of the Energy Policy Act of 2005. Including yourself and Senator Wyden to pass—excuse me.

On that point, Warm Springs has urged Members of the Senate Finance Committee, including yourself and Senator Wyden, to pass an extension of at least two years for the PTC and energy legislation this year.

The extension is critical because the PTC is an essential element in attracting the needed equity investment.

Right now longer than expected negotiations appear likely to push our project beyond the current January 1, 2008 in-service deadline. Consequently, we need and Oregon's forest needs, an extension of the PTC of at least two years.

Constraint in energy transmission is another common limiting factor in bringing renewable energy projects to market. The Tribes sees itself as a partner in developing a regional solution for ensuring adequate and reliable regional transmission. The Warm Springs Reservation is currently criss-crossed by numerous energy rights-of-way, as noted earlier.

The Tribe and BPA view each other as partners in ensuring reliability of critical transmission capacity and reliability. As partners we can address the particular size needs of the Tribe, EPA, utilities and the public.

It is critical, however, that the Tribe's sovereignty be respected in any regional solutions to transmission capacity and reliability.

We have submitted comments related to the 2005 Energy Policy Act, Section 1813, tribal rights-of-way study, which are attached to my testimony as an exhibit.

The Draft 1813 rights-of-way study has just been released, recommending that condemnation is one option to permit rights-of-way across tribal lands. The Tribes absolutely objects to any option that would permit condemnation of reservation lands. It is simply not necessary.

Tribes are part of the states and regions in which they live. It is to all of our benefit to ensure that we have reliable and adequate transmission capacity.

Last, another issue of specific significance to the economic tribal renewable projects is the expectation that some power purchasers and investors have related to performance guarantees.

Given the structure of the Tribes and the Federal protections in place related to tribal assets, reaching an agreement on how the Tribes can provide generation performance guarantees can be problematic. Purchasing such guarantees might be an option. But that would increase the overall cost of tribal facilities and put them at a disadvantage compared to other energy generation facilities.

A Federal solution to this issue may be necessary. I ask that this committee examine such possibilities. For example, such a solution can be a credit enhancement similar to the Tribal Federal Loan Guarantees authorized by Section 502 of the 2005 Energy Policy Act.

In conclusion, I cannot overemphasize the importance that renewable energy plays in the Tribe's economic future and well being. Renewable and green energy generation fits well with our traditions, culture and beliefs.

We believe renewable energy generation will become ever more attractive in the energy market, but it is still a fact of life that modest Federal and state incentives are currently necessary to bring renewable projects to market.

I ask this committee to keep that in mind and continue to support these important incentives.

Equally important, however, is trying to find ways to create partnerships with other parties to capitalize on market solutions where they may exist to maximize the commercial appeal of renewables.

As an energy producing Tribe, I pledge to continue to do that. That concludes my testimony. Thank you.

[The prepared statement of Mr. Suppah follows.]

PREPARED STATEMENT OF RONALD SUPPAH, TRIBAL COUNCIL CHAIR, THE CONFEDERATED TRIBES OF THE WARMS SPRINGS RESERVATION OF OREGON; ACCOMPANIED BY WASCO CHIEF NELSON WOOLETON, JIM MANNION, RALPH MINNICK AND CAL MUKOMOTO

I. Introduction

The Confederated Tribes of the Warm Springs Reservation of Oregon ("Tribe") is a federally recognized tribe comprised of three tribes—the Warm Springs, Wasco and Paiute Tribes occupying the Warm Springs Indian Reservation ("Reservation") in north Central Oregon. The Tribe is one of several northwest Indian tribes that is currently involved in renewable energy projects and/or is planning such projects.

For example, there are three operating tribal utilities in the Pacific Northwest. With the likely changes to the Bonneville Power Administration ("BPA") rate structure to tiered rates, these utilities will be required to either meet their own load growth or pay BPA's higher rate. At least one tribal utility is actively considering a renewable resource for this purpose. There are likely 5–6 other area tribes interested in forming utilities that will be faced with the same issue. Among non-utility tribes there are a number of existing renewable projects on tribal land, including small wind at Blackfeet, biomass and hydro power at Colville and hydro power at Spokane. A number of tribes are considering wind, wave generation, biomass and solar, and all tribes are interested in energy efficiency, which is one of the best forms of a renewable resource.

As described more fully below, given our significant resources and expertise, the Tribe is poised to expand significantly our current involvement in energy generation and transmission. This involves adding generation capacity, facilitating well-planned transmission, and participating in policy discussions relating to renewable energy. In fact, the General Manager of our Warm Springs Power and Water Enterprises, Jim Manion, is participating on Governor Kulongoski's Renewable Energy Work Group which is defining the standard that should be considered for the state

to implement a renewable energy portfolio policy. In short, our experience and expertise in energy matters, including renewable energy, is well recognized.

For the Tribe, renewable energy projects—in particular, woody biomass, “green” hydroelectric power, wind, and geothermal—represent a significant economic development opportunity that could further the Tribe’s self-governance, the welfare of our tribal members and the region’s diversification of energy production. In addition, the Tribe’s generation capacity can play an important role in assisting utilities and states in achieving a balanced renewable energy portfolio and in meeting renewable energy portfolio targets. Unquestionably, renewable energy will continue to play an ever more valuable role in the region’s overall energy generation; however, there are still significant development constraints for renewable energy development in general and also as specifically related to tribes.

The purpose of this testimony is to highlight the central importance that renewable and other energy development plays in the economic and social welfare of the Tribe and to identify select ways that critical development constraints could be met to facilitate renewable energy generation on reservations and elsewhere.

II. Tribal Sovereignty and the Warm Springs Reservation

Participation in renewable and other energy projects is a central way to further and strengthen our sovereignty and to provide for the welfare of our tribal members. Tribal sovereignty must be understood in the context of the history of Indian reservations and in the context of our cultural beliefs. Respecting and strengthening our tribal sovereignty, in turn, is a vital component to ensuring the welfare of our tribal members.

The Warm Springs and Wasco Tribes entered into a treaty with the United States on June 25, 1855. In that treaty, the tribes ceded title to approximately 10 million acres of land in north Central Oregon and reserved for their exclusive use the Warm Springs Reservation, which is approximately 640,000 acres of land. The Warm Springs Reservation is beautiful, but remote. It lacks the infrastructure and proximity to population centers that may provide more traditional commercial and industrial economic development opportunities. Furthermore, the Reservation as a whole is much less productive than our traditional lands for our time-honored ways of sustaining our families and communities through hunting, fishing and gathering.

Through the years, our tribal government has been required to seek new ways to provide for our people. However, it is a critical element of our culture that we do so in a way that is in balance with the land and that never uses more of our precious natural resources than can be sustained forever. Indeed, although Federal law recognizes us as a sovereign people, we ultimately view our sovereignty not only as a construct of U.S. laws but fundamentally as given to us in the form of laws given by the Creator and by the land itself. Accordingly, we seek to develop economic opportunities in a way that honors and respects our traditional beliefs and provides opportunities for future generations to carry out the cultural traditions of our community.

The Warm Springs Reservation—comprised of approximately 640,000 acres, about $\frac{2}{3}$ forest lands and $\frac{1}{3}$ range land—has been the Tribe’s greatest economic asset. Historically, timber resources have been the mainstay of tribal revenue; however, the Tribe has more recently asserted our own brand of stewardship over these resources and has changed the course from over harvesting to sustainable yield management. In the context of the global timber market, timber revenues no longer can play the same role in providing for the welfare of our members.

It is well known that the Warm Springs Reservation community, like many other tribal communities, is a community in distress. Among other issues, our community has high poverty and unemployment rates, and high mortality and high education drop out rates for our young. Participation in the energy sector is a critical way for the Tribe to reverse these social and economic trends, provide for our members and to further our sovereignty.

In short, the renewable and other energy resources available on the Reservation provide a unique opportunity to advance our sovereignty, self-sufficiency, the vitality of our traditional culture, and the well-being of our members.

III. Renewable Energy Potential and Existing Energy Projects on the Warm Springs Reservation

The Warm Springs Tribe is already an energy producer and has embarked on a course to become a significant supplier of renewable energy in the Pacific Northwest. It currently owns a one-third interest in the 440 MW Pelton-Round Butte Hydroelectric Project with Portland General Electric (“PGE”). The Tribe also owns the 19 MW Reregulating Dam Hydroelectric Project and a 7 MW biomass project that operates using wood waste from the Tribe’s lumber mill. Future energy projects on

the Reservation include development of a new 17 MW biomass facility at the Tribe's lumber mill utilizing materials removed from tribal and adjoining national forests in connection with forest health and wildfire reduction projects. The Tribe is also completing a comprehensive wind energy assessment for Tribal lands under a grant from the U.S. Department of Energy. Finally, the Tribe continues to inventory and study significant geothermal resources on the Reservation for future development.

A. *Tribal Participation in Existing Energy Generation—The “Greening” of Hydro.* The 440 MW Pelton-Round Butte Hydroelectric Project (“Project”) includes approximately 2,161.9 acres of Tribal land within the Reservation. The Tribe has regulatory authority within the Reservation and under an April 12, 2000 Long-Term Global Settlement and Compensation Agreement by and among the Tribe, the United States Department of the Interior acting by and through the Secretary of the Interior (the “DOI”) and PGE, the Tribe acquired a one-third ownership interest in the Project. Under agreement with PGE the Tribe will eventually acquire a controlling interest in the Project. The Tribe is a co-licensee of the Project license. The Tribe also owns a 19 MW Reregulating Dam Hydroelectric Project.

There is no dispute that hydroelectric power generation has historically had significant environmental downsides; however, we include this project as part of this “renewable energy testimony” because, as with our experience in timber management, the Tribe is endeavoring to change the historical course of dam operations on the Reservation to produce more up-sides.

Over several years of negotiations with PGE and various stakeholders, the Tribe and these parties in 2004 reached a historic Settlement Agreement Concerning the Relicensing of the Pelton Round-Butte Hydroelectric Project, No. 2030 (the “Settlement Agreement”). Important provisions related to fish and wildlife and riparian habitat of this Settlement Agreement have been incorporated in the current license for the Project (issued June 21, 2005). The Settlement Agreement and new license require the project licensees to invest millions of dollars in Project improvements related to, among others, improving fish passage, improving water quality, riparian and fish habitat and protecting cultural resources.

The economic potential of the Project and Regulating Dam project are significant to the Tribe. Currently, these projects generate approximately \$11 million per year to the Tribe. This could grow as the Tribe opts to assert more control over Project operations in future years.

B. *17 MW Biomass Energy Generation Proposal.* The Tribe already operates a 7 MW biomass generation facility co-located at the Warm Springs Mill site. With the assistance of a DOI grant and a USDA Woody Biomass Utilization Grant the Tribe has conducted a feasibility study to expand the generation capacity of the facility to 17 megawatts. Generated electricity from such an expanded facility would be sold on the open market and waste steam from the plant would be utilized to dry lumber at the kilns.

Expansion of the Tribe's biomass facility (the “Expanded Facility”) is expected to generate revenue for the Tribe, but its value goes well beyond the expected revenue generation. The Expanded Facility would provide us with the opportunity to replace 1930's era boilers to maximize efficiency at the mill, reduce water usage, and lower air emissions. In addition, the Expanded Facility would provide the potential to address hazardous forest fire threats on the Reservation and on adjacent Federal lands, to co-manage off-reservation treaty resources on Federal lands, and to add jobs for tribal members at the mill and in the woods. Indeed, the Tribe recently executed a historic Memorandum of Understanding with the U.S. Forest Service and Bureau of Land Management (the “MOU”) on adjacent Federal lands to facilitate forest fuel reduction and forest and rangeland resource management projects of interest to the Tribe. The MOU recognizes the agencies' special Trust relationship to the Tribe and the Tribe's Treaty reserved rights to hunt, fish and gather food at usual and accustomed stations on federal lands. It is expected that one of the first Tribal Forest Protection Act projects will be coordinated under this MOU.

The Expanded Facility will facilitate these benefits because it provides a ready market for the woody biomass generated from forest thinning and other forest or rangeland projects. In other words, the Expanded Facility provides a long-term market-based solution for the serious forest health issues in Oregon and the Northwest caused by decades of fire suppression that have led to the fuels buildup resulting in many recent catastrophic wildfires.

A recognized challenge for the establishment of biomass facilities around the United States is the ability of project proponents to secure a stable and economical supply of woody biomass. Indeed, the Government Accountability Office (GAO) was asked to explore obstacles that are impeding the use of woody biomass for energy. The GAO has found that challenges associated with woody biomass usage included insufficient supply and that supply from Federal lands was particularly uneven. See

GAO, *Natural Resources, Report to the Chairman, Committee on Resources, House of Representatives; Woody Biomass Users' Experiences Offer Insights for Government Efforts Aimed at Promoting Its Use*, March 2006 (GAO-06-694T); GAO, *Natural Resources, Federal Agencies Are Engaged in Numerous Wood Biomass Utilization Activities, but Significant Obstacles May Impede Their Efforts*, May 2005 (GAO-05-741T).

Under the tribal and Federal agency MOU, with the cooperation of BIA forest managers, and with the ready availability of urban wood, the Tribe's biomass facility has been able to demonstrate to potential power purchasers, equity investors and financing entities that such a stable supply is available for our efforts to construct the Expanded Facility.

The Expanded Facility is very competitive from a market perspective. The likelihood of obtaining a favorable power purchase agreement is high. Potential power purchasers have shown concentrated interest, and we are in substantive negotiations for a power sale agreement. Similarly, we have entertained significant interest from potential equity investors and financing entities.

Like many renewable projects, however, modest Federal and state incentives are important in the overall cost structure of the biomass project. Indeed, the GAO biomass study found that one of the most important factors facilitating biomass use was the availability of financial incentives or benefits and that government grants were deciding variables. (GAO-06-694T) At issue today is the sunset on January 1, 2008, of the Renewable Electricity Production Tax Credit ("PTC") in Section 202 of the Energy Policy Act of 2005 ("2005 EPAct"). I have urged Members of the Senate Finance Committee, including Senators Wyden and Smith, to support inclusion of an extension of at least two years, and preferably five years, for the PTC in energy legislation to be enacted by Congress and signed into law this year.

The extension is critical for the following reasons. Currently, the PTC can provide over a million dollars per year for the first ten years of the project. That is significant for a roughly \$40 million project. The PTC is an essential element in attracting the equity investment required by the Warm Springs to move forward with the projects for an Expanded Facility. Unfortunately, the time it is taking to finalize a power purchase agreement for the electric output of the project—which is another essential element for the project's financing—now appears likely to delay our equipment acquisition and installation and place our "in service date" beyond the current January 1, 2008 deadline. Consequently, we need, and Oregon's forests need, an extension of the PTC of at least two to five years. In short, the extension of the PTC as provided in the 2005 EPAct is not sufficient time for a power developer to get all the "pieces" together without taking significant implementation risk.

In addition, the PTC places a distinction between different forms of renewable generation. In particular, the PTC permits 1.5 cents per kilowatt hour tax credit for wind, solar, closed-loop biomass and geothermal generation and .75 cents per kilowatt hour tax credit for open-loop biomass generation. The Tribe believes that this distinction is misplaced, especially if one understands the numerous social, environmental and economic benefits that a biomass facility can generate. Furthermore, open-loop biomass provides a steady and secure stream of electrical generation and has a valuable place in any energy portfolio that seeks to balance less steady energy generation such as wind generation. The Tribe would urge parity between open-loop biomass and other renewable energy generation in the PTC.

C. *Wind Energy Potential.* With a Department of Energy ("DOE") grant, the Tribe is assessing what potential we may have for commercial wind development. Preliminary results indicate that there may be sufficient resource present to advance to the next phase. We encourage the continued support from the DOE to explore the resources and assist the Tribe in developing this energy resource. As noted in the biomass discussion above, extension of the PTC will be critical to any wind development taking place on the Reservation. In addition, authorization of a new category of private activity tribal tax exempt bonds for renewable energy projects would assist the Tribe in contributing to the construction of wind towers.

D. *Geothermal.* The Tribe is also assessing whether adequate geothermal resources exist to justify commercial-scale generation. In the 1990s, the Tribe had conducted some assessment of the resource, concluding that the market potential was not yet ripe for development. With the assistance of a DOE grant awarded in 2005, the Tribe is reviewing the material that was compiled in the 1990s. With a world-renowned consulting firm, we are reassessing this resources and the market potential. We are preparing an updated report on this potential due to be completed in the fall of 2007. We are encouraged by the geothermal resource potential on the Reservation and the market potential for commercial development; however, for the reasons noted above, the PTC would be a critical incentive for such development. Tribal tax-exempt bonds could also be a critical factor facilitating commercial development

of geothermal generation on the Reservation, but the Internal Review Service on August 9, 2006, released a notice stating that it expects to issue Regulations prohibiting use of tribal tax-exempt bonds to finance any commercial or industrial enterprise—even if states and local governments engage in such activities themselves. In addition, given that tribes lack the economic resources to undertake such projects unless they partner with for-profit entities, a new category of private activity tax-exempt “exempt facility bonds” should be created by Congress to facilitate such projects. For example, such bonds could be used to drill test exploration wells, which could easily cost \$1 million per well.

E. *Energy Transmission*. Although energy transmission is not, itself, a “renewable” energy project or resource, no discussion of renewable projects is complete without considering the transmission picture. Only if renewable projects, often located in remote areas, can secure adequate and economical transmission of the generated electricity to market can they be viable. This is a common challenge for many renewable projects in the Northwest region and in the United States. The April 2006 Bonneville Power Administration White Paper titled, “Challenge for the Northwest, Protecting and Managing an Increasingly Congested Transmission System” states that “problems presented by congestion have been growing steadily and have become increasingly urgent as dispatchers find themselves operating more and more in an ‘emergency’ mode.” Non-utility power sellers that do not have preexisting transmission arrangements to meet load, such as tribes wishing to sell renewable power must either pay large fees to “get into the transmission queue” to acquire firm transmission (which generally does not exist), rely on non-firm transmission (which is often scarce) or provide the capital for necessary new facilities in advance.

The Tribe sees itself as a partner in developing a regional solution for ensuring that renewable energy and other energy has adequate transmission. The Warm Springs Reservation is currently criss-crossed by numerous energy rights-of-way. BPA, PacifiCorp, PGE, Wasco Electric Cooperative and the Tribe, itself, all maintain transmission/and or distribution rights-of-way. The Tribe and these entities view each other as partners in ensuring the viability of critical transmission capacity and reliability. As partners, we can address the particularized needs of the Tribe, BPA, the utilities, and the public. Indeed, the Tribe is in active negotiations with BPA to determine how we can meet each others needs.

It is critical, however, that the Tribe’s sovereignty be respected in any regional solution to transmission capacity and reliability. We have submitted comments related to the 2005 EAct Section 1813 Tribal land Right of Way Study. In those comments, attached hereto as an exhibit (Exhibit “A”), we detail our objections to any authorization that would undermine tribal consent to rights-of-way across tribal lands. Importantly, the draft 1813 Tribal land Right-of-Way study has just been released recommending that condemnation is one option to permit rights-of-way across tribal lands. *The Tribe absolutely objects to any option that would permit condemnation of Reservation lands.*

Putting aside all of the important reasons detailed in our comment letter as to why Congress should respect tribal sovereignty issues, no need exists to undermine and damage our sovereignty. Tribal entities, including the Tribe, have a long track record of working with energy partners to ensure adequate transmission, and we continue to work with BPA and others to ensure a long-term capacity and reliability for transmission. Tribes are part of the states and regions in which they live. It is to all of our benefit to ensure that we all have reliable and adequate transmission capacity.

IV. Partnerships and Federal Incentives Are Critical

Fully or even partially realizing the potential for the Tribe to utilize energy as a way to fulfill its obligations to its tribal members, requires focused and critical federal assistance/incentives and the continued recognition of Tribal sovereignty. It is well understood that the price of energy still does not reflect the true cost of production of fossil fuel generation. As a result, many renewable energy sources have a higher than market cost. Furthermore, the reality on the Warm Springs Reservation is the lack of infrastructure. Although there are significant transmission facilities that can be utilized, expanded transmission and other infrastructure needs may increase the cost of such generation.

Equally as important is trying to find ways to create partnerships with other energy entities and to capitalize on market solutions where they may exist to maximize the commercial appeal of renewables. As noted above, the biomass proposal provides an excellent example of trying to create a market solution to address the condition of our forests and rangelands and further our treaty rights and the condition of these resources. Similarly, the Tribe has entertained equity investment in the biomass facility to take advantage of existing state and Federal incentives avail-

able for such projects. The fact of the matter, however, is that Federal and state incentives still play a key role in renewable energy development in Indian country and in the region. Below is a brief discussion of selected federal incentives that have been and can continue to be helpful to the Tribe in our energy generation opportunities.

A. *Production Tax Credit.* The PTC provides an attractive incentive for potential equity investors for the Tribe's potential biomass, wind and geothermal projects. These projects all, and in particular the biomass project, have the potential to be very competitive on the energy market. The PTC can help to meet the small gap between project costs and market rates. In summary, the PTC is a good value for the Federal Government given the significant up-sides that the PTC will create by facilitating more renewable energy generation. Although the Tribe began planning the biomass plant well before the 2005 EPAct PTC extension, the current sunset of the PTC on January 1, 2008, simply does not allow a project developer to put together all of the requisite pieces. We urge this Committee to support passage of an extension of the PTC for at least two additional years and preferably five years in energy legislation this year.

B. *Tax exempt bonds.* Providing authorization for and adequate funding for tribal tax exempt bonds could also greatly facilitate renewable energy generation on the Reservation. The Internal revenue Service has been increasingly hostile to the use of tax-exempt bonds by Indian tribes. In response to recommendations by many, including the Tribal Government Tax-Exempt Bond Parity Act of 2006 recently proposed by Senator Smith, that Congress intended Indian tribes to be able to issue tax-exempt bonds for any purpose for which non-tribal governments issue them, the IRS released a notice last week proposing to issue Regulations that would prohibit tribes from issuing tax-exempt bonds for the purpose of generating revenue—even if non-tribal governments customarily issue bonds for such purpose. In addition, given that most tribes lack the economic resources to pursue such projects without the involvement of private enterprise, the only practical way to access tax-exempt financing for these projects would be for Congress to create a new category to “exempt facility bonds” that would permit the issuance of tax-exempt bonds by tribes for tribally owned renewable energy projects in Indian country.

C. *Credit Enhancements.* A difficult issue as it relates more particularly to *tribal* energy projects, including renewable and non-renewable generation and other energy projects are the expectations of some power purchasers and investors related to performance guarantees. Given the structure of tribes and the Federal protections in place related to tribal assets, reaching a mutually acceptable manner in which the Tribe can provide performance guarantees can be problematic. Although purchasing such guarantees if available may be one way, such credit would increase the overall cost of tribal facilities and put them at a disadvantage vis-à-vis non-tribal renewable and other energy generation facilities. A Federal solution to this issue may be necessary. For example, such a solution could be expanding or creating a new program similar to the guarantee program authorized by section 502 of the 2005 EPAct. Under this program, the Department of Energy is authorized to guarantee up to 90 percent of the unpaid principal and interest due on any loan made to an Indian tribe for energy development purposes (generally, activities that promote the generation of electric energy or production of fossil fuels on Indian lands).

D. *Office of Indian Energy.* The Tribe applauds Congress for creating the Office of Indian Energy in section 503 the 2005 EPAct. Such an office can greatly enhance tribal opportunities to develop the technical expertise and conduct the necessary due diligence and technical studies to assess resources and market potential. The Tribe is a grateful beneficiary of Federal agency grant programs to assess the feasibility of the biomass, wind and geothermal projects and urges Congress to continue to support such grant programs. The Office can be used to coordinate technical assistance programs and grants between the Department of the Interior broadly, the Bureau of Indian Affairs, and the Department of Energy, among other federal departments and agencies; thereby obtaining maximum value from such programs. The Office also can help to coordinate other important federal incentives related to federal portfolio standards and preference power. The Office of Indian Energy, however, can only be effective if it is adequately funded.

E. *Portfolio Standards and Preference Power.* The Tribe also applauds Congress for including in the 2005 EPAct Federal agency renewable portfolio standards, Indian energy double credit provisions, and Federal power purchase preferences for Indian energy. In particular, Section 203(a) of the EPAct requires that the Federal Government use not less than 3 percent in renewable energy in Fiscal Years 2007 to 2009, not less than 5 percent in renewable energy in Fiscal Years 2010 to 2012, and not less than 7.5 percent in renewable energy in Fiscal Year 2013 and years after. Section 203(c) provides for double credit if the energy used is produced on In-

dian land. Section 503 permits Federal agencies to give a purchase preference to Indian power. These incentives all help to create and bolster the market demand for renewable energy in general and Indian renewables in particular. To date, however, it has been difficult to realize the full benefits of these incentives. The Tribe believes that the Office of Indian Energy can provide significant assistance in coordinating these incentives.

V. Conclusion

The Tribe appreciates the opportunity to submit these comments. We are encouraged by the growing market for renewable resources and the growing viability for such markets. Renewable energy generation, including “green” hydroelectric and energy transmission solutions, will play a vital role in the Tribe’s economic future and well-being. It also will play a critical role in honoring and sustaining our culture and sovereign rights. It is still a fact of life, however, that modest federal and state incentives, such as the Production Tax Credit, are necessary to bring renewable projects, such as our biomass project, to market. I ask this Committee to keep that in mind and to continue to support these important incentives, including extending the PTC. Equally important, however, is trying to find ways to create partnerships with other energy entities to capitalize on market solutions where they may exist to maximize the commercial appeal of renewables. As an energy-producing Tribe, we pledge to continue to do that.

EXHIBIT A

THE CONFEDERATED TRIBES OF THE WARM SPRINGS RESERVATION OF OREGON

Comments on the Energy Policy Act of 2005, Section 1813 Right of Way Study, May 15, 2006

The Confederated Tribes of the Warm Springs Reservation of Oregon (“Tribe”) is a federally recognized tribe comprised of three tribes—the Warm Springs, Wasco and Paiute Tribes occupying the Warm Springs Indian Reservation (“Reservation”) in north Central Oregon. There are approximately 3,800 tribal members, approximately 90 percent of whom reside on or near the Reservation. The Reservation is comprised of 640,000 acres, about $\frac{2}{3}$ forest lands and $\frac{1}{3}$ range land.

Background

The Warm Springs and Wasco Tribes entered into a treaty with the United States on June 25, 1855. In that treaty, the tribes ceded title to approximately 10 million acres of land in north Central Oregon and reserved for their exclusive use the Warm Springs Indian Reservation. They additionally reserved important hunting, fishing and gathering rights on unclaimed lands outside the reservation. Tribal members continue to exercise these rights on the millions of acres of BLM and Forest Service lands surrounding the Reservation. Through a comprehensive memorandum of understanding, the Tribe acts as a co-manager on these federal lands to protect and preserve these important off-reservation rights.

Two provisions of the treaty are directly relevant to the Section 1813 Right of Way Study. After describing the boundaries of the reservation, the treaty provides “all of which tract shall be set a part, and, so far as necessary, surveyed and marked out for their exclusive use . . . ; nor shall any white person be permitted to reside upon the same without the concurrent permission of the agent and superintendent.” Article 9 of the treaty also provides “the said Confederated Bands agree that whenever, in the opinion of the President of the United States, the public interest may require it, that all roads, highways and railroads shall have the right-of-way through the reservation herein designated, or which may at anytime hereafter be set apart as a reservation for said Indians.” No provision is made for rights-of-way other than railroads and roads in the treaty.

With passage of the Indian Reorganization Act in 1934 (the “IRA”), the three tribes occupying the reservation availed themselves of the provisions of Sections 16 and 17 of the IRA. Under Section 16, the Tribe adopted a constitution and bylaws establishing a form of tribal government under which all governmental authority was exercised by a tribal council. The Tribal Council consists of 11 members, 8 of which are elected every 3 years, and 3 of which are chiefs selected by their respective tribes to serve on the Tribal Council for life. The United States also issued to the Tribes a Federal corporate charter pursuant to the provisions of Section 17 of the IRA, under which the Tribe carries out much of its proprietary business activity. Copies of the Constitution and Bylaws, and Federal Corporate Charter are attached.

The Reservation itself is bounded on the west by the summit of the Cascade Mountain Range, on the south by the Metolius River, on the east by the Deschutes River, and on the north by the Tygh highlands. Over 400,000 acres is forested. Tim-

ber from these lands supplies the Tribe's lumber mill. The majority of the remainder of the land is rangeland. Minimal agricultural activity occurs on the reservation because of short growing seasons for relatively poor soil.

The Reservation, like many others, was allotted to individual Indians late in the 19th Century. This allotment caused the fractionated ownership problem that is prevalent on so many reservations. The Tribe undertook to cure that problem beginning in the 1960s. In 1961, Congress passed the Warm Springs Land Consolidation Act, which authorized the Tribe to purchase lands within its own reservation. Prior to that, the Tribe had been prohibited from such purchases.

The Tribe then began setting aside money each year to purchase lands from willing allottee sellers and fee holders. After 45 years of purchases, the Tribe now owns approximately 93 percent of the land within the reservation. Approximately 7 percent is still held by allottees and less than one-third of one percent is held in fee. Of the few hundred acres of fee land remaining within the Reservation, most of it is held by individual Indians. No non-Indians live on fee lands within the Reservation. Consolidation and control of the Tribe's own lands has, thus, been a hallmark of tribal policy for decades. When the Tribe began its consolidation effort, the only major non-Indian business on the reservation was the lumber mill owned by Jefferson Plywood. In 1967, the Tribe purchased this mill.

Since the Reservation was established, the Tribe has struggled to maintain control of its land as a homeland for its people. The Warm Springs Reservation was recognized early on by the United States as one of the poorest reservations ever established. Yet, the Tribe has created and maintained a tribal homeland that serves as the glue to hold its people and culture together. They have overcome the challenges posed by reservation allotment, and periodic non-Indian attempts to gain control of reservation resources. The Tribe controls its land base and manages it wisely.

The tribal government derives its income from Reservation resources. It does not do it at the expense of cultural or religious values. For example, forest lands, valuable for timber production, are often managed for huckleberry production, a food of great religious and cultural significance to the Tribe. More than 30 years ago, the Tribe established in-stream flows for on-reservation streams necessary to protect the salmon fishery that defines its culture. Recently the Tribe's forests were certified as "green" by the Forest Stewardship Council, and the Tribe now markets environmentally sound lumber. The Tribe has established state-of-the-art integrated resource management plans for the forest and range lands that ensure sustainable use of those lands and protection of religious and cultural values.

The Tribal Council has adopted comprehensive laws governing the reservation which are enforced by their justice system through the tribal courts. Those laws govern all non-Indian activity on the reservation. The Tribe has been delegated enforcement authority under the Clean Water Act by the Environmental Protection Agency (the "EPA") and manages water resources on the reservation under that authority and the Tribe's inherent authority. The Tribe is in the process of acquiring regulatory authority over air quality on the reservation from the EPA.

The Tribe has established a number of business enterprises that provide income to the tribal government with which to provide essential governmental services. Those enterprises include Warm Springs Forest Products Industries, Warm Springs Composite Products, Warm Springs Construction Enterprise, Kah-Nee-Ta Vacation Resort and Gaming Enterprise, the Museum at Warm Springs, Warm Springs Water and Power Enterprises, Warm Springs Ventures, and Tectonics International. Although not wealthy, the Tribe has managed to create a secure homeland for its members with the limited resources available to it. They have been able to do this because of the control and integrity of the Reservation land base. It is that control and integrity that will allow the Tribe to meet the significant challenges that it faces in the future to provide employment and housing for its rapidly growing membership.

It is in this context that the right-of-way issue must be examined. Rights-of-way potentially impinge upon the ability of the Tribe to control and manage its land base far into the future. In addition, the Tribe must ensure that it derives fair compensation for the use of its resources in order to provide for the tribal membership. It was only when the Tribe was able to begin managing its own affairs that it began to achieve a degree of success and realize its aspirations for its people. Anything that infringes upon this right and ability will be vigorously opposed by the Tribe and is fundamentally inconsistent with the Tribe's exclusive use of its own reservation.

Consent Requirement

First is the issue of tribal consent as it applies to rights-of-way. Removal of tribal consent requirements is fundamentally inconsistent with the provisions of the trea-

ty. The entire bargain struck in the treaty was based on the Tribe's cession of title to most of its ancestral lands in return for a guaranteed exclusive use to a small fraction of its aboriginal territory. Past violations of the consent principle throughout Indian Country have resulted in grave hardship for Indian tribes and have compounded the challenges in providing for the future of Indian people. That problem should not now be further exacerbated by new misguided attempts to remove the consent requirement.

Second, removal of the consent requirement is inconsistent with the provisions of the Indian Self Determination Act. It is under this Act that tribes have been enabled to chart their own futures. Energy companies, motivated solely by their own profit, should not be allowed to unilaterally determine the future of Indian tribes in any respect.

Third, the issue of consent has not been a serious impediment to the granting of rights-of-way on the Warm Springs Reservation. The Reservation, with tribal consent, contains numerous roads, railroads, telecommunications, energy and other rights-of-way. Some of these serve the Reservation, while others merely pass over it. Historically, the Tribe received inadequate compensation for some and adequate compensation for others. As the Tribe's control of its own resources and financial sophistication has improved, so has the economic return for rights-of-way through the Reservation. What is clear is that any future rights-of-way decisions made by the Tribe must ensure that the Tribe receives adequate economic return for the use of its resources.

Fair Compensation

That brings us to the subject of fair compensation. The Warm Springs Reservation, like many Indian reservations, is criss-crossed by numerous energy rights-of-way. The Bonneville Power Administration, PacifiCorp, Portland General Electric Company, and Wasco Electric Company all maintain transmission rights-of-way. PacifiCorp and Wasco Electric also have distribution rights-of-way. Warm Springs Power and Water Enterprises, a tribal enterprise, maintains a transmission right-of-way in connection with its Reregulating Dam Hydroelectric Project. The Tribe has also been in active discussion for several years with TransCanada Pipelines, Ltd., regarding the location of a gas lateral pipeline across the Reservation.

The Warm Springs Tribe is, in addition, an energy producer and has embarked on a course to become a significant supplier of renewable energy in the Pacific Northwest. It currently owns a 1/3 interest in the 440 MW Pelton-Round Butte Hydroelectric Project with PGE. Under agreement with PGE it will eventually acquire a controlling interest in the Project. It also owns the 19 MW Reregulating Dam Hydroelectric Project and a 7 MW biomass project which operates using wood waste from the Tribe's lumber mill. The Tribe is developing a new 16 MW biomass facility at the mill that will utilize materials from tribal and adjoining national forests removed in connection with forest health and wildfire reduction projects. The Tribe is completing a comprehensive wind energy assessment for Tribal lands under a DOE grant. Finally, it continues to inventory and study significant geothermal resources on the Reservation for future development.

The Tribe's first experience with energy rights-of-way began in the 1950's with the licensing of the Pelton Hydroelectric Project by the Federal Power Commission. Until that time little development had taken place on the Reservation, and the Tribe was only beginning to sell its timber. The Federal Power Act and the FPC required Portland General Electric Company to enter into an agreement with the Tribe for the use of its lands. The 1955 agreement and subsequent 1960 amendment provided annual charges for the use of tribal lands in connection with the generation and transmission of power. The initial annual charges were approximately \$90,000 for the Pelton Dam and \$200,000 for the Round Butte Dam. The Federal Power Act and the tribal agreement provided for periodic readjustments of these charges. Since 1920, the FPC had used the "sharing of the net benefits" method to determine appropriate annual charges for projects located either on Indian lands or in government dams. The theory was that the net benefit of a project was the difference between energy costs at the licensed project compared with the next best alternative available to the developer. The net benefit was then "shared" between the landowner (either the Tribe or the government dam owner) and the developer. This was in recognition that both made essential contributions to the feasibility of the project. Typically the benefit was shared 50/50 between owner and developer.

By the mid-1970s the value of power had risen substantially in the United States and through a series of vigorously contested readjustment proceedings before FERC and arbitration panels the compensation to the Tribe for the use of their lands rose to about \$5 million per year. In 1986, the Tribe and PGE entered into a comprehensive settlement agreement covering the remainder of the license period ending in

2001. At the end of the license period the compensation was approximately \$11 million per year.

The provisions of the Federal Power Act are particularly instructive with regard to the Section 1813 study. They deal with each of the issues raised by the current controversy. Section 10(e) of the Federal Power Act (16 U.S.C. Section 803(e)) provides in relevant part:

(e) Annual charges payable by licensees; maximum rates; application; review and report to Congress

(1) That the licensee shall pay to the United States reasonable annual charges in an amount to be fixed by the Commission for the purpose of . . . for recompensing it for the use, occupancy, and enjoyment of its lands or other property . . . Provided, That *when licenses are issued involving the use of Government dams or other structures owned by the United States or tribal lands embraced within Indian reservations the Commission shall, subject to the approval of the Secretary of the Interior in the case of such dams or structures in reclamation projects and, in the case of such tribal lands, subject to the approval of the Indian tribe having jurisdiction of such lands as provided in section 476 of title 25, fix a reasonable annual charge for the use thereof, and such charges may with like approval be readjusted by the Commission at the end of twenty years after the project is available for service and at periods of not less than ten years thereafter upon notice and opportunity for hearing; Provided further, That licenses for the development, transmission, or distribution of power by states or municipalities shall be issued and enjoyed without charge to the extent such power is sold to the public without profit or is used by such state or municipality for state or municipal purposes, except that as to projects constructed or to be constructed by states or municipalities primarily designed to provide or improve navigation, licenses therefore shall be issued without charge; and that licenses for the development, transmission, or distribution of power for domestic, mining, or other beneficial use in projects of not more than two thousand horsepower installed capacity may be issued without charge, except on tribal lands within Indian reservations; but in no case shall a license be issued free of charge for the development and utilization of power created by any government dam and that the amount charged therefore in any license shall be such as determined by the Commission . . .*

Pursuant to these provisions licensees are required to obtain the consent for a project within the reservation. Periodic adjustment to the rents is made. And FERC considers the economic value of the project when adjusting charges.

In the 1970s the Tribe entered into negotiations with the Bonneville Power Administration to construct a new right-of-way across the Reservation. The Tribe rejected initial offers based on traditional appraisals of their lands. The Tribe thought it was unreasonable to commit to an intrusive right-of-way for very little compensation. Eventually the Tribe and BPA agreed to split the difference between the cost of a right-of-way across the Reservation and an alternate route around the Reservation. The Tribe received \$4 million, approximately 40 times the original offer.

Finally, in 2000, the Tribe entered into a settlement agreement with PGE regarding future ownership of the Pelton-Round Butte Project after the expiration of the original license. As a part of this agreement, it was necessary to amend 25 U.S.C. 415 to extend leasing authority on the Warm Springs Reservation from 25 years to 99 years in recognition of the fact that the long term agreement reached between the parties was not feasible with limited leasing authority. The agreement made the Tribe and PGE joint venturers in the project and aligned their interests in a way that minimizes the opportunity for future conflict.

The foregoing development on the Warm Springs Reservation would not have been possible if traditional appraisal methods had been used. There simply would have been inadequate incentive for the Tribe to commit its resources. It was made possible because valuation of tribal interests was based on the value of its lands for power production or transmission purposes. Many rights-of-way are routed across tribal lands that have minimal value as range or desert lands. Even if the full value of these lands was paid to the Tribe it would be a pittance compared to their enormous value as energy rights-of-way. As the saying goes, real estate values are based on three factors—location, location, and location. It is the strategic location of rights-of-way across Indian lands that give them real value. The Tribe should be entitled to realize this value.

Traditional appraisal techniques are totally inappropriate for valuation of tribal lands in connection with rights-of-way. Traditional methods include comparable sales, income analysis, cost analysis and cost of development. As applied in condemnation and acquisition proceedings with regard to energy rights-of-way they end

up valuing the land for purposes other than for developing or transmitting energy. For example, in the context of the Federal Power Act landowners whose lands are condemned for hydroelectric project are not entitled to compensation based on the power production potential of their lands. In the arid west these types of lands can typically sell for less than \$100 per acre when their value for power production or transmission purposes exceed that amount by orders of magnitude.

Traditional appraisals are inappropriate for tribal land valuations for a number of reasons. First, they do not include in the valuation a number of things that are of primary importance for the Tribe. They do not factor in tribal historic, cultural, religious, privacy, community or other interests of the Tribes. They are contrary to the “exclusive use” provisions contained in many Indian treaties. They do not recognize that the highest and best use of the property is for energy production or transmission. They do not consider what impacts these rights-of-way may have on the rest of the Reservation. They do not consider what impacts the rights-of-way may have on the sovereignty of the Tribe and its ability to govern activities within its boundaries. They do not value lost opportunity costs to Tribes.

Just as with traditional appraisal methods, appraisals based on energy production or transmission values may be carried out in a number of ways yielding a range of values. The method most appropriate in a particular case may vary based on the specific circumstances. Following is a description of a number of ways that such an appraisal could be approached.

1. Costs of alternative routes around the reservation. This embodies the principle of “substitution” in traditional appraisal methodology. The method directly measures the “location” value of tribal lands that is its location as the cheapest route available. It is highly unlikely that a developer would pay the full amount for less than a perpetual right-of-way since anything less than that would have to factor into the cost of the tribal right-of-way any future costs associated with renewals, etc. It simply becomes a matter of bargaining to arrive at some allocation that will be acceptable to both.

2. Valuation of energy system across reservation as compared to valuation of system as a whole. Individual states already parse out the value of an energy company among each state for income and property tax purposes as a means of constitutionally determining what they can tax. The reservation portion of the system receives a valuation as a percentage of the whole and then, at least for private companies, a portion of the income of the company can be attributed to the system on the reservation. An appropriate allocation between landowner and developer can then be negotiated. One advantage of this approach is that it can form the basis for adjusted charges in the future based on the changing profitability of the company, either up or down.

3. Wheeling charge. Under FERC Order 888 directing open transmission across FERC regulated electric lines a per kWh charge is levied. The same principle could be applied to energy rights-of-way, *i.e.*, the payment to the Tribe depends on the amount of energy transmitted across the reservation. Logically, the amount of energy transmitted and the length of the right-of-way are indicators of the value of the right-of-way.

4. Comparable sales. Increasingly there are market sales of rights-of-way that can be used to determine value. Bolton and Sick concluded that:

“The proper method for appraising properties within a corridor is to use market data occurring within a corridor. There is a vast amount of existing corridor space currently available, literally hundreds of thousands of miles. If buyers and sellers for a particular type of property exist in the market place, then market data will be available to the appraiser.” http://www.powerlinefacts.com/Power_Lines_and_Property_Values.htm.

The market data approach was used in a recent report to the National Oceanic and Atmospheric Administration entitled “Fair Market Value Analysis for a Fiber Optic Cable Permit in National Marine Sanctuaries.” In this case market value was deemed to be the best method of valuation because of the particular circumstances involved. It also recognizes that fair market value will change over time and so should the amount charged under the permit.

“The authors of this report recommend the analysis of comparable previous transactions as the appropriate approach to determining fair market value. Most appraisers have rejected land-based, across-the-fence methods as inadequate to address current market conditions in the fiber-optic communications market. While the scenario of the willing buyer and seller emphasizes build-around cost as an upper bound on market value for rights-of-way, the information required to evaluate build-around cost, particularly for submarine cables,

is prohibitive. Income-based analysis also requires substantial information that is not readily available in most cases. Furthermore, expectations about future income are already incorporated into previous market transactions.” <http://sanctuaries.noaa.gov/library/national/fmvfinalreport.pdf>.

Unless tribes can receive value for rights-of-way based on their use as energy transmission corridors there is little incentive for the Tribe to grants rights-of-way. If nothing else, the tribe will reason that it should wait until it has the necessary access to capital to develop the lands as an energy corridor and then realize the economic benefit for itself, rather than to bargain away use of its lands for a tiny fraction of that value. The valuation issue is the key to dealing with the consent issue as it relates to renewals of rights-of-way. Unless the tribe can be assured that it can derive a portion of the economic value of the right-of-way there is little incentive to consent to renewal. On the other hand recognition of the entitlement of the tribe to a portion of the economic value sets that stage for a productive negotiation between the tribe and energy company.

Over the last 10 years this subject has received considerable attention in the context of right-of-way corridors in other contexts. It is increasingly recognized that denial to landowners of any value associated with the actual use of the right-of-way is inappropriate. In fact, the issue has been considered in connection with rights-of-way across Federal lands. In the draft “Capitol Hill Corridor Valuation Declaration: An Appeal for a Paradigm Shift from Monopoly to Market Corridor Valuation Methods and Federal Rights of Way Rent Schedules” the signatories concluded:

“Conventional corridor valuation methods (*e.g.*, Across-The-Fence (ATF) Method, Reproduction Cost Method, Liquidation Value Method, Value for Non-Corridor Use), and legal case law approaches such as the Nominal Method, are both self-interested and polarizing approaches that do not solve the corridor fair market rent valuation or easement valuation problems at hand in a ‘new economy’ in a deregulated environment. Deregulation of the natural gas, telecommunications, and regional electric utilities requires consideration of alternative methods that reflect ‘buyer’s market’ value that assume the availability of an alternate route in contrast with ‘seller’s market’ value (ATF value, corridor premiums) that are predicated on no alternate route.” <http://www.appraisers.org/disciplines/BLM-14.htm>.

The signatories concluded that rural federal land rents would be much higher if enterprise-based, rather than land-based rents, were used:

Federal land management agencies are likely to realize significantly higher rents for secondary uses of their corridors and lands from enterprise-based rents than from land-value based rents especially in rural areas where the bulk of its properties are located. Based on widely-advertised going rents from major fiber optic companies it is rough estimated that average rural land values would have to exceed \$21,780 per acre to be equivalent to quoted “going rents” in the fiber optic industry . . . *In other words, land-based values would likely yield rents from around 2 percent of what enterprise-based values might generate in rural areas . . .* (Emphasis in original)

It is axiomatic that appraisals must be based on the highest and best use of the land. It would be a very rare case in which rural Indian lands suitable for energy corridors had a higher and best use than for energy transport or transmission purposes. Bolton and Sick examined the question of corridor valuation and concluded:

“CVM (Corridor Valuation Methodology) is the most accurate and reliable approach to evaluating a right-of-way corridor or the property rights within the corridor. This method conforms to the principle of highest and best use, the unquestioned bedrock for appraising real property. Market data reflecting highest and best use ought to *always* be used in analyzing the appraised property, regardless of the resulting value conclusion, as long as careful consideration is given to the differences as a basis for adjustment of the market data. The ATF method may have some applicability to appraising property not located in a corridor. ATF methods seem inherently inconsistent with accepted appraisal practice when evaluating an established corridor property because it employs data that plainly does not reflect the subject’s highest and best use.” <http://www.boltonandbaer.com/downloads/articleValuation.pdf>.

And yet, the ATM method is one of the most common methods that has been used to value Indian lands. Much of the root of current disputes between tribes and energy companies has its root in the fact that energy companies are thinking in terms

of valuations that do not consider the highest and best use of Indian lands to be for energy transmission or transport purposes.

Suggestions for Change

The Section 1813 study has unfortunately established a negative dynamic with regard to participation by Indian tribes in America's energy future. Tribes know the origins of the legislation and understandably see it as one more in a long line of efforts to part them from their lands. Little has been said about the energy issue at the Denver meetings to dissuade them from that idea. In fact, threats of removal of consent requirements at the meetings have reinforced the tribe's conclusions.

If Congress is serious about dealing with this issue and America's energy problems it will seek to make tribes partners in that effort, not adversaries. Many energy companies have recognized this and have developed significant and positive relationships with tribes. Warm Springs is just one example. Those efforts have been jeopardized by this study.

But there are things that Congress can and should do to make the problem better, not worse.

First, short lease terms are a problem. If the consent requirement is maintained many tribes would have no problem with longer lease terms. In fact, the Warm Springs Tribe sought and obtained amendment to 25 U.S.C. Section 415 to lengthen permissible lease terms for Warm Springs tribal lands to 99 years in recognition of the fact that short lease terms do not provide sufficient time to make many projects commercially viable.

Second, the decision of the U.S. Supreme Court decision in *Strate v. A-1 Contractors, Inc.*, 520 U.S. 438 (1997) has made tribes leery of right-of-way grants. Although express reservations in rights-of-way may solve some of the problems created by this case Congress should consider a legislative fix to the problem.

Third, the decision of the U.S. Supreme Court in *Cotton Petroleum Corp. v. New Mexico*, 490 U.S. 163 (1989) and earlier precedents have made economic development on Indian reservations even more difficult by allowing states to impose tax burdens on non-Indian developers for on-reservation activity and property even though the states provide virtually no services on the reservation. These rulings have made it very difficult for Tribes, the entities that actually provide governmental services to the developers, to levy their own tax which would create a dual burden on the project. For this reason, rights-of-way payments to Tribes must necessarily include money to provide governmental services—one more reason to value tribal rights-of-way different than other rights-of-way.

Fourth, federal agencies, particularly the Department of the Interior lack the necessary expertise and resources to adequately advise and protect the interests of tribes. Although the energy interests of tribes are enormous the Department has only a small fraction of its personnel with expertise in the energy field that it does in other trust resource areas such as forestry.

Fifth, there should be clear recognition that right-of-way payments to Indian tribes for energy rights-of-way should take into account the energy corridor value of the right-of-way.

Sixth, the ability of the tribes and the energy industry to enter into joint ventures that align their economic interests should be facilitated. This can be done with common mechanisms involving bonding authority, accelerated depreciation, tax credits, and guaranteed loans.

Senator SMITH. Thank you, Ron, for your testimony. I am confident we will extend the tax credit, and I don't think that there is much partisan disagreement about the importance of that.

I'm familiar with your timber operation on the Reservation of Warm Springs. And can you explain to the audience and have on the record how you believe your biomass proposal will be complementary to that.

Mr. SUPPAH. I would maybe like to ask Ralph Minnick or Cal Mukomoto to respond to that, to answer that.

Mr. MUKOMOTO. Senator, we believe that our proposal—

Mr. SUPPAH. Come up here.

Mr. MUKOMOTO. OK. Senator, we believe that our proposal is a market solution to the forest restoration and ecological restoration of our forest.

As you know, a hundred years of fire suppression has created overstocked and highly large amounts of hazardous fuels in our forest, and since we are going to be able to use biomass from the forest, we believe that this could create a marketplace for that fuel and help offset the cost of restoring our forests to a—our fire adapted forests to a natural state.

Senator SMITH. Very good. Thank you.

Ron, do you believe that these rights-of-way issues are resolvable? Obviously, nobody wants transmission going through their neighborhood. But everybody wants to produce energy to put on transmission lines that are under-capacitized right now.

Do you see that as an issue that can be resolved, and I'm not even proposing any route.

Mr. SUPPAH. Yes, I do think that there are solutions, and I think that in the meeting coming up in Denver on the 24th, I hope that the tribal caucus can put together the position paper and statement on behalf of the Tribes.

All the Tribes are different, though. And in Oregon's case, we're pretty lucky, because we have very amenable Tribes and they look for solutions versus being a problem. So, I think there are solutions out there.

But in my testimony, and in the attachments, I believe that we've stated what we feel we need.

Senator SMITH. Very good. Well, thank you very much.

We will turn now to Stan Watters.

STATEMENT OF STAN WATTERS, PRESIDENT, PACIFIC POWER

Mr. WATTERS. Good morning, Mr. Chairman. Thank you for the opportunity to speak before the Subcommittee today on renewable energy and its economic development benefits.

My name is Stan Watters and I am the President of Pacific Power, which is part of PacifiCorp, an electric utility that serves in six Western states.

We have approximately 1.6 million customers, including more than 525,000 in Oregon. PacifiCorp is a subsidiary of MidAmerican Energy Holdings Company, which is the largest utility developer of renewable energy projects in the country. More than 3,000 megawatts of MidAmerican's total capability, approximately 15 percent, currently comes from green energy sources.

Senator SMITH. How much is that?

Mr. WATTERS. Fifteen percent.

Senator SMITH. Fifteen percent currently.

Mr. WATTERS. Currently. PacifiCorp owns itself—owns or purchases or has under contract 1,704 megawatts of electricity from renewable sources.

Last month we were pleased to announce the purchase of the 100.5 megawatt Leaning Juniper wind farm in the Columbia Gorge, and this project should be online any day now.

Leaning Juniper is a significant step in our commitment to develop an additional 400 megawatts of cost-effective new renewable energy by the end of 2007, and 1,400 megawatts by 2015.

We also consider hydropower to be a valuable, emission-free energy source. In fact, we were the first utility to benefit from the

2005 Energy Policy Act provision that gives utilities incentives for increasing efficiency that exists in hydro-electric facilities.

We are lucky to have locations within our service area with good wind resources and adequate transmission. However, most of these locations have already been developed and future developments will likely be more costly.

It is both a benefit and a challenge that makes the areas with potential for high quality renewable energy development generally rural.

On one hand residents tend to be more receptive to these developments and the new sources of income they tend to bring to the rural community.

On one hand, resident property owners can receive annual rental payments of several thousand dollars per turbine, construction activity provides significant short-term benefits, and there are modest longer term employment opportunities.

The local tax base also benefits. By the end of this decade some Columbia Gorge counties will have as much as 20 percent of their property taxes coming from wind farms.

While rural economies may benefit, these locations tend to be far from electric load centers which requires substantial investment in electric transmission. It costs roughly \$1 million or more per mile to build new transmission lines.

We believe that renewable energy is an important economic part of a diverse and balanced generation portfolio.

Note that I said economic. While our investors make the funds available to construct renewable facilities, it is our customers who pay for what those facilities provide. And we owe it to our customers to make economic decisions.

We know you have been a leader in encouraging Congress to adopt long-term extensions for the renewable production tax credits. These market-based incentives are the most effective and efficient way to increase the use of renewable resources.

The most recent extension of the production tax credit led to an unprecedented boom in U.S. wind energy production. Unfortunately, this credit is due to expire at the end of next year, raising the possibility that renewable development will once again come to an abrupt halt.

To facilitate a more economically-viable consumer-friendly renewable energy development policy, policies should be developed with increased financial certainty associated with renewable energy development.

And this is the key point. We need a five-year extension of the production tax credit and a greater commitment by the regulators to ensure utilities can fully recover the cost of building projects and associated infrastructure.

We also need to recognize that while renewable energy plays a role in meeting our future growth requirements, economics and geography require us to continue to develop environmentally responsible electric generation projects from all available energy sources, including fossil fuels.

We should avoid the temptation to enact overly ambitious and arbitrary renewable portfolio standards that are not economically viable.

In order to protect consumers, any RPS should be developed as a long range goal supported by reasonable incentives and sound regulatory policy, not a series of arbitrary short-term mile posts enforced by punitive penalties.

Finally, we need to expand the Nation's transmission infrastructure by encouraging state cooperation in the approval of multi-state transmission corridors and by providing a clean means for recovering costs—a clear means for recovering costs.

Senator SMITH. And clean, yes?

Mr. WATTERS. Yes. And clean. Over the next several years watch for PacifiCorp to set the pace for expanding renewable energy development in the Northwest.

Thank you for your leadership in this area, and we look forward to working with you in the years to come.

[The prepared statement of Mr. Watters follows:]

PREPARED STATEMENT OF STAN WATTERS, PRESIDENT, PACIFIC POWER

Good morning, Mr. Chairman. Thank you for the opportunity to speak before the Subcommittee today on the topic of renewable energy and its economic development benefits.

My name is Stan Watters, and I am the President of Pacific Power, which is part of PacifiCorp, an electric utility serving six states in the Pacific Northwest and Rocky Mountain regions. We serve approximately 1.6 million customers, including more than 525,000 in Oregon. PacifiCorp is a subsidiary of MidAmerican Energy Holdings Company, the largest utility developer of renewable energy projects in the country.

MidAmerican Energy Company, the other electric utility subsidiary of MidAmerican Energy Holdings Company, has 695.5 megawatts of wind energy facilities either in operation, under construction or under contract in Iowa.

PacifiCorp owns, purchases or has under contract 1,704 megawatts of electricity from renewable sources—1,167 megawatts from hydroelectric; 457 megawatts from wind; 29 megawatts from geothermal; and the remainder, 51 megawatts, from solar, biomass and biogas.

MidAmerican subsidiaries also own and operate 10 geothermal energy plants in California and 2 in the Philippines, producing a combined capacity of nearly 700 megawatts of electricity from naturally occurring geothermal heat.

More than 3,000 megawatts of MidAmerican Energy Holdings Company's total energy capability, approximately 15 percent, currently comes from green energy sources. Last month, PacifiCorp was pleased to announce that it purchased the 100.5 megawatt Leaning Juniper wind farm in the Columbia River Gorge in Gilliam County, Oregon. This project is virtually completed and should be online in the next week or two. On the other side of our system in Utah, PacifiCorp has also begun an 11 megawatt expansion of the company's 26.1 megawatt Blundell geothermal energy plant. These transactions represent a significant step toward meeting PacifiCorp's commitment to develop an additional 400 megawatts of cost-effective new renewable energy by the end of 2007, and 1,400 megawatts by 2015.

Hydropower is also a valuable emissions-free energy source. PacifiCorp was the first utility to benefit from a provision in the Energy Policy Act of 2005 that provides utilities with incentives to make efficiency improvements or capacity additions to existing hydroelectric facilities. We qualified for those incentives as a result of work done that increased efficiency 2.6 percent at Unit 2 of our J.C. Boyle plant on the Klamath River in Southern Oregon.

At PacifiCorp and throughout MidAmerican, we believe that renewable energy is an important, economic part of a diverse and balanced generation portfolio. Note that I said "economic" part of our portfolio. We can never lose sight of the fact that while our investors make the funds available to construct the renewable facilities, it is our customers who pay for the services provided by those facilities. And, we owe it to our customers to make economic decisions about the generation and energy efficiency resources that comprise our generation portfolio.

In contrast to fossil-fueled generation where the utility chooses the location, renewable resources choose their own locations. PacifiCorp and MidAmerican Energy have been fortunate to have locations within their respective service areas that have good wind resources and adequate transmission. However, most of the economic lo-

cations have already been developed, and future developments will likely be more costly.

It is both a benefit and a challenge that locations with high-quality renewable energy development potential are generally located in rural areas. On one hand, residents of these areas tend to be more receptive to economic development and less inclined to invoke “not in my back yard” challenges to projects.

These projects do tend to bring new sources of income to rural areas. Property owners can receive rental payments of several thousand dollars per turbine per year. There are also significant short-term benefits from the construction activity, and modest longer-term employment opportunities. And, the local tax base benefits. For example, Gilliam County should see a significant bump in property tax as a result of our new Leaning Juniper project. I’ve heard projections that by the end of this decade, some Columbia Gorge counties will have as much as 20 percent of their property taxes coming from wind farms.

While the rural economies may benefit, it’s also true that these locations tend to be far from electric load centers, requiring substantial investment in electric transmission. A rule of thumb for the transmission investment required to bring new capacity to market is approximately \$1 million or more per mile of new transmission line needed. Through our Integrated Resource Planning process and ongoing regional dialogue—as well as planning upgrades to our system—we continue to work to address the integration issues that come with renewable development.

For us, the issue of the economic deployment of renewable resources must remain front and center locally and nationally. Congress can help support the economics of renewables.

We know you have been a leader in pushing Congress to adopt long-term extensions of wind energy and other renewable production tax credits. These market-based incentives are the most effective and efficient means of increasing the deployment of renewable resources. The most recent extension of the Section 45 production tax credit provided in the Energy Policy Act of 2005 has led to an unprecedented boom in wind energy production in virtually every region of the country. Unfortunately, with the tax credit due to expire at the end of next year, project developers, turbine manufacturers and a host of other suppliers of materials and construction labor face the possibility that the industry will once again come to an abrupt halt.

Going forward, renewable energy development needs to be placed in the larger context of coordinated energy, environmental and economic policies. To facilitate more economically viable, consumer-friendly renewable energy development, state and Federal governments should develop policies that:

- (1) Increase financial certainty associated with renewable energy development through a five-year extension of the production tax credit and a greater commitment by regulators to ensure utilities can fully recover the costs of building projects and associated infrastructure.
- (2) Recognize that while renewable energy plays a role in meeting our future growth requirements, economics and geography require us to continue to develop environmentally responsible electric generation projects from all available energy sources, including fossil fuels.
- (3) Avoid the temptation to enact overly ambitious and arbitrary renewable portfolio standards that are not economically viable. In order to protect consumers, any renewable portfolio standard that Congress or the state choose to enact should be developed as a long-range goal supported by reasonable incentives and sound regulatory policy, not a series of arbitrary, short-term mileposts enforced by punitive penalties that do not serve to get any new resources deployed.
- (4) Promote expansion of the Nation’s transmission infrastructure by encouraging state cooperation in the approval of multi-state transmission corridors and by providing a definitive means for recovering costs of new transmission.

Over the next several years, PacifiCorp looks forward to making historic strides to expand renewable energy development in the Northwest. We thank you for your leadership in this area and look forward to working with you in the years to come.

Senator SMITH. Well, thank you, Stan. So our audience understands further, I’ll elaborate a little on what he was saying.

In the Senate there was a real ideological debate and conflict over whether you just mandate renewable portfolio standards or whether you incentivize through the tax code the development of what would qualify as renewable resources.

My own voting, if anybody cares about it, it was to do both, to have a mandate, but then to provide the incentives to meet it. I was hoping that this dual track approach, which I think is the one that will get the best result with more winners, and fewer losers.

Ultimately, we're all going to pay for the energy we use. We simply need to go that way and go there faster, and my view was a blending of the two ideologies was the best way to get there.

Stan, I wonder, when evaluating coal versus nonemitting renewables, whether you factor carbon emissions into your resource planning?

Mr. WATTERS. We do. In fact, we were the first utility in the country, I think, to put CO₂ adder into our integrated resource plans, that when we are evaluating resources on what would be the least cost resources, that we do penalize CO₂, burning fossil fuel generation.

Senator SMITH. That's commendable. What are the major challenges to integrating wind generation with other generating resources?

Mr. WATTERS. Well, fortunately here in the Northwest, we have a lot of hydroelectric power, which enables us to integrate I think far more. I think the real challenge is—

Senator SMITH. What is your hydro portfolio?

Mr. WATTERS. We are about 1,100 megawatts total.

Senator SMITH. And of your total energy, what portion does hydro represent?

Mr. WATTERS. Hydro is about 15 percent.

Senator SMITH. 50?

Mr. WATTERS. No, 12. It is right in that area. It is hard to keep track of that number, because we continue to grow and add additional resources.

But to integrate wind, what's really important, of course, is the transmission infrastructure that's required.

We do have a lot of constraints in the Northwest now, where historically we have not. The transmission system is, I don't want to say over-sold, but it is pretty close to its capacity. There are a few areas where additional generators can be brought in without adding significant infrastructure.

I think the other is, when you are running an electrical system, you have to follow the loads of your customers, and your generators are generating power. And in order to follow wind, you need to use other generators to supplement that, because it is moving constantly up and down. And hydro resources are very good resources to do that, because they can move very quickly.

Senator SMITH. And it is just constant. When it is going, when you are turning the turbines.

Mr. WATTERS. Right. But it's very variable, too, on the system. We have had situations with some of our wind farms, especially on hot days, where you don't get much generation out of them, and they can fluctuate.

So, we need to be able to follow, what I say, follow the wind generation and provide—in providing reliable service to customers.

Other types of resources that are difficult to move quickly to respond to that type of variability, such as large coal plants and others.

So really the Northwest is in a good position to be a leader in the development of wind generation in the country. It has the right type of resources. But it will require additional transmission infrastructure to achieve even the goals that we have laid out for ourselves, even absent having a renewable portfolio standard.

Senator SMITH. One of the things I find as I talk energy around the state is that very few people understand that when you create electricity, you have to use it or you lose it. You can't store it, like you can water or something else. It's use or lose. And the wind doesn't always blow.

Mr. WATTERS. Exactly.

Senator SMITH. And so that makes it going in and out of the transmission grid difficult at times to predict. And that's why you've got to have other sorts of energy facilities feeding in when the wind isn't blowing.

So it's a juggling act you have to do, and I commend you for doing it.

Mr. WATTERS. Thank you.

Senator SMITH. Mr. Simpkins.

STATEMENT OF ERIC SIMPKINS, VICE PRESIDENT—BUSINESS DEVELOPMENT, IDATECH

Mr. SIMPKINS. If we believe the theory that a good picture saves a thousand words, we can save a lot of my language with a power point presentation that I have brought today.

Senator SMITH. Good.

Mr. SIMPKINS. If I could move to the podium. It's a hard copy so you're not tortured. It is double sided.

Senator SMITH. Yes.

Mr. SIMPKINS. Mr. Chairman, I appreciate the opportunity to appear before you today and discuss economic and societal benefits of America's fuel cell technology. America's economic development is coupled with the use of renewable energy and the resulting beneficial societal impacts to energy independence and a clean environment.

Beginning with his National Energy Policy Report in 2001, President Bush and Vice President Cheney have established a clear path for the Nation to achieve a clean, secure and affordable energy future to advance energy technology.

He has launched initiatives with fuel cells in hydrogen, in applications including stationary, portable, and transportation applications. The pre-automotive market induction of stationary and portable fuel cell technologies will define the basis for transportation uses in years to come.

As the President of our industry's trade association, the U.S. Fuel Cell Council, I can provide you with a description of fuel cells and their associated economic benefits, specifically for the Pacific Northwest.

As a business development representative from Oregon's largest and most commercially advanced fuel cell company, I can provide insight with respect to IdaTech's fuel cell systems and the pathway for their market adoption and widespread use throughout the country.

IdaTech is a high tech growth business headquartered in Central Oregon. The company develops fuel cell systems for a range of customers, including military, telecommunication markets, remote applications, and specialty interests.

To familiarize you with fuel cells I will briefly describe three systems that currently serve these applications.

IdaTech's ElectraGen family of backup power systems includes, pictured here, three kilowatt and five kilowatt power plants. The ElectraGen family is being evaluated and deployed by the telecommunications community in Europe and the U.S. and the utility community in Europe. There are two versions of this. One pictured here that's fueled with bottled hydrogen, and another version, the ElectraGen extended run module, or XTR, which is fueled with a liquid fuel that generates hydrogen internally through electric generation.

This system can be fueled therefore with bio-methanol or other renewable feed stocks for powering, for example, an airport tug at PDX, or for a telecommunications tower sited deep in the Cascades.

Fuel cells can operate with a number of renewable and conventional fuels. As with any fuel, their emissions are clean water and usable heat.

Shown here is a comparison of the equivalent amount of renewable fuel, in this case, bio-ethanol, derived from wood waste. With bottled hydrogen for 48 hours of operation of a five kilowatt ElectraGen backup power system, using the extended run module for long-term operation.

Fuel cells can be integrated with other renewable resources such as photovoltaic panels. That's a tough one. Remote applications where utility wires are not often portable.

Several IdaTech 1 kilowatt hybrid solar/fuel cell systems are powering farms in southern France too remote for service from the electric grid.

Renewable fuels typically associated with fuel cells include bio-methanol, cellulosic ethanol, bio-diesel and synthetic fuels.

The benefits of fuel cell systems are compelling. They are environmentally benign. The fast growth fuel cell industry is generating jobs, with excellent wages.

For example, IdaTech has grown from a three-person garage shop start-up 10 years ago to a 68 employee technology business working in a 45,000 square foot facility.

IdaTech procures over \$700,000 in materials and services in Oregon and nearly double that figure in the Pacific Northwest Region. IdaTech contributes over \$13 million to the region in salary, benefits and indirect dollars.

Fuel cells replace conventional power generation systems that pollute the air and pose a toxic waste disposal issue. Fuel cells are a technology that do not require petroleum fuels for power generation.

As with any new power technology, fuel cells benefit from incentives to aid in market introduction. The Federal Government has established an investment tax credit for which you were instrumental in securing Senate passage. Thank you.

The Energy Policy Act of 2005 authorized a market transition program where the governments would use fuel cells in new and renovated Federal buildings. These incentives are important.

However, state incentives will hasten regional market introduction. IdaTech qualifies for the Oregon Business Tax Credit, 35 percent R&D credit, and the 35 percent tax credit for acquisition and installation of a fuel cell system to the owner.

But the immediate need is for assistance in conducting fuel demonstrations to expose future power users to on-site fuel cell power generation.

Currently there's no mechanism for funding these demonstrations. Government policy embracing renewal fuel cell power generation, coupled with financial support from early demonstrations in the Pacific Northwest would be especially helpful.

Therefore, in anticipation of future market exceptions to fuel cells, there is a developing effort within the Western States contracting alliance for the identification of qualified fuel cell vendors. IdaTech has applied for this, and for establishing a standard purchase contract similar to the Federal GSA Schedule.

At last, beyond the advantages of environmentally clean and affordable on-site power generation, the fuel cell industry benefits state and national energy policies.

The technology reduces dependence on foreign oil. It gives utility systems another tool in their portfolio of power generation solutions. Fuel cells are environmentally clean and contribute to the growth of Oregon's green energy cluster.

Thank you, Mr. Chairman, for the opportunity to provide testimony and thank you for your leadership in the energy area.

[The prepared statement of Mr. Simpkins follows:]

PREPARED STATEMENT OF ERIC SIMPKINS, VICE PRESIDENT—BUSINESS
DEVELOPMENT, IDATECH

Mr. Chairman, I appreciate the opportunity to appear before you today to discuss the economic and societal benefits of America's fuel cell technologies.

America's economic development is coupled with the use of renewable energy and the resulting beneficial societal impacts to energy independence and a clean environment. Beginning with his National Energy Policy Report in 2001, President Bush has established a clear path for our Nation to achieve a clean, secure and affordable energy future through advances in technology. He has launched initiatives with Fuel Cells and Hydrogen in applications including stationary, portable and transportation uses. The pre-automotive market introduction of stationary and portable fuel cell technologies will define the basis for transportation uses in the years to come.

As the President of our industry's trade association, the U.S. Fuel Cell Council, I can provide you with a description of fuel cells and their associated economic development benefits specifically for the Pacific Northwest. As the Business Development representative from Oregon's largest and most commercially advanced fuel cell company, I can provide insight with respect to IdaTech's fuel cell systems and the pathway for their market adoption and widespread use throughout the country.

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IdaTech's ElectraGen™ family of backup power systems includes 3 kilowatt and 5 kilowatt plants. The ElectraGen™ family is being evaluated and deployed by the telecommunications community in Europe and the U.S. There are two versions—one pictured here that is fueled with bottled hydrogen, and an ElectraGen™ XTR module fueled with a packaged liquid fuel that generates hydrogen internally for electricity generation. This system can be fueled with biomethanol, or other renewable

feedstocks for powering, for example, an airport tug at PDX, or for a telecommunications tower site deep in the Cascades.

Fuel cells can operate with a number of renewable and conventional fuels. With any fuel, their emissions are clean water and usable heat. Shown here is a comparison of the equivalent amount of a renewable fuel, in this case biomethanol derived from wood waste, with bottled hydrogen for 48 hours of operation of a 5 kW IdaTech ElectraGen™ Backup Power System with an ElectraGen™ XTR Module for long-term operation.

Fuel cells can be integrated with other renewable sources, such as photovoltaic panels, for remote applications where utility wires are not affordable. Several IdaTech 1 kilowatt hybrid solar/fuel cell systems are powering farms in southern France too remote for service from the electric grid. Renewables fuels typically associated with fuel cells include biomethanol, ethanol, biodiesel, and synthetic fuels.

The benefits of fuel cells are compelling. They are environmentally benign. The fast growth fuel cell industry is generating jobs with excellent wages. For example, IdaTech has grown from a 3 person garage shop start-up to a 68 employee technology business working in a 45,000 square foot facility. IdaTech procures over \$700,000 in materials and services in Oregon, and nearly double that figure in the Pacific NW region. IdaTech contributes over \$13,000,000 to the region in salary, benefits and indirect dollars.

Fuel cells replace conventional power generation systems that pollute the air, and pose a toxic waste disposal issue. Fuel cells are a technology that does not require petroleum fuels for power generation.

As with any new power technology, fuel cells benefit from incentives to aid in market introduction. The Federal Government has established an Investment Tax Credit for which Chairman Smith was instrumental in securing Senate passage. The Energy Policy Act of 2005 authorized a market transition program wherein the government would use fuel cells in new and renovated Federal buildings. These incentives are important, however state incentives will hasten regional market introduction. IdaTech qualifies for the Oregon Business Energy Tax Credit, a 35 percent Research & Development credit, and a 35 percent tax credit for the acquisition and installation of a fuel cell system. But the immediate need is for assistance in conducting field demonstrations to expose future power users to on-site fuel cell power. Currently there is no mechanism for funding field demonstrations. In anticipation of future market acceptance of fuel cells, there is a developing effort within the Western States Contracting Alliance for the identification of qualified fuel cell vendors, and for establishing a standard purchase contract similar to the Federal GSA Schedule.

And last, beyond the advantages of environmentally clean and affordable on-site power generation, the fuel cell industry benefits state and national energy policies. The technology reduces dependence on foreign oil. It gives utility systems another tool in their portfolio of power generation solutions. Fuel cells are environmentally clean, and contribute to the growth of Oregon's Green Energy Cluster.

Thank you, Mr Chairman, for the opportunity to provide this testimony. I will be happy to answer questions on this subject.

Senator SMITH. Thank you, Eric. What's the life of a fuel cell?

Mr. SIMPKINS. The market requires the life of a fuel cell to—as a fully integrated system, to be about five years, for small, portable—

Senator SMITH. Any disposal issues with them?

Mr. SIMPKINS. There is no disposal. We are able to reclaim most of the materials. Today we're not at that market introduction point. We have a lifetime of about 10,000 hours, or a little over a year-and-a-half.

Senator SMITH. It is my understanding that the telecommunications industry is using these fairly extensively. Is that correct, and if so, why?

Mr. SIMPKINS. The telecommunications industry has the most difficult certification requirements for on-site power systems, particularly the remote ones. They just can't afford failure.

Senator SMITH. I See.

Mr. SIMPKINS. Battery systems, small internal combustion engines, require a great deal of maintenance, and they are expensive to maintain.

Fuel cells don't require maintenance. We change an air filter or a water filter occasionally. We change a fuel cell stack, that's the cap that generates the electricity, once every couple to three years.

Senator SMITH. You heard us talking around the whole issue of transmission, congestion, and the grid. It is one of the bottlenecks that we've got to get around as we bring on all these new energy sources.

But do you see fuel cells as being one of the solutions to those bottlenecks?

Mr. SIMPKINS. Fuel cells is one of the solutions. The Director of the National Energy Technology Laboratory at one time said that "if we use all of the technologies that are available everywhere, including nuclear, we will not meet the power demands of this planet in the year 2020."

So, fuel cells can be a component of that. A couple benefits are, they can be sited anywhere, particularly at the load, and they are very clean.

Senator SMITH. That's very helpful, and we thank you for what you're doing.

We'll now turn to Scott Spettel. Thank you. Welcome.

STATEMENT OF SCOTT SPETTEL, POWER MANAGEMENT AND PLANNING MANAGER, EUGENE WATER AND ELECTRIC BOARD

Mr. SPETTEL. Thank you, Mr. Chairman. I am the Power Management and Planning Manager for the Eugene Water and Electric Board. EWEB is pleased to be a partner with U of O in developing such a terrific building that we are in.

I would note that we are purchasing the output of the photovoltaic panels that are embedded within this building.

Senator SMITH. They are attractive, too.

Mr. SPETTEL. Yes, they are. In my testimony I would like to share EWEB's experience and insights into policy issues, such as Congressional funding for their renewable energy production incentive, REPI. That's the municipality equivalent of the production tax credit.

I would stress the importance of extending the production tax credit, especially over a sufficient planning horizon so that developers can count on that being there as they're planning to bring their projects into fruition.

I would also like to touch on constraints of EWEB's use of clean energy renewable bonds, CREBs, as well as suggest some possible goals for the Bonneville Power Administration to take, or to continue taking in the area of renewable resource development and economic development.

I'd like to say the lights in this room are brought to you through EWEB's renewable energy portfolio.

We have hydro-electric projects, not only locally along the McKenzie River, but one as far away as Boundary County, Idaho. We own 21 percent of the Foote Creek Rim wind project located at Carbon County, Wyoming. We are partners with Stan. I've learned

more about transmission with that project than I care to think about.

We also own a high-efficiency co-generation unit, located at the Weyerhaeuser container board facility in Springfield, and a similar unit that we share with the Clatskanie PUD located in Wauna, Oregon.

Those two units have really stressed to me the importance of increased efficiency at these industrial facilities to maintain their competitiveness in Oregon.

I would like to add we are purchasing about 150 KW of solar photovoltaics located in five different areas within our service area.

Senator SMITH. Those are just out in the field somewhere?

Mr. SPETTEL. You will see some on rooftops of various buildings. So they are primarily on rooftops of commercial customers.

Senator SMITH. How much does their output fall when the sun's not shining in Eugene?

Mr. SPETTEL. Well, we have sponsored—

Senator SMITH. I know it always shines here.

Mr. SPETTEL. Surprisingly, it maintains fairly good output even on the cloudy days.

I was surprised to find out through our solar monitoring program that we have with the U of O physics department that solar installation in Eugene is quite comparable to some areas that we think of being quite sunny in the Nation.

Senator SMITH. I'm asking this for my own information, and perhaps some in the audience, but when you go from a sunny to a cloudy day, what is the drop in the electricity?

Mr. SPETTEL. I'd have to check the details. I'm afraid I can't throw out a number.

Senator SMITH. But it still works. We've got a hand up in the audience. Maybe he can educate us.

Mr. MAYNARD. I am Bob Maynard with Energy Outfitters.

We have been working with photovoltaics for over 20 years in Oregon.

The best way, our tests and the best way to explain it in good simple terms is, if a bright, sunny day with perfect blue sky is a hundred percent output, a day with a very, very thin layer of gray overcast, but it's still bright enough outside to see a hazy outline of your shadow and maybe even cause you to squint, is approximately 50 percent output. A heavy gray overcast day, we're down to the neighborhood of about 10 percent output. And on a really dark, stormy day, there's enough energy there typically to turn on the lights and the controls of the power electrodes but not really generate power.

Senator SMITH. That's very helpful. I appreciate very much you sharing that with me. That's sort of what I expected it to be. But you've confirmed what my expectations were. Thank you.

Go right ahead.

Mr. SPETTEL. Over the past 15 years, EWEB Board of Commissioners last directed staff to continually acquire the output of renewable resources. This is not only because they are less impactful to the natural environment but it helps produce a diverse power supply for utility as well as hedge price volatility that characterizes

alternative sources of power supply available in the wholesale market.

Therefore, renewable resource acquisition is more than just a concept of we do it to meet load growth. It is really a larger endeavor to diversify our entire resource portfolio.

I'll say a few comments about some specific projects.

One, our first experience with wind power was the Foote Creek Rim Project in Wyoming, right in the heart of coal country. As a municipal owner of that facility, we are eligible for and have been receiving payments through the renewable energy production incentive.

However, that program must be appropriated periodically by Congress, and right now we're a little short. So, in terms of really counting on that money being there, it's difficult for us to really rely on that when we evaluate the economics of a wind project, because it may be there, it may not be there. We might be coming back and asking for some help in appropriating sufficient funds to fully fund that program.

As part of our experience with that wind project, we developed a retail wind power marketing program. That gives interested customers the option of purchasing the wind power commensurate with the output of that facility and paying the cost of that facility, so as power prices go up and down, due to various regions, and if you were in that program, your price stays at the price of that renewable energy project.

I'd also note that we sell green tags to the University of Oregon's Earp Memorial Union. So after the hearing, if you have a cup of coffee, that cup of coffee was brewed with environmentally sound power.

Senator SMITH. If I was not a Mormon, I would have one with you. But I encourage you to drink mine.

Mr. SPETTEL. Stateline Windpower Project, on the Oregon-Washington border, that was our second bite of wind power.

Because of our concerns with the REPI, we chose to structure this as an output purchased from a private developer that could lock in the benefits of the production tax credit and again these developers are telling us they need not only a two-year planning horizon where that leads to boom and bust cycles in resource development, but they'd like to see that extended on a five-year basis so they can rely on those tax credits and fold them into their business plan.

That project also highlighted that wind is intermittent, and not only from hour-to-hour but from within the hour.

We'd like to applaud the efforts of the Bonneville Power Administration to continue investigating sound and economic ways to use the region's resources to integrate the output of intermittent renewable resources.

Senator SMITH. We're leaning on them to do that, too, and they've been responsive.

Mr. SPETTEL. Yes, they have. I'm quite impressed. I would also like to stress the importance of maintaining the operating flexibility in the region's hydro system, including some of our own projects, one that is going through relicensing currently. If we lose the ability to move that project on a minute-by-minute, hour-by-

hour basis, we'll lose the ability to integrate additional increments of wind power.

Senator SMITH. OK.

Mr. SPETTEL. The Tieton Hydroelectric Project. It is under commercial test and it should be online by the end of the month.

Again, the developer is having some—reports they are having difficulty monetizing the production tax credit benefits.

It's a very small operation, family run business that is really the developer, and they don't have the tax appetite for the PTC. They need to sell that or transfer that to some larger financial institution. And for some of these smaller projects, that's just a difficult step to take.

A quick word about the Bonneville Power Administration's new large single load green exemption program. That's a program whereby if a large industry in the region that currently is not eligible to be served with Bonneville Power, if they meet all but 10 megawatts of their load with on-site cogeneration or qualifying renewable energy, then they are eligible to get 10 megawatts of low-cost power from the Bonneville Power Administration.

We're working with the Emerald People's Utility District, one of their customers, Pope & Talbot, and BPA, to allow Pope & Talbot to take advantage of that program.

And if we are successful before that program expires in December of this year, then that will be a significant economic development boon to that industry that's operating in a very competitive market.

Two other resources. We have just completed negotiating a contract for a third increment of wind power, and that's the Klondike III ProjEct located in Sherman County, Oregon. We considered the use of clean energy renewable bonds, if we were to own that project, but basically because we have competing needs for a balance sheet, even though those come at an attractive interest rate, we simply had difficulty folding them into our overall portfolio, given the other bonding needs that the utility was facing.

Senator SMITH. It sounds like they are doing it anyway, though.

Mr. SPETTEL. So we went through a purchased power—

Senator SMITH. Not the bonding, but you're providing the renewables—

Mr. SPETTEL. We are relying on the production tax credit and a private developer to bring that project to us.

Geothermal. As some of you know, we at EWEB were active in the mid-1990s with a private company exploring for geothermal at the Newberry Crater location in Central Oregon. That effort did not produce evidence that a commercial geothermal project could be brought online.

Senator SMITH. Is that because the volume wasn't sufficient?

Mr. SPETTEL. Well, there are two things you need. You need heat and you need fluid to transfer that heat. And while the geothermal industry is interesting, they are very proprietary about the results of their exploration. I think it is fair to say that they found one but not the other in their exploration.

Senator SMITH. They found the heat but not the water.

Mr. SPETTEL. Yes. Indeed. Which is unusual for the Northwest. I would have thought it would have been the other way around.

Senator SMITH. Kind of like the Senate.

Mr. SPETTEL. In the alternative, EWEB is underway in negotiating a contract to purchase output from the proposed Raft River Geothermal Project located in southeastern Idaho.

We would not be able to do that without the assistance of BPA who has offered to exchange power. BPA has loads in Idaho, and if we earmark the output from that geothermal project for use in Idaho, they'll deliver us a commensurate amount at Grand Coulee or here on the west side.

Finally, what does it take to really bring on the quantities of renewable energy that we're talking about?

In real estate, it is location, location, location. And here it is transmission, transmission, transmission.

I'm not just talking about major lines from the areas such as Montana and Wyoming that have a lot of potential, but even here in the I-5 corridor. I think of it as being similar to the in-state highway system built in the 1950s and 1960s, kind of running out of steam, it needs some attention.

And that is going to be the constraint that we're facing over the next 10 to 15 years, and I'm hopeful that the Bonneville Power Administration will have access to sufficient financing to maintain and improve that system.

Senator SMITH. Well, you might have read, if you follow these issues, one of the fights we've had with the Bush Administration and the Clinton Administration, is sufficient bonding authority for BPA to add to transmission capacity.

Mr. SPETTEL. Right.

Senator SMITH. Somebody mentioned the number, it's like a million dollars a mile to put these lines in. And nobody wants transmission lines near them. I understand that. Shoot, I live in eastern Oregon. I've got wind mills all around me. And I'm a big proponent of wheat and wind. That's how my neighbors stay in business.

But almost with everything we do with energy, there is some environmental offset, and there is an inconvenience in terms of transmission lines.

And I don't think they are attractive at all. I understand the resistance. I certainly understand the feelings of the Tribe, they don't want them running through their reservation, and I respect that.

But the whole "not in my backyard" approach is proving very problematic. And your point is exactly right. We've got a 1950s highway system and we've never updated it.

Yet our economy can't grow without energy. It's just that simple. Our economy also needs to grow with the right kinds of energy. And the big bottleneck we're running into is getting the dollars, getting the investments through bonding, through BPA, so that the Northwest can have a modern system to transmit this electricity.

Frankly, the California crisis of a few summers ago was in part, largely triggered by transmission congestion. The system just got overloaded, burnt up, and California went black. Then there wasn't enough electricity being generated behind that, and it's just simply an antiquated system. I just tell you this for your own information. It is something that we are struggling with, trying to get it right, so we can keep your lights on and do so at affordable rates.

But, Scott, one of the things I want to say publicly, is what a pleasure it has been for me over the last 10 years to work with EWEB. You guys are great. I appreciate your efforts to get in there and rough it up with the big boys and stay competitive and get your part of BPA power. And I admire what is obviously your effort to expand a renewable portfolio. As you talked about, you offer green energy as well.

Mr. SPETTEL. Right.

Senator SMITH. How much more is that to an average ratepayer?

Mr. SPETTEL. At the moment, our wind power program is commensurate with the middle tier of our retail residential rate. So, it's not much more at all.

Senator SMITH. OK. Do you envision the day, as I do, that there won't be a difference between green and other power?

Mr. SPETTEL. Absolutely. I think in the future, that the green technologies will be setting the market.

Senator SMITH. Frankly, I share this view with you. We just have to get renewables to a volume where the volume creates economies of scale that create an ability to price green, the same as you would any fossil energy.

And we're not there. But we're pushing hard to get there, with mandates and incentives. So, thanks, Scott.

Senator SMITH. Now I want to brag on Dr. von Jouanne, who dazzled me, with the tour she gave me at OSU on wave energy. And I've got to tell you, if you want renewables and you want to see the future of this great emerging category, Dr. von Jouanne is leading some smart students and producing some remarkable technologies. We now need to commercialize this so that we can get them sited in places where it's not harmful to fish and that produces gobs of electricity.

Did I give your speech?

**STATEMENT OF DR. ANNETTE VON JOUANNE, PROFESSOR,
ELECTRICAL ENGINEERING AND COMPUTER SCIENCE,
OREGON STATE UNIVERSITY**

Dr. VON JOUANNE. Well, thank you very much, Senator. It is indeed an honor to share with you about wave energy, and also specifically about the economic development opportunities in this very emerging renewable industry.

And just a reminder, when we talk about wave energy, we're talking about harnessing the energy in that linear motion of the wave and converting that into electrical energy.

And wave energy has some significant advantages, very untapped advantages in that if we look at energy density, you look at the density of water compared to air, it's over 800 times greater. Also if you look at availability and also predictability.

So, significant advantages that I can go into more detail on.

Senator SMITH. Waves don't stop happening even when the wind stops blowing?

Dr. VON JOUANNE. It's definitely a much more consistent resource. It is a seasonal resource, but we have a tremendous wave energy climate off the Oregon coast.

Senator SMITH. Describe the seasonality for the audience.

Dr. VON JOUANNE. Absolutely. So, if we think about waves in the winter, they average about 3.5 meters, and in the summer they average about 1.5 meters.

Now, if we convert that into raw energy, the energy available in the winter waves is equivalent to about 50 kilowatt per meter of crest length. An average coastal home is about 1.3 kilowatt. So that 50 kilowatt per meter of crest length traveling toward shore already has a tremendous wave energy potential.

And if you look at an overall average, and we look at between 10 kilowatt in the summer months and 50 kilowatt in the winter months, an overall average might be about 30 kilowatt per meter of crest length coming toward you, coming towards the shore.

We have an Oregon coast line of about 460 kilometers. That is equivalent to an average of about 13,800 megawatt of raw energy. Our average electricity consumption in the state is about 5,000 to 6,000 megawatt. So that 13,000 megawatt of raw energy off the Oregon coast could make a substantial impact on our renewable energy portfolio.

Senator SMITH. But obviously you can't put them along the whole coast.

Dr. VON JOUANNE. That's right.

Senator SMITH. Would you describe for the folks here what you have told me about what are the environmental trade-offs with wave energy in terms of fish?

Dr. VON JOUANNE. So when we talk about a wave park, we talk about an array of buoys that would be located about one to three miles off the coast and in about 100 feet of water or greater.

And this is, because we want to capture that energy before those waves start to crest. And these would be buoys that would be spaced by about 100 meters, and the first proposed commercial wave park is being developed for about a 20 megawatt site, and this is what we are looking at off of the Reedsport/Gardener area, and that site would be about 3 miles that would be parallel to the coast by about 3,000 feet. So—

Senator SMITH. And you are out a mile, as well?

Dr. VON JOUANNE. Yes.

Senator SMITH. So you won't see the buoys.

Dr. VON JOUANNE. That is right. They would be virtually invisible to the naked eye from the shore, which is a very important aspect for Oregonians.

And let me add, we are working very closely with the Oregon fishing and crabbing communities, as well as about 40 agencies which are being coordinated by the Oregon Department of Energy.

This has been a tremendous collaboration of utilities, and state agencies, in order to very responsibly look at wave energy development off the Oregon coast.

And we have some really strategic advantages here in Oregon which set us in a very good position to be a leader in the world as well as the Nation for wave energy research, development, and production.

So the advantages that we have are, first off, strategic facilities such as at Oregon State University. Our energy systems lab is the highest power energy systems lab of any university in the Nation. We are already doing a lot of renewables work, as you saw. We are

able to fully regenerate back onto the grid. And that enables us to really comprehensively research and test renewable technologies.

Then we have the O.H. Hinsdale Wave Research Lab, which is one of the largest systems of wave basins in the world.

We then have the Hatfield Marine Science Center there at Newport, and tremendous potentials off the Oregon coast.

You think about how waves develop. Waves are really a concentrated form of solar energy in that the uneven heating of the Earth's surface creates the wind and the wind generates the waves. And we have those waves building up all the way across the Pacific, and that's why our wave resource is so much stronger here on the West Coast than it is on the East Coast.

In addition to enabling the Nation's first commercial wave parks, we are working to establish a national wave energy research and demonstration center with the research headquartered at Oregon State and with demonstrations off of Newport, Oregon. And we are very excited about those opportunities.

And specifically today, I'd like to discuss the wonderful economic development opportunities.

So, if you might recall that the 2005 Oregon legislature created the Oregon Innovation Council, Oregon, Inc., to enhance the state's capacity for innovation, technology development and production.

With wave energy, we have fortunately risen to the top as an economic development opportunity for Oregon, based on potential for high growth and high wages, and for Oregon to be a leader in global markets.

Oregon, Inc.'s Commercialized Research Committee has identified clean energy, including wave energy, as a key part of a new signature research center and the Council is now developing its innovation plan to present to the 2007 legislature to maximize the potential of this emerging industry.

So, with the explosive growth of the industry on the horizon, really hundreds of jobs could be created in the next 10 years to support the fabrication and services of wave energy projects in Oregon. And also to support the export of equipment to other countries.

Wave energy will add many high paying jobs to the local coastal economy with the new needs in permitting, professional services, manufacturing, final assembly and operations and maintenance.

Wave energy will also provide significant opportunities for the creation of new businesses here in Oregon.

The most significant barrier to wave energy development is the above-market cost of the electricity. Due to the early stage of this industry, the current cost of electricity production from waves is estimated to be severaltimes the market price, similar to where wind was when it was emerging about 20 years ago.

Senator SMITH. Say that again, how much does its cost?

Dr. VON JOUANNE. OK. So, if we look at cost specifics, we are looking at wind with subsidies at about 4 cents a kilowatt hour.

Wave energy right now is coming in at about 20 to 30 cents a kilowatt hour, based on the type of technology. We at Oregon State University are trying to drive what's called these direct drive concepts, where we directly convert the linear motion of the wave into

electrical energy, avoiding hydraulics and pneumatics. So we hope that also with volume, that we will be able to bring that cost down.

So, to ensure wave developers are attracted to Oregon, we need to establish a production incentive that will offset the above-market costs of producing wave generated electricity.

The production incentive mechanism would be tiered over the next 10 years to track the reduced cost of production. Discussions addressing these barriers and also finding solutions are under way at the state level through the Oregon, Inc. process. However, at the Federal level, it is critical that wave energy receive a similar incentive mechanism to the production tax credits that the wind industry receives. And assistance in this effort is greatly appreciated.

Senator SMITH. I can help.

Dr. VON JOUANNE. Thank you. So, again, Oregon is really poised to lead the Nation and the world in wave energy research, development, and production. We have the wave resource, the expertise through a lot of tremendous collaboration, from utilities, the industries, the community, the crabbing and fishing industry, and we also have a tremendous utility infrastructure along the coast.

Senator SMITH. So you don't have a transmission issue.

Dr. VON JOUANNE. We don't have a transmission issue, which is very, very fortunate.

PGE has estimated that we could input about 2,000 megawatts of electric energy from the coast without having to develop additional transmission infrastructure. That puts Oregon again really poised to be a leader in the Nation, in the world in this area.

Senator SMITH. If we get this up to sufficient volume and by your using the linear motion as opposed to hydraulics and other types of wave energy machines, how close do you think you can get to the wind energy cost?

Dr. VON JOUANNE. Very close. In fact because of the advantages that we talked about, energy density, availability; when you talk about availability—

Senator SMITH. And constancy.

Dr. VON JOUANNE. Yes. You look at the numbers, and the availability of wave energy, that is how often are the waves rolling compared to how often is the wind blowing. Wave energy availability is about 80 to 90 percent.

Wind energy is about 35 to 45 percent, depending on location.

And we are very strong supporters of wind energy and solar energy, and we are looking at the opportunities for combining wave energy into our natural resource.

Also the predictability. We have buoys out there 200 miles, and they are telling us the wave climate, what the wave magnitudes and periods are. Those waves differ very little from 200 miles off to a few miles off where these wave parks would be located.

So, we would have about 10-plus hours of forecast time to be able to tell the grid what a wave park would be putting on.

Senator SMITH. Are those buoys the same ones we have out there for tsunami protection?

Dr. VON JOUANNE. Those buoys, they would have similar characteristics as far as coatings and protection and moorings, but these devices would be much larger.

Senator SMITH. These are different buoys?

Dr. VON JOUANNE. Yes. Those ocean monitoring buoys would be giving us the information we would need—

Senator SMITH. So they would be tied to your system. They are not existing buoys—

Dr. VON JOUANNE. We have existing buoys out there—

Senator SMITH. Is that what you would look at for the information?

Dr. VON JOUANNE. Right. We would work together with NOAA in order to develop a very reliable system in order to be passing on the information of what the wave climate is.

Senator SMITH. What are the environmental impacts? You mentioned them to me when I asked at OSU. But as I recall the conversation, you said the only environmental impact might be the magnetism that's created will attract fish. Would you net around them, or what would be the impact to the fish?

Dr. VON JOUANNE. So, that is one of the environmental impacts, is that these buoys, they are electromechanical devices. They generate electromagnetic fields, and marine life is attracted to electromagnetic fields.

We are able to shield these buoys, as we do other electromagnetic systems, and that's all a function of cost. So, we really need to do research to determine how much do we need to shield these.

Senator SMITH. So you're not going to be electrocuting fish?

Dr. VON JOUANNE. No, not at all. So, you may be familiar, there are actually books on how to fish with electromagnetic fields.

Senator SMITH. So unlike ODF, which electrocutes all the hatchery salmon, you don't do that?

Dr. VON JOUANNE. No.

Senator SMITH. OK. So, technologically, we can get around this issue.

Dr. VON JOUANNE. Absolutely, yes.

Senator SMITH. And it won't drive the fish crazy.

Dr. VON JOUANNE. Right. And they have done studies that fish learn. At first it is something that they are very curious about, and then they learn, okay, there is a field there, and they go on their way.

However, we do want to ensure that we don't disrupt the marine life patterns, and so we want to do the proper research and how much we need to shield.

Senator SMITH. Are you working with utilities or companies to commercialize this?

Dr. VON JOUANNE. Yes, we are.

Senator SMITH. I mean, is OSU going to be the investor, are you going to get a return on this, or will it be the companies, or both of you?

Dr. VON JOUANNE. We have investor companies that have contacted us because they are very interested in our direct drive technologies.

We also have military that have contacted us. Navy, in particular, is very interested in implementing our direct drive technologies. So, we are working with a variety of different entities.

We are also currently building a very large linear test bed in our lab in order to create that relative motion that you find in the waves right there in a dry setting in the lab.

And that's right now one of our big research efforts, and that would really enhance our capabilities to show the nation a national wave energy center needs to be located somewhere in the U.S., and at OSU and the State of Oregon is an ideal location for that.

We really do need to keep pace with what's happening around the country—really, the world, in that the European Marine Energy Center was formed a couple years ago, and for us to ensure that the market is here in the U.S., we don't want the same thing to happen that happened in the wind industry, that it is all taken into the European market. We want the wave energy market to be here in the U.S.

Senator SMITH. Are the Europeans ahead of us at this point?

Dr. VON JOUANNE. Yes, they are, because of the Federal subsidies, just as they were in wind. And if you look at the statistics, wind is a \$60 billion industry, and Denmark who had the Federal subsidies, has over a third of that industry in what they have in the country as well as exporting. So, there is a tremendous potential.

Senator SMITH. But the Beavers are going to do to them what they did to Notre Dame, right?

Dr. VON JOUANNE. Well, with the proper support, that's what we'll do.

Senator SMITH. Annette, I could talk to you all day about this. I'm so excited about what you've got going there.

[The prepared statement of Dr. von Jouanne follows:]

PREPARED STATEMENT OF DR. ANNETTE VON JOUANNE, PROFESSOR, ELECTRICAL ENGINEERING AND COMPUTER SCIENCE, OREGON STATE UNIVERSITY

It is an honor to share with you today about Wave Energy, and the economic development opportunities in this emerging renewable industry.

First, when we talk about Wave Energy, we are talking about harnessing the linear motion of the waves, and converting that into electrical energy.

Wave Energy is an untapped resource with three significant advantages: *energy density, availability, and predictability.*

We have an excellent wave climate off the Oregon Coast, and combined with our strategic facilities at Oregon State University, Oregon is in an excellent position to lead the nation and the world in Wave Energy.

For example, at OSU, we have the highest power Energy Systems lab in any university in the nation, where we have done a lot of renewables work, and where we can fully regenerate back on to the grid to comprehensively research and test renewable energy technologies.

In addition, at OSU we have the O.H. Hinsdale Wave Research Lab, which has one of the largest systems of wave basins in the world.

We also have the Hatfield Marine Science Center right there in Newport.

And again, we have excellent wave energy potentials off the Oregon Coast, where wave heights in the winter average 3.5 meters, which converts to 50 kW per meter of crest length. (Each coastal home is about 1.3 kW.) During the summer, we see average wave heights of 1.5 meters, which converts to 10kW per meter of crest length.

Considering an overall average of 30 kW/m, and an Oregon coastline of 460 km, the total Oregon Coast Wave Energy potential is in the range of 13,800 MW. The average electrical energy consumption in the state is about 5–6,000 MW, so that 13,000 MW of raw wave energy can have a significant impact on our renewable energy portfolio.

To properly explore these Wave Energy opportunities, we have been working closely with Oregon Department of Energy (ODOE) and about 40 other agencies, including the Oregon fishing and crabbing industries, to enable the Nation's first Commercial Wave Parks to be developed off the Oregon Coast.

We are also working to establish a National Wave Energy Research and Demonstration Center in Oregon, off Newport, with land-based facilities that could be integrated with the ongoing activities at the HMSC.

As you can imagine, this all points to several wonderful economic development opportunities.

Recall that the 2005 Oregon Legislature created the Oregon Innovation Council (Oregon, InC.) to enhance the state's capacity for innovation, technology development and product creation. Wave Energy has risen to the top as an economic development opportunity for Oregon based on the potential for high growth and high wages, and for Oregon to be a leader in global markets. Oregon, InC's Commercialized Research Committee has identified Clean Energy, including wave energy, as a key part of a new Signature Research Center. The Council is now developing its innovation plan to present to the 2007 Legislature to maximize the potential of this emerging industry.

With the explosive growth potential of the industry on the horizon, hundreds of jobs could be created in the next *ten years* to support the fabrication and services of wave energy projects in Oregon, and the export of equipment to other countries. Wave Energy will add many high paying jobs to the local coastal economy with the new needs in permitting and professional services, manufacturing, final assembly, and operations and maintenance. Wave Energy will also provide significant opportunities for the creation of new businesses in Oregon.

The most significant barrier to wave energy development is the above-market cost of the electricity. Due to the early stage of this industry, the current cost of electricity production from waves is estimated to be several times the market price, similar to wind when it was emerging 20 years ago. To ensure that wave developers are attracted to Oregon, we need to establish a *production incentive* that will offset the above-market costs of producing "wave" generated electricity. The production incentive mechanism would be tiered over the next ten years to track the reduced cost of production. Discussions addressing these barriers, and finding solutions, are underway at the state level through the OR InC. process. However, at the federal level, it is critical that wave energy receive a similar incentive mechanism to the production tax credits that the wind industry receives, and assistance in this effort is greatly appreciated.

Again, Oregon is poised to lead the Nation and the world in wave energy development. We have the wave resource, the expertise through collaboration including tremendous industry, utility and community support, and the utility infrastructure along the coast to deliver this clean, renewable power into the grid.

Thank you for your time!

Senator SMITH. I just want to commend you, and all of our witnesses. Thank you all for what you're doing. We do need to get to the second panel. You certainly have made this a meaningful hearing already. Thank you. All the best.

We will now call up our second panel that will consist of Katie Fast, the Associate Director of Government Affairs, the Oregon Farm Bureau in Salem; and the Honorable Mike McArthur, Executive Director, Association of Oregon Counties, in Salem; Bill Carlson of the Carlson Small Power Consultants in Redding, California; and Mr. Bob Maynard, of the Energy Outfitters in Grants Pass, Oregon. Gentlemen, we welcome you all, and, Katie, thank you.

**STATEMENT OF KATIE FAST, ASSOCIATE DIRECTOR,
GOVERNMENT AFFAIRS,
OREGON FARM BUREAU FEDERATION**

Ms. FAST. Thank you.

Senator SMITH. Katie, take it away.

Ms. FAST. Well, thank you for the opportunity to testify today on behalf of the membership, Oregon Farm Bureau.

For the record, Katie Fast, Associate Director, Governmental Affairs.

Oregon agriculture prospers from the diversity of its operations in the crops that we grow, and the renewable energy opportunities that we see add to the economic opportunities of our diversity.

Biofuels is just one of the renewable energy segments in which Oregon agriculture will be investing in.

Currently, there are two biofuel options that Oregon agriculture operators are most interested in, and they are biodiesel and ethanol. At this time, the biodiesel producing crop best suited for Oregon's growing condition is canola.

However, the Oregon Department of Agriculture has rules in place that prohibit canola production in certain areas of the state, and one example is here in the Willamette Valley. And this is due to concerns with interactions between canola and the high-value specialty seed industry. And it is with cross-pollination, disease issues and others.

Currently, the Department will be requesting funding from the Oregon legislature in an E. Board situation to investigate how these two industries can co-exist in the same areas, and also research alternative crops for biodiesel in these regions.

Nationally in the past two years the price of diesel for on-farm use has increased by nearly \$1.00 per gallon, or 74 percent. Due to these high energy prices, Oregon's interest in biodiesel has recently changed.

Two years ago, farmers were more interested in growing the crop and marketing the feed stock for biofuels.

Now I am talking to farmers who are wanting to grow the feed stock, crush it and process the feed to produce home grown fuel for their farms.

Many of these operations are analyzing the opportunities where they would utilize all the fuel they produce themselves on the farm and not market any of the crops or the fuel off.

Oregon agriculture is interested in looking into a pilot project and feasibility studies to further investigate these options.

Oregon will probably never produce the levels of corn needed to support a conventional ethanol industry, as a majority of the Oregon ethanol plants will be importing corn from the Midwest. However, Oregon does have the potential to support the cellulosic ethanol industry.

Cellulosic ethanol can be produced from a wide variety of biomasses. Our healthy agriculture and forest industries make Oregon a prime location for a cellulosic ethanol plant. Oregon's grass and wheat straw, combined with forest thinnings on private land and a full implementation on the Healthy Forest Act on Federal lands, create a strong base of cellulosic feed stock.

Today there's actually a meeting at the Department of Forestry where Ag, Forestry and Energy representatives will be meeting to discuss cellulosic ethanol opportunities here in Oregon.

In the processing of cellulosic ethanol, enzymes are employed to convert the biomass into fermentable sugars and then a microbiological fermentation process that yields ethanol and carbon dioxide.

The high cost of these enzymes needed in the fermentation process is currently one of the key barriers in making the production of cellulosic ethanol economically feasible. Advancements in technology are needed to take place before this process will appear in widespread commercial settings.

In my opinion, the greatest opportunity for Oregon agriculture is not just in producing the feed stock but also in participating in the processing and marketing of biofuels. In many areas of agriculture through cooperatives we already have the infrastructure in place to accomplish this added supply chain management.

An example of one of these farmer-owned cooperatives is Pendleton Grain Growers. PGG has invested in the equipment to take canola seed, crush it and make biodiesel. Next year some of their growers will be producing canola to sell to the cooperative, and all the members will benefit from the sale of the end product, biodiesel through profit sharing.

There are several actions that can assist a healthy Oregon biofuels industry. They include the extension of tax credits for biodiesel and renewable fuels; the enhancement of renewable fuel standard; enhanced opportunities for E-5; service station incentives to install pumps for renewable fuels; and the expansion of the energy title in the next Farm Bill.

Also the Department of Energy and the United States Department of Agriculture need to increase their outreach to agriculture producers on the current programs that are available. There are very many in the 2005 Farm Bill. However, agriculture producers don't really understand this program and the two agencies need to get on the ground to let producers know the options.

Additionally, I would like to share our support of Senate Resolution 97 that endorses the 25 by 25 vision, that 25 percent of our Nation's industry use will come from renewable sources by 2025.

As you work to assist Oregon and the Nation's farmers and ranchers in developing renewable energies, and other long-term solutions, please remember that traditional energy sources are impacting farmers' abilities to make profits. Prospecting and developing of natural gas and crude oil resources from the United States locations while using modern environmentally-friendly methods will produce significant quantities of renewable resources and help stabilize prices.

And thank you for your interest in renewable energy and holding this hearing in Oregon, and the Farm Bureau looks forward to working with you on this and other issues.

[The prepared statement of Ms. Fast follows:]

PREPARED STATEMENT OF KATIE FAST, ASSOCIATE DIRECTOR, GOVERNMENT AFFAIRS,
OREGON FARM BUREAU FEDERATION

Thank you for the opportunity to testify on behalf of the Oregon Farm Bureau Federation. Oregon agriculture prospers from the diversity of its operations and the crops they grow; this is a diversity which can be expanded through renewable energy opportunities. Biofuels are one of many renewable energy segments in which Oregon farmers and ranchers can invest. Currently, the two biofuel options that agricultural operators are most interested in are biodiesel and ethanol.

At this time, the biodiesel producing crop best suited to Oregon's growing conditions is canola. However, Oregon Department of Agriculture has rules in place that prohibit canola production in certain areas of the state, such as the Willamette Valley, due to concerns about interactions between this crop and high-value specialty seed crops. The Department will be requesting funding from the Oregon Legislature to investigate how these two industries can co-exist and research alternative oilseed crops for these regions.

Nationally in the past 2 years, the price of a gallon of diesel fuel for farm use has increased nearly \$1 per gallon or 74 percent. Due to these high energy prices, Oregon agriculture's interest in biodiesel has recently changed. Two years ago,

farmers were more interested in growing and marketing the feedstock crops for biofuels. Today, farmers are wanting to grow the feedstock crops to crush and process the seed and run homegrown fuel in their farm equipment. Many operations analyzing this opportunity would utilize all the fuel themselves and not sell the crops or fuel off the farm.

Oregon will probably never produce the levels of corn needed to support a conventional ethanol industry as the majority of ethanol plants located in Oregon will be shipping corn in from the Midwest. However, Oregon does have the potential to support a cellulosic ethanol industry. Cellulosic ethanol can be produced from a wide variety of cellulosic biomass feedstocks including agricultural plant wastes, plant wastes from industrial processes, and energy crops, such as switchgrass, grown specifically for fuel production. Our healthy agriculture and forestry industries make Oregon a prime location for a cellulosic ethanol plant. Oregon's grass and wheat straw industries combined with forest thinning on private land and the full implementation of the Healthy Forestry Act on Federal lands creates a strong base of cellulosic feedstock.

In the processing of cellulosic ethanol, enzymes are employed to convert the cellulosic biomass into fermentable sugars; a microbial fermentation process then yields ethanol and carbon dioxide. The high cost of these cellulose enzymes needed in the fermentation process is currently the key barrier to making the production of cellulosic ethanol economically feasible. Advances in technology need to take place before this process will appear in commercial settings.

In my opinion, the greatest opportunity for Oregon agriculture is not just in producing the feedstock, but also participating in the processing and marketing of biofuels. In many areas agriculture, through cooperatives, already has the infrastructure in place to accomplish this added supply chain management. An example of one of these farmer-owned cooperatives is Pendleton Grain Growers (PGG). PGG has invested in the equipment to take canola seed, crush it, and make biodiesel. Next year, some of their growers will sell canola to the cooperative, and all of the members will benefit from the sale of the end product, biodiesel, through profit sharing.

There are several Federal actions that can assist a healthy Oregon biofuels industry. They include the extension of tax credits for biodiesel and renewable fuels, enhancement of the Renewable Fuels Standard, enhanced opportunities for E-85, service station incentives to install pumps for renewable fuels and the expansion of the Energy Title of the next Farm Bill. Additionally, I would like to share our support of the Senate Resolution 97 that endorses the 25x25 Vision that 25 percent of our Nation's energy use will come from renewable sources by 2025.

As you work to assist Oregon's and the Nation's farmers and ranchers in developing renewable industries, please remember that the prices of traditional energy sources are impacting their ability to make a profit. Prospecting and developing natural gas and crude oil resources from United States locations while using modern, environmentally-friendly methods will provide a significant quantity of energy resources and help stabilize prices.

Thank you for your interest in renewable energy. The Farm Bureau looks forward to working with you on this and other issues.

Senator SMITH. I look forward to that as well, Katie. I'm so excited about having another outlet for all that we can grow on our Oregon farms.

I guess I'm just curious, say that you had a 2,000-acre farm in eastern Oregon, or western Oregon. That's a big farm in western Oregon. And you wanted to create your own diesel to run your tractors and your other operations there.

How much of that 2,000 acres would be dedicated? Let's use 1,000 acres to make it easy, how much of that 1,000 acres would go to fuel and how much to the traditional crops, for food?

Ms. FAST. Well, Senator Smith, that is part of the issues that Agriculture is trying to do a feasibility study. But I can maybe do an example for a 2,000-acre farm, because there are some farmers that I know looking at those options.

I would say they would need to put aside about 100 acres for canola production, and they wouldn't grow canola on those acres

every year. They would probably do a 1 in 4 year rotation on those 100 acres. And that should be able to utilize their on-farm use.

And that is maybe more in the Willamette Valley setting than an Eastern Oregon setting, where they're going to get a little more poundage per acre. So, in eastern Oregon, that acreage might increase. But it's probably going to vary per operation.

Senator SMITH. I imagine the Farm Bureau is trying to figure out what are the consequences of canola growing and the cross-pollination problems.

I mean, they are all your members, and how are you going to referee that fight?

Ms. FAST. It's a big challenge that we are facing. And while we see the opportunities with canola, we can't forget the other high value crops.

Senator SMITH. We still need to eat, too.

Ms. FAST. The biggest challenge with the specialty seed is its uniqueness on the areas that it can be grown. And what the trading partners will do.

A lot of the issue has to do with more perception of risk than maybe true risk. And we're working with the Department of Agriculture here in Oregon to try to assess those risks and create a program where these two industries can co-exist. And hopefully we can find alternative crops as well so we are not just looking at one crop that's an option.

Senator SMITH. I know the Midwest farmers are just really gearing up for ethanol. And that's a great thing. I mean, it's great for the rural communities in so many respects. And certainly the Energy Policy Act has all the incentives that you could need for the infrastructure for ethanol to be available to the whole country on a massive scale. And that would be very, very helpful to our energy future. I think it can be done without compromising our food future, as well. So, thank you, Katie.

Ms. FAST. Thank you.

Senator SMITH. Mike McArthur.

**STATEMENT OF HON. MIKE McARTHUR, EXECUTIVE
DIRECTOR, ASSOCIATION OF OREGON COUNTIES**

Mr. McARTHUR. I am Mike McArthur. Thank you for the opportunity to appear here this morning. I appreciate your interest in this topic.

I couldn't agree more with your opening remarks. Technically, I may be known as the former Honorable Mike McArthur. I am no longer an elected official, but I was the chief elected executive of Sherman County when Klondike 1—

Senator SMITH. You still look honorable to me, though.

Mr. McARTHUR. Thank you. I appreciate that. And currently I'm chairing the state's renewable energy work group, which is looking to implement the state's renewable energy action plan, and amongst those, the renewable fuels standards and also renewable portfolio standard.

The Governor has asked us to come up with a plan that would get us to 25 percent renewables by the year 2025. And we met here yesterday in trying to fashion that plan.

I'm also a member of the Department of Energy Sustainable Energy Loan Program Advisory Committee, which is making funds available for renewable projects around the state.

Oregon is really blessed with abundant renewable energy in the form of commercially developable regimes. We also have the advantage of transmission capacity in some places and the great advantages you heard earlier of the hydro, which is affirming ability for the intermittent renewable resources that are available.

We have the opportunity for commercial size wind projects that you're seeing now being constructed throughout the Mid-Columbia, in your neighborhood, and mine, from 50 megawatts up to as large as 450 megawatts. Some of the largest in the world. We also have the opportunity for community-based wind projects that are locally-owned by private individuals, land owners, or partnerships, with local communities and counties.

These projects generally range in size up to about 10 megawatts. I want to emphasize these two types of projects are very compatible. In fact one can't exist without the other, because of transmission constraints.

Oregon is seeing wind development in diverse areas of the state, the Mid-Columbia, as I mentioned, very dramatic growth there in commercial wind farms, Klondike and Condon wind farms are currently online with 150 megawatts. There is expansion in Sherman County, Gilliam, Wasco, and Morrow County.

And BPA is working with these wind developers to provide the new transmission access to their 500 kV lines that run east and west along the Columbia River Gorge. It is anticipated there are another 1,900 to 2,500 megawatts in the next 5 years that may come online in that area.

I know that in Sherman County there are approximately 500 megawatts either in the planning stages or going through the siting process, which if fully implemented and generating, will approximate the output of the John Day Dam.

To put that in perspective, there are 66 1.5-megawatt turbines there now generating; at capacity, 100 megawatts. One of those turbines would generate at capacity nearly enough electricity to power all the residential load in Sherman County. So, that needs to move somewhere.

For this next step to happen, the only way that you're going to get transmission out of Sherman County is to tap into the 500 kV line at the John Day substation, and in order to do that, you have to have the transmission from the site to the substation, and you heard the million dollars a mile for 230 volt lines. The substation itself may cost well above \$420 million to jump the power from 230 to 500. And one of those transformers costs \$14 million, and you have to have a spare.

So, you see, it takes a large scale commercial operation to amortize those costs in order to be able to put that transmission infrastructure there. But once there, that creates the opportunity for smaller projects that may be geographically not feasible for a large commercial site, which could be locally-owned, which would bring on additional economic advantage to the farmers themselves.

Because the lease the farmers receive now is fairly modern, you're not going to live on the lease off the wind farm unless you

have a very large block of land. But it does create the opportunity for investors to get into this locally.

There are also other projects going on in Oregon: Stateline, VanCycle, and Combine Hills. And there is a new project now in Union County being built by Horizon, a 100-megawatt project in Union County coming forward.

Southern Oregon has a number of projects in the planning stage: Lake, Harney and Klamath counties. There's also a lot of opportunity on the coast because of the winds there.

Oregon's renewable energy work group, as I said, is crafting legislation for the next legislative session that will introduce this renewable portfolio standard of 25 percent by 2025. The RPS will likely be a hybrid type, with the majority likely going to large-scale wind projects, because that is the cheapest way to get there. It would be based on competitive bids.

A significant portion, we hope, may go to these locally-based renewable projects. The trick of it is how to do that and still stay within the economics of not driving up rates for the consumers.

There are a number of factors that we were considering at work group. Issues like: Who should the portfolio standard apply to; what type of utilities; what should be the targets for when certain levels of percentage should be achieved by; what type of renewable should qualify; should there be cost gaps, and what should they be? And what about the penalties, and how do you structure a penalty regime if you don't get there; and what's the timeline for implementation?

A number of Oregon communities are conducting resource assessments to identify potentially locally owned projects in their areas. These smaller projects can use smaller transmission systems than those needed by larger commercial projects and allow for smaller projects in areas not available but to the big projects. Their advantage is that the revenues from these projects remain local, and provide energy self-sufficiency and economic development in rural areas that cannot benefit from the larger wind projects.

Oregon is developing a support system to allow for growth of the rural energy projects, one of the best in the Nation. Our business energy tax credit, which you heard about, the sustainable energy loan program, which is funded by general obligation bonds issued by the state. The economic development funds that now exist to do feasibility studies to determine if projects get eligible for these other funds.

And then, of course, we have the public purpose charges through the energy trust, are reinvested in the renewable energy projects.

Federal programs. Oregon is putting in place a number of state programs to facilitate renewable energy projects. The needs of Oregon are changing and becoming more sophisticated as our renewable energy vision matures.

Our Federal needs are becoming better defined, and I will give you examples of how it appears. You have heard so much about the production tax credit, and we really appreciate your support in keeping that going. The length of that extension is the real issue in the predictability of that, as you know.

I really think that it has had an effect on the availability of turbines. There was one project, community project in Sherman Coun-

ty, that could not go forward because there wasn't a turbine available. And I think that's directly related to the uncertainty of the production tax credit. That is the interest in putting a manufacturing plant in Portland a few years ago. I think it was put on hold because of the uncertainty.

So, in order to really capitalize on the economic development advantages, we need to have turbine manufacturers in the United States or in the Northwest, if we could, and we need to have a longer PTC extension to attract that kind of investment. And also keep the turbines affordable, because the start-and-stop cycle makes it uncertain for the manufacturers.

The price of turbines has increased significantly in the last couple of years, and has affected the economics of certain projects.

We need to create a community sized category in the Energy Bill to recognize the unique needs of smaller, locally-owned projects, up to 12 to 20 megawatts.

At present the PTC language works well for commercial scaled projects, but actually is an impediment for the smaller projects. I think as you heard earlier, that some of the smaller developers don't have the tax appetite that is necessary for a production tax credit, so they have to sell those so then the whole project goes to the investor who has the tax appetite.

A separate category in the Energy Bill would allow for specialized policies aimed at locally owned small projects.

There are a couple of Federal measures being considered now, S. 2571 and H.R. 4716, which would create a 30 percent tax credit for the purchase of small wind systems used to power homes, farms and businesses. The small windtax credit is one component of S. 2571 and a wide ranging energy policy bill that was sponsored by Senator Conrad. H.R. 4716, sponsored by Representative Cole, is focused exclusively on small wind tax credits. So, I hope that you will give those some consideration.

Also there has been some talk about considering a Federal RPS. Nineteen states now have them, and it might be interesting to see the consistency.

We encourage an Oregon workshop to be comprised of knowledgeable stakeholders to define a new vision for renewable energy at the Federal level that speaks to the evolving needs of Oregon as it moves forward to become more energy self-sufficient, in these difficult energy times we face.

In my testimony there's a map that's included that shows some of the projects that are going on around the state right now, particularly on the community side, the smaller projects, studies, and actual projects going into the ground.

That concludes my testimony, Senator. I would be happy to answer questions.

[The prepared statement of Mr. McArthur follows:]

PREPARED STATEMENT OF HON. MIKE MCARTHUR, EXECUTIVE DIRECTOR,
ASSOCIATION OF OREGON COUNTIES

Oregon Renewable Wind Energy

Oregon is blessed with abundant renewable energy in the form of commercially developable wind regimes. These wind regimes are allowing the creation of several types of wind projects:

- *Commercial-sized* wind projects with power for sale to Northwest Utilities—these projects range from 50 MW up to as large as 450 MW.
- *Community-based* wind projects that are locally owned by private landowners or partnerships with local communities, counties, etc.—these projects range in size up to 10 MW. Oregon is seeing wind development in diverse areas in the state.
- *Mid-Columbia*—this area is undergoing dramatic growth in commercial wind farms. Klondike and Condon are currently online with 150 MW with expansions planned in Sherman County, Gilliam, Wasco and Morrow Counties. BPA is working with developers to provide new transmission access into their 500 kV transmission systems with an anticipated additional 1,900–2,500 MW in the next 5 years.
- North-Eastern Oregon has Stateline, VanCycle, and Combine Hills plus a proposed 100 MW project in La Grand with Horizon.
- Southern Oregon has a number of projects in the planning stage in Lake, Harney, and Klamath counties.

The Oregon Renewable Energy Work Group is crafting legislation for the next legislative session in 2007 to introduce a Renewable Portfolio Standard (RPS) of 25 percent Renewables by 2025. The RPS will probably be a hybrid type with the majority likely going to large-scale wind projects on competitive bids while a significant portion may be going to locally owned Community Based Renewable Energy projects.

A number of Oregon communities are conducting resource assessments to identify potential locally owned projects in their areas. These smaller projects can use smaller transmission systems than those needed by larger commercial projects and allow for smaller projects in areas not available to the bigger wind projects. Their advantage is that the revenues from these projects remain local and they provide energy self sufficiency and economic development in rural areas that can not benefit from the larger commercial wind projects.

Oregon is developing support programs to allow for growth of renewable energy projects:

- State tax incentives in the form of *Business Energy Tax Credits* (BETC) which allow for tradable state tax credits similar but more flexible than Federal Production Tax Credits (PTC).
- Low interest *Sustainable Energy Loan Program* to provide financing for qualifying projects.
- Economic Development funds to assist communities in early feasibility studies.

Federal Programs

Oregon is putting in place a number of state programs to facilitate Renewable Energy Projects. The needs of Oregon are changing and becoming more sophisticated as our Renewable Energy vision matures. Our Federal needs are becoming better defined and can be articulated to a few simple issues:

1. *Extend Production Tax Credits (PTC) for 10 years*—the current on-again/off-again two-year funding of PTC's has crippled Oregon's ability to buy wind turbines for community projects and is seriously hampering commercial wind development. Turbine manufacturers have left the U.S. and the few remaining are sold out for years in advance to a few large developers. We must have longer PTC extensions to attract turbine manufacturers to locate and build enough turbines to meet demand.

2. *Create a "COMMUNITY SIZED" category in the energy bill to recognize the unique needs of smaller locally owned projects up to 20 MW.* At present, the PTC language works well for commercial scale projects but is actually an impediment to smaller locally owned projects. A separate category would allow for specialized policies aimed at locally owned smaller projects.

3. *Support S. 2571 and H.R. 4716*, both of which would create a new 30 percent tax credit for the purchase of small wind systems used to power homes, farms, and small businesses. The small wind tax credit is one component of S. 2571, a wide-ranging energy policy bill sponsored by Senator Kent Conrad (D-ND). Meanwhile, H.R. 4716, sponsored by Representative Tom Cole (R-Okla.), is focused exclusively on the small wind tax credit.

We encourage an Oregon workshop comprised of knowledgeable stakeholders to define a new vision for Renewable Energy at a Federal level that speaks to the

And Washington is headed in the same direction with the initiative that may be passed—

Senator SMITH. Washington is as well.

Mr. MCARTHUR. So we may be subject to other out-of-state interests looking to purchase our power resources.

Senator SMITH. Well, that may be what it takes to get those kinds of resources in there. I don't know. But if we're all pushing our portfolio standards up, it will take money. It eventually gets paid for by ratepayers. But if we get enough volume, the volume will drive down the end price.

Mr. MCARTHUR. Long-term, it may stabilize the price.

Senator SMITH. I don't like the way the price has been going with the status quo. It is going up. Thank you, Mike.

Senator SMITH. Bill Carlson.

**STATEMENT OF WILLIAM CARLSON, CHAIRMAN,
USA BIOMASS POWER PRODUCERS ALLIANCE**

Mr. CARLSON. Thank you, Mr. Chairman. I am speaking today as Chairman of the U.S. Biomass Power Producers Alliance. The Alliance and its Oregon members and partners appreciate the opportunity to testify on the emergence of renewable energy and associated economic development opportunities in Oregon and elsewhere.

We are a trade organization representing the interests of approximately two-thirds of the Nation's open loop biomass facilities.

We thank you and the Senate for adding, in both the jobs and energy bills, open loop biomass to the list of renewable technologies qualifying for the Federal Section 45 production tax credit.

This action, coupled with rising fossil prices and strong state renewable programs have produced a resurgence of interest in biomass power not seen since the mid-1980s. Previously the trend had been opposite, with over 30 percent of the country's biomass facilities closing since the 1990s, including several in Oregon.

Here, activity has been especially frenzied with nearly 15 proposals for new or reopened plants with a combined capacity in excess of 150 megawatts.

Oregon has a good combination of programs for renewable power, some of which Mike described, that includes reasonable fossil-based avoided cost, 20-year contracts, and developer retention of the green tags.

The state business energy tax credit of 35 percent of project capital cost, and a grant program administered by the Energy Trust of Oregon for projects selling their output to investor-owned utilities, coupled with the first ever availability of the Federal tax credit, have made Oregon a hot bed of biomass power activity.

The typical proposal in Oregon is for a 5–10 Megawatt plant located at an existing sawmill or plywood plant. These locations provide a source of internal mill waste, a steam customer and an existing infrastructure.

Proposed projects are in rural Oregon communities such as: Cave Junction, Lakeview, Tillamook, Roseburg and the Warm Springs Reservation, as you heard, communities that have been hard hit by the dismantling of much of the forest products infrastructure.

Capitalization of an individual project is typically \$12 to \$25 million. That would be the largest private investment in these communities in many years, providing property taxes, jobs and hope.

Activity is being truncated, however, by the impending expiration of the tax credit, as you have heard more than once this morning, which requires projects to be placed in service by the end of 2007.

Only three of these projects are likely to meet this deadline. All others will be shelved, awaiting extension of the tax credit as a project not already contracted for cannot be completed in time.

Biomass offers many benefits beyond displacement of fossil power generation common to all renewables. Beyond rural economic development, biomass power delivers capacity and energy reliability on demand, and is used to offset the purchasing utilities' need for new power generation.

Biomass power facilities eliminate 96 percent of air pollution from open burning. Biomass power generation lowers greenhouse gas emissions below the zero net carbon emissions common to all renewables by lowering methane emissions from wood decomposing in the woods or landfills or burning uncontrolled, replacing it with much less damaging carbon dioxide.

Oregon forests need a massive thinning effort to reduce the build-up of brush and small trees from 100 years of fire exclusion. A network of biomass power facilities is critical to this effort, since 50 percent or more of the thinned material is not suitable for forest products.

Senator SMITH. 50 percent?

Mr. CARLSON. As a minimum. Typically in the 50 to 60 percent range, it is simply a fuel value, and the remainder can potentially be used for forest products.

The combination of thinning to produce small saw logs and fuel is far more economic and environmentally positive than thinning with subsequent open burning of the thinned material.

Scarce Federal dollars can treat far more acres and more quickly return health and fire resistance to the forest. The forest products industry in Oregon can be rebuilt on the basis of a steady long-term supply of small saw logs, with steady and long-term being prerequisites to obtaining capital for new mills or power plants. Projects utilizing forest thinning material requires a stronger set of incentives and would benefit dramatically from an equalization of the production tax credit among all renewables and by the funding of Section 210 of the Energy Bill, which established a grant program to aid with transporting of fuels from forest thinnings.

Currently, open loop biomass power qualifies for only one-half of the credit of wind or geothermal power. Congress should remedy this inequity when it considers an extension to the tax credit, as was recommended to you by the Western Governor's Association.

A level playing field among renewables is needed since many states fill needs for renewable capacity via open auctions. Biomass bids are typically not accepted by utilities as they are underbid by those who qualify for the full Federal credit. Often as much as 95 percent of all new capacity is wind and geothermal. Again we ask that this inequity be eliminated when the federal production tax credit is renewed.

In summary, biomass power has seen a resurgence in Oregon and elsewhere due to the combination of the federal tax credit and strong state programs. A few mill residual projects will be completed by December 31, 2007, but many more are being shelved, awaiting an extension of the credit by Congress.

Future biomass projects require at least that the tax credit be brought up to the level of equity with others. Several hundred megawatts of beneficial biomass power facilities in Oregon would strengthen and expand rural economies and forest products industries, make a large contribution to the greenhouse gas emissions in the state, and help restore Oregon's forests to health and fire resistance. Large-scale delivery of these benefits awaits the extension and equalization by Congress of the tax credit. Thank you.

[The prepared statement of Mr. Carlson follows:]

PREPARED STATEMENT OF WILLIAM CARLSON, CHAIRMAN,
USA BIOMASS POWER PRODUCERS ALLIANCE

Chairman Smith and members of the Subcommittee:

The USA Biomass Power Producers Alliance (USABPPA) and its Oregon members and partners greatly appreciate the opportunity to present testimony on the emergence of renewable energy and the associated economic development opportunities in Oregon, the Pacific Northwest and the United States. The USABPPA is a trade organization, representing the interests of approximately two-thirds of the Nation's total of about 100 operating open loop biomass power facilities.

We first wish to thank the Senate and Congress for adding, first in the 2004 JOBS bill and then again in the 2005 Energy bill, open loop biomass to the list of renewable technologies qualifying for the Federal Section 45 Production Tax Credit, albeit at only half the rate available to some other technologies. This action, coupled with rising fossil prices and similar state renewable programs, have produced a resurgence of interest in biomass power not seen since the mid-1980's. Prior to this action, the trend had been in the opposite direction, with over 30 percent of all biomass power facilities across the United States having closed since the 1980s, including several in Oregon.

In Oregon, activity has been especially frenzied, with nearly 15 proposals for new or reopened plants being developed, with a combined capacity in excess of 150 megawatts. Oregon has a good combination of programs for renewable power that includes:

1. Establishment by the Oregon Public Utilities Commission (OPUC) of reasonable utility fossil based avoided costs available in contracts as long as 20 years.
2. A State Business Energy Tax Credit (BETC) of 35 percent of project capital cost, deductible over 5 years.
3. A grant program administered by the Energy Trust of Oregon for projects selling their output to either PacifiCorp or Portland General Electric.
4. A ruling by the OPUC that projects selling at the utility's avoided cost retain their "green tags" for potential sale to others.

The above programs and rulings, coupled with the first ever availability of the Federal Section 45 Production Tax Credit, have made Oregon a hotbed of biomass power activity.

The typical biomass power proposal in Oregon is for a 5-10 megawatt power plant located at an existing sawmill or plywood plant. These locations provide a source of reasonably priced mill waste (bark, sawdust, shavings), a steam customer in the form of lumber dry kilns or veneer dryers and an existing infrastructure to support the development. These proposals piece the above circumstances together with various state and Federal programs to create an economically viable project. Each piece of the puzzle is important.

Almost exclusively, these proposed projects are located in rural Oregon communities such as: Cave Junction, Lakeview, Tillamook, Roseburg and the Warm Springs Reservation; communities that have been economically hard hit by the dismantling of much of the forest products infrastructure in Oregon over the last 15 years. Though the total capitalization of an individual project may total only \$12-

25 million, it would be the largest private investment in these communities in many years, providing much needed property taxes, jobs and hope.

The model described above is about to be truncated, however, by the impending expiration of the Federal tax credit, which requires projects to be placed in service prior to the end of 2007. At this time, it appears that only projects at Rough & Ready Lumber in Cave Junction, Douglas County Lumber in Roseburg and Freres Lumber in Lyons will meet this deadline, at least partly because each was able to find a used turbine-generator matching its requirements. All others will likely be placed on the shelf, awaiting extension of the Federal production tax credit by Congress as, with only 16½ months remaining in the tax credit qualification period, a project not already contracted for cannot be completed in time.

This is truly a shame, as biomass, among renewables, offers many societal and environmental benefits beyond the mere displacement of fossil fuel power generation that all renewable technologies offer. The rural economic development potential was described above. Second, biomass power delivers capacity and energy reliably on demand, and thus can be used to offset the purchasing utility's need for new power generation, something several renewable technologies cannot offer.

In addition, fueling of biomass power facilities can contribute to the elimination of air pollution from open burning, prescribed fires or forest fires. Utilization of urban wood waste can reduce the demand for scarce landfill space. Biomass power generation has the potential to lower greenhouse gas emissions below the zero net carbon emissions common to all renewable technologies, and further lower existing methane emissions from wood decomposing in the woods or landfills, or burning in uncontrolled prescribed or forest fires, replacing these methane emissions with much less damaging carbon dioxide.

Oregon forests, particularly those east of the crest of the Cascades and in Southern Oregon, need a massive thinning effort to reverse the build up of brush and small trees that have resulted from 100 years of fire exclusion. The existence of a network of biomass power facilities is critical to this effort, as typically 50 percent or more of the thinned material is not suitable for traditional forest products, but all is suitable for fuel. The combination of thinning to produce small sawlogs and biomass fuel is far more economic and environmentally preferable than thinning with subsequent open burning of the thinned material as is commonly done in Oregon. Scarce Federal dollars can thus treat far more acres with the result that the forest is more quickly returned to health and rendered more fire resistant. At the same time, the forest products industry in Oregon can be rebuilt on the basis of a steady long-term supply of small sawlogs. The "steady" and "long-term" phases are prerequisites in any Federal thinning program before large scale capital for new mills or power plants can be obtained.

The types of biomass power projects utilizing forest thinning material unfortunately require a stronger set of power contract pricing and incentives than do the mill waste projects described earlier, and all such project proposals in Oregon and elsewhere in the West are currently stalled. These projects would benefit dramatically from an equalization of the Federal production tax credit among all renewables, and by the funding of Section 210 of the 2005 Energy Bill, which established a grant program to assist with the cost of transporting fuel from forest thinning activities. Currently, open loop biomass power qualifies for only ½ the credit of wind or geothermal power. We would request that Congress address and remedy this inequity when it considers an extension to the Section 45 Production Tax Credit. This was the Number 1 recommendation of the Western Governor's Association Biomass Task Force.

A second strong reason to create a level playing field among renewables with regards to the tax credit is that many states, including some Pacific Northwest states, fill needs for renewable capacity via auctions. This method of adding new renewable capacity has been judged by the Federal Energy Regulatory Commission (FERC) as an acceptable means of implementing PURPA. For biomass power, it means that their bids are typically not accepted by utilities as they are underbid by wind and geothermal producers who qualify for the full Federal credit. In some states, as much as 95 percent of all new capacity is in wind and geothermal. Again, we ask that this inequity be eliminated when the Federal production tax credit is renewed.

In summary, biomass power has seen a resurgence in Oregon, and elsewhere in the United States, due to a combination of a newly expanded federal tax credit, strong Oregon state programs and wise rulings by the OPUC. A few mill waste based projects are proceeding prior to the 12/31/07 expiration of the tax credit, but many more are being shelved, awaiting an extension of the credit by Congress. Projects based on forest thinning residuals require at least that the tax credit be brought up to the level of equity with wind and geothermal projects.

Utilized to its full beneficial extent in Oregon, biomass power facilities could approach 1,000 MW of capacity, and in the process, strengthen and expand rural economies including rural forest products industries, lower criteria air emissions, make a large contribution to lowering greenhouse gas emissions in the state, displace imported fossil fuel and increase energy security, and help restore Oregon's incredible forests to health and fire resistance. Delivery of these benefits on a large scale awaits the extension by Congress of the Section 45 Production Tax Credit and the equalization of the credit among renewable technologies.

The USA Biomass Power Producers Alliance and its Oregon members and partners appreciate the opportunity to testify at this hearing.

Senator SMITH. Thank you very much, Bill. You have some great ideas. We have noted them, and we will do our level best to get the equalization included in the extension of the tax credit.

Do you think that the Oregon forest industry looks at biomass fuels as a future component to their own viability?

Mr. CARLSON. Certainly the solid wood producers see it that way. That they have to get more value out of their residual materials.

I mean, historically, chips has been the one material that they've had, and it has had substantial value above its transportation cost.

Senator SMITH. For pressboard and things like that?

Mr. CARLSON. Yes. And for paper primarily. And some of the others have fluctuated with the availability and demand for the other products, such as particle board. But certainly they see it as a major component.

Senator SMITH. As you see biomass as a category among the renewables, where do you think its future is relative to the others? Is it the elephant in the room, comparatively, or—

Mr. CARLSON. No. The Western Governors Association Biomass Task Force estimated that there may be as many as 10,000 megawatts of biomass in the west that could be developed at a cost of about 8 cents per kilowatt hour, without incentives.

Senator SMITH. We're not going to run out of biomass either.

Mr. CARLSON. Oh, no. The Federal Government did what they call, "the billion ton study," because some of the projections of 25 or 30 percent of the Nation's energy from biomass, say, by the year 2050 would require a billion tons a year of material, which is a lot of material obviously, and they estimated that on a sustainable basis, the Nation's supply could be as much as 1.3 billion tons per year, using actually very conservative assumptions when it came to the forestry side.

Senator SMITH. So it is entirely renewable.

Mr. CARLSON. Yes.

Senator SMITH. That's very helpful. Thank you very much, Bill.

Senator SMITH. Bob Maynard.

STATEMENT OF BOB MAYNARD, OWNER, ENERGY OUTFITTERS; BOARD MEMBER, GOVERNMENT POLICY CHAIR, OREGON SOLAR ENERGY INDUSTRIES ASSOCIATION (OSEIA)

Mr. MAYNARD. Thank you, Senator Smith—

Senator SMITH. You're the one with the answer to my earlier question.

Mr. MAYNARD. Thank you. Thanks very much for this opportunity to testify today.

My name is Bob Maynard and I am the Owner of Energy Outfitters, a solar electric distribution company based in Grants Pass

and a Board Member of the Oregon Solar Energy Industries Association.

We would also like to thank you for introducing S. 2677, The Securing America's Energy Independence Act. This Act will extend the renewable energy tax credits for 8 years and expand the residential credit to \$2,000 per kilowatt.

Solar energy companies need these long-term commitments in order to raise the capital, build the new facilities, and create the jobs and expand the markets. With these signals, the industry will attract investment and deliver jobs to communities throughout Oregon and the Northwest. Jobs in manufacturing, distribution, installation and service.

Energy from the sun is adding valuable assets to our energy portfolio in the form of electricity, commercial and domestic hot water, active and passive heating and cooling.

Globally, solar energy markets are expanding rapidly and the United States has fallen behind. Without strong leadership and focus on the long-term, the United States will continue to lose ground to other highly competitive countries.

We face the proposition of replacing our current energy imports with future imports of solar energy technology and products. America's window of opportunity is still open if we take a decisive action. We once led the world with solar energy innovation.

Silicon-based solar cells originated in the United States by inventors with close ties to Oregon. We have an extraordinary record of achievement in high-tech sectors and innovation, and solar energy hold enormous potential if we just restore the commitment to it.

The current tax credits are a good start, but will not encourage the investment in domestic manufacturing because they are too short in duration.

S. 2677 addresses this problem with longer vision and yet another obstacle remains. Many businesses have gone through the process of evaluating solar energy investments only to find the alternative minimum tax prevents them from using the tax credit. Exempting the solar energy tax credit from the AMT will improve the conditions needed for the installations of commercial systems and it's an important part of S. 2677.

From global experience we know that the successful long-term programs are fueling one of the newest and fastest growing industries in the world, solar energy. Distribution companies like mine, Energy Outfitters located in Grants Pass, are expanding and growing with this industry.

Founded in 1999 as a retail store in Cave Junction, today we operate three distribution facilities, supplying approximately 300 solar contractors throughout the United States and Canada. Eighty-five percent of our sales come from outside of Oregon. Our revenues have grown 500 percent in the last 5 years. And we currently employ about 25 people.

We are developing our own line of complimentary products and will be expanding our production facility in Grants Pass.

To round out this business portfolio, we have been investing in building in our commercial and industry installation division in Oregon.

PV Powered, a manufacturer near Bend, is designing and manufacturing invertors, the power electronics required for solar electric systems. Most of their products are exported out of state, bringing more dollars home to Oregon.

REC in Moses Lake, Washington, the world's largest producer of solar grade silicon, is committed to an additional \$600 million expansion of their Northwest facility.

The rapidly growing solar industry is also creating growth opportunities for glass manufacturers, aluminum extruders, makers of specialty coatings, metal fabricators, and machine manufacturers.

Many diverse Oregon businesses will benefit from this. A steel fabrication in Roseburg that once had no relation to solar energy now generates a significant portion of their business from manufacturing support structures for solar tracking systems. Solar energy provides several valuable assets to the energy portfolio, including electricity and hot water.

The largest contribution to our energy needs from solar is the production of hot water. It's far more effective to transfer the heat of the sun directly to hot water than it is to burn valuable gas and electricity.

Solar electric systems generate their peak performance when electric demands are high and have very predictable performance. We know this from years of research performed right here in Eugene by the University of Oregon solar radiation monitoring lab. They have compiled one of the largest continuous records of solar data available today. This data accurately allows us to forecast the performance for years to come. Today's solar electric panels typically have power output warranties of 25 years and an estimated life expectancy of 40+ years.

Senator SMITH. With very little maintenance?

Mr. MAYNARD. With virtually no maintenance. Solar's long-term reliability, predictability, and performance, reduces the cost and the risk associated with volatile future fuel supplies.

Because solar is typically a distributed generation technology, expensive transmission line upgrades are avoided, prolonging the useful life of our existing investment in the grid.

Oregon has supported solar energy systems with tax credits for over 20 years, and today is the leader in the number of installed systems in the Northwest.

With a long-term and significant commitment from the Federal Government with the efforts like S. 2677, and the Solar America Initiative, we can regain the global leadership position we once held with solar energy.

We applaud your efforts and the support of all the renewable energy technologies, and we encourage you to continue to lead our Nation to a stable, clean energy future.

This concludes my testimony. Thank you for the opportunity.

[The prepared statement of Mr. Maynard follows:]

PREPARED STATEMENT OF BOB MAYNARD, OWNER, ENERGY OUTFITTERS; BOARD MEMBER, GOVERNMENT POLICY CHAIR, OREGON SOLAR ENERGY INDUSTRIES ASSOCIATION (OSEIA)

Thank you, Senator Smith and members of the Committee, for giving me the opportunity to testify today. My name is Bob Maynard, and I am Owner of Energy

Outfitters, a solar distribution company based in Grants Pass, Oregon and a Board Member of the Oregon Solar Energy Industries Association (OSEIA).

I would also like to thank Senator Smith for introducing S. 2677, The Securing America's Energy Independence Act. This Act will extend the renewable energy tax credits for 8 years and expand the residential credit to \$2,000 per kilowatt.

These long-term commitments are the correct signals we need to stimulate growth in America's renewable energy companies. With these signals, the renewable energy industry can attract investment and deliver jobs in communities throughout Oregon and the Northwest—jobs in manufacturing, distribution, integration, installation, and service.

Renewables like solar will play a significant role in our clean energy future. In our local communities, both rural and urban, energy from the sun can add valuable assets to our energy portfolio including electricity, commercial and domestic hot water, and active and passive heating and cooling. Solar is not “the only answer” to our energy problems, but it will be a significant part of the solution. Solar, along with other renewables, will be a significant contributor to our energy portfolio, our job base, our economy, and our clean energy future.

What the Renewable Energy Industry Needs

Renewable energy companies need long-term commitments in order to raise capital, build new facilities, create jobs, and expand markets. In countries and states that have done this, renewable energy has thrived, producing jobs, economic opportunities, and clean energy.

The early vision and long-term programs in Germany and Japan are now beginning to show a significant return. As interest and private investment pours into renewable energy manufacturing and infrastructure, these countries top the list in growth and profitability in this industry. They have successfully demonstrated the critical role that government must play to spur growth, leading to sustainable markets with diminishing support.

Globally, renewable energy markets are expanding rapidly and the United States has fallen behind. Without strong leadership and focus on the long term, the United States will continue to lose ground to other highly competitive countries. Without a serious and sustained effort, we will not be competitive in the renewable energy industry. We face the proposition of replacing current energy imports with future imports of renewable energy technology and products designed and manufactured abroad.

It doesn't have to be this way—a window of opportunity is still open. If we want these economic opportunities in Oregon, the Northwest, and America, now is the time to take decisive action.

The United States once led the world with renewable energy innovation. Silicon-based photovoltaic cells were invented in the U.S. and the inventors had close ties to Oregon. We have an extraordinary record of achievement in high-tech sectors and innovation in America and renewable energy holds limitless potential, if we just restore our commitment to it.

Businesses are highly motivated to succeed in solar and other renewable energy ventures and are rising to the challenge. Wall Street is beginning to take notice. More solar companies are going public and the early results look very good. The average gain for U.S. solar stocks was 134 percent in 2005.

The current tax credits are a good start but will not encourage investment in domestic manufacturing. They are too short in duration. Senate bill S. 2677 addresses the problem with a longer vision but obstacles still remain.

Larger commercial solar systems are important because they produce more clean electricity and attract investment from out of state. However, many businesses have gone through the initial process of evaluating solar energy investments only to find the Alternative Minimum Tax (AMT) prevents them from using the federal renewable energy tax credit. Exempting the renewable energy tax credit from the AMT is crucial if installations of commercial systems are to go forward in any significant volume.

Other Federal programs such as the Solar America Initiative which provides crucial funding for technology improvement and acceptance are important early steps to keep the United States competitive. The Northwest will benefit from this initiative. We urge you to support this program and work to expand it next year.

What the Renewable Energy Industry Will Deliver

With long-term commitments, America's solar companies will continue to leverage the creativity and innovation that is currently fueling one of the fastest growing industries in the world.

We will deliver jobs in communities throughout Oregon and the Northwest—jobs in manufacturing, distribution, integration, installation, and service.

Installation companies are starting up in communities throughout Oregon. These small businesses, along with all other Oregon small businesses, form the backbone of our economy.

Distribution companies like my company, Energy Outfitters, headquartered in Grants Pass, are expanding and growing with the solar industry. Founded in 1991 as a tiny retail renewable energy store in Cave Junction, today we operate three solar electric distribution facilities, supplying approximately 300 contractors in the U.S. and Canada. Eighty-five percent of our sales come from outside Oregon. Our revenues have grown 500 percent in 5 years and we employ approximately 25 people. We are developing our own line of complementary products and will be expanding our production facility in Grants Pass. To round out our business portfolio, we have been investing in and building our commercial and industrial installation division in Oregon that will create and support many well paid jobs deploying renewable energy systems.

Oregon manufacturers such as PV Powered in Bend are designing and manufacturing inverters, the power electronics portion of solar electric systems. The vast majority of PV Powered products are exported out of state bringing dollars home to Oregon.

Other Northwest manufacturers such as REC Solar Grade Silicon in Moses Lake Washington are bringing investments into the Northwest. Solar Grade Silicon has recently committed to an additional \$600 million expansion of their facility which is already the largest producer of solar grade silicon in the world.

The rapidly growing solar industry is also creating opportunities outside traditional solar companies. Glass manufacturers, aluminum extruders, makers of specialty coatings, metal fabricators, and machine manufacturers are all seeing growth as a result of the solar industry. A recent study from the Renewable Energy Policy Project (REPP) placed Oregon in ninth place nationally to receive over \$900 million by 2015 in investments attributed to the parts and pieces needed to manufacture solar electric systems. Oregon manufacturers from semiconductor, sheet metal, test equipment, and plastics industries will reap the benefits of expanded production and profits from the increased need for their products due to the growth in the solar industry.

A steel fabrication company in Roseburg, Oregon that once had no relation to solar now generates significant business from manufacturing support structures for solar tracking systems.

With the right signals the solar industry can and will deliver jobs, economic opportunities and some of the cleanest energy on earth at the most critical time—during peak load hours.

What Solar Energy Has To Offer

Solar energy provides several valuable assets to our energy portfolio including electricity, commercial and domestic hot water, and active and passive heating and cooling.

Solar energy's largest contribution to our energy needs is producing hot water. It's far more effective to transfer heat from our sun directly to water than burning valuable gas or electricity. The faster we can deploy solar water heating devices throughout America, the quicker we will free up present natural gas and electricity supplies and infrastructure for more important uses.

Solar electric systems generate at their peak performance when electricity demands are high. These systems offset energy at critical times of heavy use and will continue to do so reliably over time. We know this from many years of research performed by the University of Oregon Solar Radiation Monitoring Laboratory. They have compiled one of the longest records of solar data available and we now know what to expect this year, next year, and five, ten, and more years down the road from our solar energy systems. Solar electric panels manufactured today have power output warranties of typically 25 years and an estimated life expectancy of 40+ years.

This long-term reliability underscores another important contribution from solar and other renewable energy resources: long-term predictable stability that reduces cost and risk associated with volatile future fuel supplies.

Yet another valuable asset from renewable energy is the distributed nature of the power generation. These systems can be strategically located on the grid to prevent bottlenecks that occur and reduce the grid pressure points at critical times effectively offsetting investment in expanded infrastructure. With solar electricity, the power is being generated at the point of use. With solar thermal, the reduction in demand eases the load on existing pipelines and wires.

Conclusion

Solar energy systems have been reliably producing hot water and clean electricity, for decades in the Northwest, and Oregon is the leader in number of installed systems. This is not an accident. Oregon has supported renewable energy systems with tax credits for over 20 years.

With long-term and significant commitment from the Federal Government with efforts like S. 2677 and Solar America Initiative we can regain the global leadership position we once held with renewable energy. We applaud your efforts and support of renewable energy and encourage you to continue to lead our Nation to a stable clean energy future.

This concludes my testimony. Thank you for the opportunity to testify.

Senator SMITH. That's wonderful testimony, Bob. For my own edification and perhaps others here, where does solar come in in terms of cost compared to other renewables, or current energy sources?

Mr. MAYNARD. Right now, with no incentives, solar is probably one of the most expensive; it's probably up there somewhere near the potential that wave generation may have.

Senator SMITH. Like what is it, 30 cents?

Mr. MAYNARD. Somewhere between 20 and 25 cents per kilowatt hour. With current incentives—

Senator SMITH. When you come to that number, do you include the need for no maintenance and the life of—

Mr. MAYNARD.—some of that is figured into it, but so much of that is obscure and not recognized by true financial people that sit down and analyze it. We try not to portray that as too strong of a picture.

Senator SMITH. But there are real cost savings, if you bring that number down.

Mr. MAYNARD. That's correct. And again the distributed nature is really the beauty of it. Solar electric systems deployed upon residential roof tops throughout America can be looked at almost less as energy generation, in the big scope of things, and more as energy efficiency.

And I'll use my home in Grants Pass as an example. Two-and-a-half years ago I put a little 3 kW system on it, got a \$25,000 investment. I saw no return coming in the future for that investment for me personally. The incentive package that I was able to take advantage of through the energy trust of Oregon and through the state tax credits, significantly reduced my out-of-pocket, but it still left me somewhere at about a 20 year payback.

Does that make financial sense, just looking at it that way? Probably not.

But I had an interesting event occur last fall that changed that whole picture for me. My wife and I were looking to refinance the home. Got to get an appraisal on the home. We kind of looked around our neighborhood and said, "we're the only house in this neighborhood this funny looking, we're probably going to lose value on our home." We didn't influence the appraiser. We gave him no information.

When the appraisal came in, he gave me a \$10,000 increase in the value of my home.

So, if I look at my out-of-pocket expense as just another home improvement, at two-and-a-half years, this investment broke even.

Senator SMITH. Isn't it also true that new solar panels are being made more attractively? I mean, I've heard them described as screen doors on your roof, but that isn't necessarily true any more, is it?

Mr. MAYNARD. Well, there is a lot of effort going into the esthetics, being able to create what we refer to as building an integrated photovoltaic product that is very unobtrusive.

Senator SMITH. With shingles and things like that?

Mr. MAYNARD. That's correct. And over the next few years we are going to see a lot more of that product coming to market and making solar electric on the residential roof either almost invisible or actually an attractive feature.

Senator SMITH. That's very commendable. Again I want to thank you all for your taking the time, going to the trouble of participating in this Senate hearing. I have benefited from what you have had to say. And we're thankful for what you do, each of you.

I want to also thank Bill Bridges, who is our recorder for this Senate hearing. He happens to hail from my home town of Pendleton, and recorded our Ag hearing yesterday in Bend, and did a great job there, too. And thank you, Bill, for coming.

What we often do with Senate hearings, and this will be no exception, we'll leave the record of this hearing open for 5 days. If anyone has comments or statements they would like to be included, we will receive those and include them. And with that, we are adjourned.

[Whereupon, at 11:50 a.m., the hearing was adjourned.]

