NORTHWEST POWER AND CONSERVATION COUNCIL
SEVENTH DRAFT POWER PLAN

PUBLIC HEARING

TRANSCRIPT OF PROCEEDINGS

TAKEN ON
TUESDAY, DECEMBER 15, 2015
6:30 P.M.

ECOTRUST BUILDING
721 NORTHWEST NINTH STREET
PORTLAND, OREGON

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TOM KARIER, MONTANA

PAT SMITH, MONTANA

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COUNCILMAN LORENZEN: Good evening, everyone. We're here -- don't know whether you call this a meeting or assemblage or what, but we're here to take --

AUDIENCE MEMBER: We can't hear you.

COUNCILMAN LORENZEN: One moment, if you will.

We're here to take your testimony, your input on the Draft Seventh Power Plan. And we have -- we're scheduled in this room until 8:00. We have about 12 or 15 people signed up, so given that that is the number, we have about five minutes per person.

If -- if -- the other thing I wished you would consider, I do not want to rob you of your day in the sun or day of infamy, whatever might be, but I notice there are a number of folks from the Sierra

Club. And if you have similar comments, I would appreciate if you would all come up at the same time. And I will invite four people at a time up to the -- up to the podium and to the table.

And if your comments follow along the same line, I would appreciate if you would indicate your concurrence of the prior speaker or add additional comments to the extent you feel appropriate. That may help us to get through the schedule tonight and allow people who have individual comments or different comments the opportunity to fully explain their position.

So to start with, Tom Eckman will give a brief overview of the Seventh Power Plan and then we'll jump right into the public comments.

MR. ECKMAN: And this indeed will be brief. So we have about five principal findings. I'll walk through those and then we'll go through the resource strategy that's in the Plan, in the Draft Plan, and then we'll turn back to you folks to comment on what we've done in discovery.

First, we have a little summary of the Power Plan requirements. The goal of the Power Plan is to ensure reliable and adequate regional power supply at an affordable cost going forward, taking

into account environmental impacts. The Plan guides primarily Bonneville's resource acquisition, but it also is a message and guidance to the remainder of the region for resource development for those utilities that are not supplied by Bonneville.

It has three major elements: A forecast of resource need going forward, a plan to meet those needs, and we update it every five years. This is the seventh update since 1982, when the first plan was started.

First key finding, it's a parallel process here. We've got a wedge chart that shows the amount of resources developed by type. This is the annual energy slide. This is the amount of energy efficiency being developed in the resource portfolio, regional resource portfolio over the next 20 years.

It's about 4500 average megawatts of energy. On top of that there's some natural gas and solar and wind resources filling out the portfolio. The renewable resources that are being built in that portfolio are largely in response to the existing regional resource portfolio standards for renewables in the region.

On the capacity side, winter peak energy,

we see about 10,500 megawatts of capacity being provided by energy efficiency. So from the standpoint of annual energy and winter peak energy, energy efficiency is the dominant resource in the resource portfolio over the next 20 years. On top of that are some demand response resources. And the average portfolio is about 700 megawatts, but it varies between zero in some futures and up to 3,000 in others. So it's not a single number.

There's also some natural gas at the end and some wind and solar PV that they'll provide a lot of -- a lot of energy during the peak periods. And so they don't show up very much in the chart. So natural gas, demand response and energy efficiency are the dominant supply options for meeting winter peak demands going forward.

When we look at what happens after we apply energy efficiency and cozen standards to the process, this is the net load after energy efficiency and you can see it starts out about 20,000 average megawatts, and it finishes at about the same point. So the major thrust of the analysis that we've done says that in well over the 80 percent of the cases we can meet 100 percent of load growth going forward -- load growth -- not all load,

load growth with energy efficiency.

This is the amount of energy efficiency called for in the Plan. This is the amount that will be developed by federal standards going forward. It reduces the demand by about three-tenths of a percent in terms of annual load growth from the federal standards adopted since the sixth plan was put into action in 2010.

That's the net load growth after we'e done. 80 percent of the futures we see no load growth. That's the worm of load growth in the existing policy case. If we take the carbon risk case, that's another scenario where we added the social cost of carbon and we end up with the same net result. If we take the low gas price scenario on top of that, we end up with the same result. At the -- at least through 2015 to 2020, we see no net load growth even when we assume less than $3 per million BTU gas going forward.

In the lower conservation case, which is this upper red line there, building less conservation to the tune of about 1200 megawatts, about 25 percent less than the base scenario. Cost to region about $14 billion in under-investment and energy efficiency.

This is the carbon look. We have about seven scenarios that we've thought of here. The first one is the average carbon emission for the Northwest Power System between 2000 and 20 -- or 2012, that's the average. It ranges between about 40 million metric tons a year, up to over 65. But the mean value across all those years is 55.

We have three coal plants scheduled for retirement over the next ten years: Centralia in Washington state, Boardman in this state, and North Valmy in Idaho -- or in Nevada, that serves Idaho Power. If those weren't retired, we'd take 55 down to 45 million metric tons.

With their retirement, the existing policy case takes us down to 34 million metric tons. That case also includes about 4,500 megawatts of energy efficiency and demand response. So that's the existing policy cases. All RPS in the region, all existing energy efficiency that's cost effected to pursue going forward.

If we add the renewable portfolio standards at the regional level, not state level, regional level, everybody in, that drops it to another five million metric tons. If we take the carbon risk case, which is where we take prices of

carbon and raise them somewhere between zero and $110 a metric ton going forward, that reduces out year 2035 carbon content down to about 24 million metric tons per year for the power system.

If we add a couple other scenarios there where we raise the price of carbon based on the social cost of carbon, the mid range ends up at around $60 a metric ton. The social cost of carbon high ends up at about $80 a metric ton. We see less carbon reduction. What's happening here is those carbon prices dispatch natural gas ahead of coal, that reduces our carbon footprint.

Without those carbon price increases, coal continues to operate until we get down to the last carbon reduction scenario where we actually take all existing coal plants in a region out of service. That gets us down to about 12 million metric tons. It also takes some inefficient gas out. They don't all cost the same.

That particular increment at the regional level is a $34 billion investment and that increment to get down to 12. If we just close the coal plants it's 20. So the first order of business is to get rid of the high carbon producing resources if that's what your goal is.

The resource strategy, we see 1400 megawatts on average for the first six years through 2021. As I said earlier, about 4500 over the 20-year period. If we expand the use of the demand response, that's a new resource in this region. First time this plan has really called for some significant components of it. The last plan called exploration. This plan calls for actual development because we need it for winter capacity. It looks like a really attractive resource.

With respect to renewable resources, we want to encourage renewable resource development that brings with it winter capacity. And that's probably the biggest message out of there. We -- that would encourage things like geothermal development, perhaps wave energy and other resources that might be able to provide consistent winter supplies, not intermittent supplies.

We don't see that changing in the renewable resource standard from region really, is a satisfactory way to get rid of the carbon and develop resources that are cost effective at this point in time. Resource strategy also relies heavily on existing natural gas to make up for resources that are being retired and also to

backfill against resources that are more carbon intensive going forward if we see carbon reduction goals being met. Individual utilities might have a need for those resources if they can't access market supplies.

On regional resource use, this is part of the deal. We assume that there's a big, happy family in the region. That everybody that has resources will supply in-region need. If those resources are sent out of region, we end up building more here as the consequences. And that's clearly indicated by the analysis.

Finally, we need to expand resource alternatives, in particular, energy efficiency and renewable resources that have more constant output, enhance geothermal or wave energy as I said earlier.

So that's the resource portfolio and it's now your turn to comment.

COUNCILMAN LORENZEN: Tom, thank you very much.

I'm going to call the first four names. If you'd come forward, appreciate it, and we'll start the testimony.

Bob Paleck, Megan Schrader, Ken Nichols, and Tim Sheldon.

MR. PALECK: I'm Bob Paleck.

COUNCILMAN LORENZEN: Bob, welcome. Begin, please.

MR. PALECK: Good evening. My name's Bob Paleck. I live near Vernonia in Columbia County, Oregon. And I -- on behalf of Western Oregon Electric Cooperative and the Pacific Northwest Generator Cooperative, both of which I serve on.

MR. CHAD: Sir, can we have you use the microphone, please.

MR. PALECK: Sure.

COUNCILMAN LORENZEN: Start again.

MR. PALECK: We got it to work.

I am grateful for the opportunity to come before you to tonight with some comments on this Seventh Power Plan and appreciate the opportunity.

The reason I'm grateful is because in the process of developing the Plan, it's very obvious that both the Council as well as staff supporting you were listening. And that's terrifically gratifying because frankly we spent an awful lot of time trying to understand it. But in light of that, I'd like to help you understand who we are.

Some of you know where Vernonia is. Let me put it on the map a little better for the others.

Vernonia is about 40 miles from here and it's kind of the capital of the area west Oregon serves, which are the five northwest counties in the state of Oregon. And if you've obviously been paying attention, you know that those five counties right now are on the top of the list of Governor Brown's disaster area. As a matter of fact, as I'm speaking here tonight, we're still trying to restore a little over 1.8 -- almost two miles of transmission line on the Scappoose-Vernonia Highway.

We've still got customers out of service no matter what you read in the Oregonian. And frankly, it's not easy. The reason it isn't easy is because it's expensive. We've only got less than 4,000 members, not customers, not rate payers, members of that cooperative. And already just the first of October this year, we had to raise rates six percent as well as increase our per meter charge to $38 per month. We have the highest electric cooperative rates in the state of Oregon. We're not proud of that.

But once again, knowing who you are and that you are paying attention, you'll kind of reflect back to the 2006 and '7, and understand, well, this one is the sixth, what we call FEMA

events, in love with acronyms the way we are, in eight years. And it's only the 15th of December. The mud slides are continuing to occur, but as of noon today, the most reliable estimate was that we've already spent just over $500,000 recovering from this storm.

Now, I'm bringing this to your attention because although the plan goes into great detail about generation and equivalent of how much that saves us to conserve, when you get down to the end of the line, like in the Woody Guthrie song that he wrote for the BPA quite a few years ago -- and he wrote it about Vernonia, by the way -- when you get to end of the line, and we're not a generating cooperative, that is still a significant amount of money that frankly we're not budgeted for.

Being a cooperative we have no profit to dig into. Essentially, every time rates go up for any other reason, we have to pass it on to the membership, not the customers, not the investors. There's only 4,000 of them.

That great increase alone raised the average bill for a residence that uses 1,000 kilowatt hours per month by $10.50. 98 percent of west Oregon's membership meters are residential. We

don't have any industry. If you're familiar with the area, you know it's the tree farm. That's where your toilet tissue, boxes and construction materials come from. We're very proud of that. We get to live there. It isn't easy. Maybe that's why more folks aren't trying to right now, but it is expensive.

So it was apparent to me when I last spoke to a few of you in Astoria a little over a year ago, you listened. And that's why I'm back tonight, once again, expressing my gratitude. But among other things, I wish you'd take a harder look about things like setting targets as opposed to ranges. Frankly, targets don't work. Every year we look forward to providing a little bit of money back to the membership if there's any left over. And since I've been a board member going on 11 years, that has not happened.

I wish you good luck on it if you stick with targets, but I was gratified to see in demand response alone on the slide you just put up there, it didn't mention that 700 megawatts -- because people like us, we can't afford smart meters. In that one -- one six-day event, we've lost essentially any headway we might have made to the

tune of $500,000.

The other thing I'd like to leave an impression on is the absolute necessity of hydroelectric power to us. Not only are we concerned about the economics and the fact that it's the cheapest available, but we are living consequences of climate change. Whether you want to argue it or not, frankly, I don't care. On the other hand, a lot of us believe in it because we see it. And it's not just worrying about the number of leaves in the storm drain. Thank you very much for the opportunity. I appreciate it and most -- most appreciate the fact that you are listening.

COUNCILMAN LORENZEN: Thank you, Bob.

Megan.

MS. SCHRADER: Good evening, Chair Lorenzen and members of the Council. My name is Megan Schrader. I'm the Executive Director of Tech Net in the northwest region. Tech Net represents over 70 of the nation's leading companies in the fields of information technology, ecommerce, Internet media, venture finance and green technology. I cover state and local policy for 15 states, including Washington, Oregon, Montana and Idaho.

Energy is a top priority us for Tech Net. It's a really great issue for us because not only do we represent some of the cream of the crop of clean energy technology companies, but also many of the consumers who invest in and use those technologies.

Tech Net supports policies to spur deployment of clean energy resources such as fuel cells, solar, wind demand side, enhanced clean combustion and clean transportation, and we work diligently to advance them. Tech Net also supports smart grid technologies that increase the reliability and the resilience of electric grid. Enable clean technologies in the electric vehicles and help consumers reduce their electric bills. Tech Net supports empowering consumers with access to their energy data and technology to manage and reduce their energy use.

Thank you so much to the Council for the opportunity to comment on the Seventh Power Plan and for the open and transparent process that the Council has instituted. We believe that Council staff has conducted robust and thorough analysis of the Northwest Power System, and it's constructed valuable recommendations for the region. We have identified a few issue areas in the Draft that we

believe should be addressed in both the final Plan and in ongoing Council work following the Plan's release.

These areas are, first, demand response and distributed generation forecasts should included as a target in the Plan and used for both resource and transmission planning. Second, that integrated demand side management captures all demand site resources into the planning processes at the Council, which would be energy efficiency, demand response and distributed generation.

Third, the consideration that technology maturation and consumer adoption is faster than expected by utility planners. Fourth, that consumer -- or customer, sorry, and vendor engagement will accelerate distributed energy resources, cost effectiveness and adoption. And there I'm referring to energy efficiency, all forms of demand response and distributed generation.

And finally, that Pacific Northwest should consider new methods of procuring, evaluating and integrating cost effective, distributed energy resources. Tech Net will submit full written and detailed comments later this week of a more robust nature, but we -- we've worked in conjunction with

many of our members and also with Ken Nichols on my right, from EQL Energy, who will provide additional remarks. Thank you for the opportunity to comment today.

COUNCILMAN LORENZEN: Thank you, Megan.

I'm sure everyone knows, but just as a reminder, we also obviously take written comments. So to the extent you feel you have not had the opportunity to fully explain your position in oral testimony, we encourage you to submit written comments in support of your position.

Ken.

MR. NICHOLS: Thank you, Chair Lorenzen and Council members. I'm just here to provide a few more details. I live here in Portland and I followed and participated in parts of the Plan development, so I'm happy to provide some comments to Tech Net and to you guys here this evening.

The first one was include targets for seasonal capacity, winter and summer, for all cost effective distributed energy resources. So this means energy efficiency, demand response and distributed renewables. The Plan, Draft Plan has a target for energy, average megawatts, but has left off the target for capacity.

And everything we hear, see and even read in the Plan suggests that capacity is, in fact, something to be focused on in the -- in the next five to six years, especially if you're going to integrate renewables and start closing some coal plants, et cetera. So we think it's important to begin focusing on capacity as a target. We think you need to target and begin to measure it if you're going to achieve it.

Second, we recommend the region to begin to move towards integrated DSM and should perform distribution resource planning. IDSM is looking at measures that provide both energy and capacity. Examples are smart thermostats, building management systems, VFDs or variable-frequency drives with controls, so you're beginning to see it. I think there's a table in there that has integrated -- in your first page, that kind of shows the different levels of -- or different categories of DSM.

And certainly energy has been a big part of the northwest. It's -- it's a non-dispatchable form of capacity reduction because all the -- as Tom showed, the energy efficiency that we get here in the northwest does reduce winter and summer capacity, but it's not dispatchable. And demand

response has a dispatchability characteristic.

You also see a category has price and behavior base and you're going to start seeing more -- you're going to see time of use and variable rates begin to play an impact on the load and the load forecast. And frankly, the Council in its load forecast has none of those aspects in it at this stage. And we think in the next five years or certainly the next, you know, 20 years, you're going to see a big impact from that -- from that type of DSM.

And then the fourth category is education and market transformation. And we're big supporters of NIA. And that's called out in the plan for them to begin playing a role and looking at these types of technologies and how they -- how they contribute to the resources of the northwest.

Third topic is to include a target for demand response specifically. The Plan calls for seven -- a range of 700 to 1,000 megawatts by 2021. We think soft words, like, "be prepared" or "continued efforts to establish" are insufficient and to meet Council objectives. And you don't see those words tied to energy efficiency and we think it's time for the region to move towards targets.

Just to give you some numbers, 1,000 megawatts is about 1-1/2 percent of the winter peak in the northwest. And if you look at winter demand response programs in other parts of the country, Quebec, the Northeast, Ontario, et cetera, you see ranged -- this is, like, old data, this is 2013 data -- you see ranges from four to five percent of winter peak coming from demand response so -- so we are to say 1-1/2 percent is a target for 2021 is conservative in my estimates.

So why target DR now? A couple of the reasons, one is we've heard things like lead times on demand response six months to a year. Well, I would say that may be true if you're going to curtail a pulp refiner or an aluminum smelter. You could get them to curtail in six months if you get good contracting mechanism.

But for the demand response I'm talking about and what's happening around North America, it takes years to engage customers, put in proper control systems and do it in a way that doesn't inconvenience customers. So if we're going to do this right, we need to begin now because the lead times are years to begin to aggregate and put customers into these kind of programs.

The other reason to start now is lost opportunities. You hear in the energy efficiency world all the time, but new controls, new systems, new construction, if you're not there making those decisions and involved in the decisions when they're being made, you would lose that opportunity. So we think, you know, being prepared and efforts to establish -- again, doesn't get -- doesn't get us there.

And finally, you know, I've looked at -- in there is like a census of integrated resource plans, 2015 IRPs from some of the IAUs. There's over 1700 megawatts of gas generation being planned for between 2020 and 2026. Most of that is peaking power generation. So my fear -- my fear is that the region justifies natural gas generation for a need for capacity, not energy, but once built for capacity, they'll run it and they need to run it and the economics change. Once you have something in place, you should use it. That's how the economics work.

An example, Jim Yost isn't here, so Idaho Power is an example. Idaho Power in 2012 finished Langley Gulch. They had over 400 megawatts of summer DR, demand response, irrigation, air-

conditioning, et cetera. When they finished Langley Gulch, some of their forecasts for load growth and capacity didn't materialize. And their decision was to try to turn off, get rid of all of the demand response programs that they had established, because they had excess capacity. So projections makes sense. So I just bring that up as an example of what can happen if you don't begin to develop this resource today.

I think the -- the last reason is people still don't believe it here in the northwest. It's still not real. It's not reliable. So I think you need to gain comfort with the capabilities of -- that come with this new technology or new programs. I think starting now helps. Hopefully, I'm not going too long I'm almost done.

Actually -- oh, one last thing, market reliance. I read the -- in the Plan there's some risk that won't need demand response because we're going to be relying on the market. And I know that that's caused some angst in the past, I think. And they bring up Enron and stories about relying on the California market.

And I think in general, I think if you do rely on the market for that capacity, it's going to

be resources from the Southwest which will be natural gas and coal that we'll be importing. So in general, I just don't think it's a great policy to be relying on the market when we have cost effective resources like energy efficiency and demand response that, again, are, I think low-hanging fruit at this stage for this region. Thank you for your time.

COUNCILMAN LORENZEN: Thank you, Ken.

Tim.

MR. SHELDON: Thank you, Chair Lorenzen and Council members. Ladies and gentlemen, I'm Tim Sheldon. I'm a Washington State Senator representing the state's 35th District which includes all of Mason County and parts of Thurston and Kitsap counties. I also serve on the Energy Northwest Executive Board. I was appointed to the executive board by the agencies 27-member board of directors in 2003. And it's in that role in which I attend council meetings which brings me here this evening.

On the executive board of Energy Northwest, I take the role of protecting first and foremost, the best interests of Washington and regional rate payers. Among several interesting public roles, I have already served as a public utility district commissioner and am currently a

county commissioner. So I have some idea of the challenges you all must have faced to ensure local voices and interests for community throughout the region who are reflected in the Draft Seventh Power Plan.

It is my opinion that you have accomplished that task well by being responsive in this Plan to local interests and concerns. As Energy Northwest staff commented during the hearings in Tri-Cities, this Power Plan presents a great deal of research and thoughtful planning which will hopefully guide the Bonneville Power Administration and other regional energy organizations to work together to achieve our future energy needs in a responsible, cost-effective manner.

I also serve on the Senate Transportation Committee as well as the Joint Transportation Committee. The prospect of carbon reduction through increased use of electric vehicles powered by clean hydro, clean nuclear, or renewable energy holds our greatest opportunity for carbon reduction gains.

This is why Energy Northwest and many Washington state utilities advocate for local utility flexibility for achieving carbon reduction goals, either through generation transmission or

transportation. The Council's push for further smart grid development to specifically integrate electrical vehicles into the power system is timely and sound, and again, appropriately aimed at the sector which as the greatest challenge and greatest opportunity for carbon reduction.

Let me also reiterate what you heard from Energy Northwest staff in Pasco last month. The Council's Plan acknowledges, and rightly so, the enormous potential for small modular reactors and advanced nuclear energy. The Plan calls for regional attention, again, rightly so, to our nation's abundant and controllable nuclear fuel supply and despite from what we have all heard from a few activists, nuclear energy remains immune to the price fluctuations that affect natural gas, and unlike natural gas, low-cost nuclear will be unaffected by future climate policy.

I would personally like to thank you for keeping lower income rate payers in your thought process and at the forefront of this plan. I'm also vice chair of the Washington state energy -- Washington State Senate's Energy Committee. And my colleagues and I are very much aware of the enormous opportunity for energy efficiency gains if

individual rate payers are engaged and properly informed by the utilities.

We also know, as you do, that low-income families among other segments are a very-hard-to-reach group. Your recommendations to BPA and utilities to gather demographic and business data either independently or from government agencies to help identify and engage low income, hard-to-reach groups, holds significant potential for all of us if such guidance is taken seriously and followed.

On a personal note, over the past several months, I have enjoyed my opportunities to attend your meetings. You have an excellent staff and you do an excellent job of listening. So thank you very much tonight, Mr. Chair and Council members, for your time and hard work, and all that you have put forth on this Draft Plan. Have a great evening.

COUNCILMAN LORENZEN: Thank you very much. Thank you for your comments.

And I'm going to skip around a little bit on this list. And so the next four people we'll call up will be -- have an indicated affiliation with the Sierra Club. Gregory Monahan, and I'm sorry if I mispronounce your name, it's Rhett Lawrence, Patricia Bellamy and Diane Winn. And I know I

mispronounced names and I apologize profusely. And Gregory.

MR. MONAHAN: Good evening. Thank you for the opportunity to speak. My name is Dr. Gregory Monahan. I'm a resident of Portland, Oregon. I'm here speaking on behalf of my three grandchildren and the children of Oregon and Washington. I've spent the last six years developing and maintaining a climate change and sustainability course content for the required engineering curriculum at Portland Community College. During the same period. I've served on the Sustainability Advisory Board for Lake Oswego. I currently serve as the chair for the Beyond Gas and Oil Team for the Oregon chapter of the Sierra Club.

We have now gone beyond the point where any reasonable person can doubt that humans are causing the warming of earth, primarily by burning fossil fuels. The imperative to move to clean, sustainable energy sources is well understood by anyone who has taken the time to understand the science. Adopting a full cycle -- life cycle accounting approach to analyzing the carbon impact of fuels will lead one to the inescapable conclusion that natural gas is not a clean fuel bridge to the

future.

The latest independent research demonstrates that leakage rates for fracked natural gas have been hugely under-reported by the industry. Quoting from a paper by Dr. Robert W. Howarth of Cornell University, "Using these new best-available data and a 20-year time period for comparing the warming potential of methane to carbon dioxide, the conclusion stands that both CO gas and conventional natural gas have a larger greenhouse gas than do coal or oil for any possible use of natural gas. In summary, there is no fossil fuel solution to the fossil fuel problem."

I urge you to aggressively plan for a fossil-fuel-free electrical power system and begin the implementation of that immediately. Recognize the need for fossil fuel power no longer exits. Renewable energy sources coupled with energy conservation can meet our needs now and for the future. Completely eliminate from the Plan any new construction of natural gas fuel plants beginning immediately. Recognize that peak power needs are beginning to be able to be met by renewable storage facilities using current technologies available at commercial scale.

I urge you to become part of the solution by actively seeking partnership with energy storage companies to build proof of concept energy storage plants. As someone who has made a commitment to lifelong learning, I expect no less than the leaders of -- from the leaders of society. The future welfare of our children and grandchildren demands leadership from you. Thank you very much for your attention.

COUNCILMAN LORENZEN: Thank you. Now, I'm not going to pronounce your name again. Please let me know your name.

MR. LAWRENCE: Chair Lorenzen, Council members, my name is Rhett Lawrence --

COUNCILMAN LORENZEN: Rhett, yes.

MR. LAWRENCE: I'm the Conservation Director for the Oregon chapter of the Sierra Club. I'm here on behalf of the more than 20,000 members and supporters of the Sierra Club in Oregon, both to thank you for your important work on the Seventh Power Plan, and to urge you to continue to give priority to energy solutions that move us away from fossil fuels and toward a more renewable future. Thank you for allowing my brief comments this evening.

The Sierra Club is pleased that the Draft Seventh Plan builds on the power council's previous plans that demonstrate energy efficiency is the regions most cost effective and abundant resource. In fact, the Draft Plan shows that the region can meet all its energy needs through energy efficiency and reducing demand. It is clear that there is simply no need to build new gas plants anywhere in the region or to continue using coal power. However, we have do have some suggestions to make the Draft Plan even better in it's final form.

First, we believe that the Seventh Power Plan should include stronger energy efficiency targets. The Plan can reduce -- the Plan can reduce electricity bills and continue our region's clean power leadership by maximizing the amount of energy efficiency in the northwest.

Over the past 35 years, energy efficiency measures have helped the region to greatly reduce our electricity bills, saving about $3-1/2 billion every year. The final Plan should set a more ambitious energy efficiency goal than the current 4500 megawatt savings target. Our region has always met its energy efficiency goals so we can and should aim for even greater savings.

Second, the Council's Plan should push states to set an ambitious -- to set ambitious renewable energy goals to affect our health and climate. Nowadays, many renewable resources are cost competitive with coal and gas. Investing in renewable energy can create good family-wage jobs.

But the Council's current energy models undervalue renewable energy and don't consider its full potential to help meet electricity needs in the winter when demands are high. We believe that the Seventh Plan should call on states to use more renewable energy and speed up our transition away from dirty coal and climate-polluting gas.

We also urge the Council to reduce demand instead of adding any more climate pollution in the form of new fossil fuel generation. As you know, gas plants cost a lot to build and create a significant climate pollution of their own, and the truth is that we don't need them. Instead we believe that the final plan should include a 700 to 1100 megawatt target. A low-cost, higher-term demand response programs that incentivize using power outside of peak demand times.

Together, aggressive efficiency and demand response targets make it possible for our region to

power the next 20 years with clean, low-cost energy solutions. And, of course, accelerating the retirement of existing coal plants is the single-most important cost-effective step we can take to meet our regions carbon pollution reduction goals.

We believe the Council's estimate of coal retirement is conservative, and that more coal plant retirements are likely to occur or be scheduled in the next few areas. This argues for a more robust analysis of how renewable energy can help fill that gap.

Finally, the Sierra Club urges the Council to conduct a full assessment of salmon recovery costs in its final Plan. As the dams and the federal hydrosystem age, their maintenance costs will continue to skyrocket. At the same time, climate change is further stressing our already imperiled salmon stocks.

We've also recently become more aware of the importance of those salmon for resident northwest Orcas. We believe the Council should take an honest look at the costs and benefits of maintaining or retiring the four large but limited output dams on the lower Snake River to aid passage and survival of wild salmon stocks and the

consequent impact on Orcas.

Indeed, the Council has done such analyses in previous plans, but failure to do so here is a major shortcoming. We strongly urge the Council to update and expand its earlier lower Snake River dam removal and energy replacement analysis as an addendum to the Seventh Plan.

So in conclusion, we do believe the Council and its staff has done good work in preparing this Draft Seventh Plan. There is some room for improvement, however. And we hope you will take our suggestions to heart to complete the Plan. So thank you very much for the opportunity to testify tonight.

COUNCILMAN LORENZEN: Rhett, thank you very much.

Patricia Bellamy, please.

MS. BELLAMY: My name is Patricia Bellamy. Thank you for the opportunity to speak this evening. I'm here to give you a nurse's perspective. I've read your charter. I commend your efforts in saving citizens' dollars and improved efficiency. I strongly suggest you add renewables to your mission statement to read "Will ensure affordable, reliable and renewable energy systems." With your leadership

we can and must move away from fossil fuels to clean renewable energy. Every effort must be made immediately to take and tackle climate change by stopping combustion of fossil fuels.

Nurse's are very worried about the accompanying health-and-safety-related issues with climate change. Such as vector-born diseases and wide-spread famine from drought and floods. Climate change is a looming public health crisis. I'm currently a member of the Sierra Club health outreach and I'm also a retired critical-care nurse. I have over 40 years membership in the American Nurses Association, ANA, as well as Oregon Nurse's Association, ONA.

The following is from the ANA house of delegates resolution it reads: "Resolve that the American Nurse's Association recognizes that the challenges we face as the result of global climate change are unprecedented in human history. It is critical that nurses speak in a united voice and advocate for change on both individual and policy levels."

Additionally, this year, ONA sent a letter to Governor Kate Brown, encouraging her to continue the policy of no coal export. Prevention is the

cornerstone of public health and there are no single silver bullets to combat climate change, but there are silver buckshot. Adding more job-creating, renewable energy systems is a piece of silver in efforts to further prevent climate-related risks to Oregon citizens. Policy and innovative changes such as the evolving electrical grid and additional renewables can meet the challenges of demand and energy shortage. Our future depends on it. Thank you.

COUNCILMAN LORENZEN: Thank you very much.

Diane.

MS. WINN: Good evening, I'm Diane Winn. I'm here from Portland and I don't come from a technical background, but everybody else does here, but I -- so I went ahead and read your bios and I was very impressed with your experience and background. And I really think that this is reflected in the Council's Seventh Energy Plan which emphasizes the positive role of energy efficiency and demand response. But with my background in nursing and public health research related to child health and safety, I would like to point out a couple of issues that I'd like you to consider as you move forward with finalizing this plan.

All major medical, nursing and public health professional organizations have raised the alarm about the numerous negative effects of climate change on human health, and support efforts to move towards a clean energy future. As you well know, coal is the most carbon-intensive fossil fuel and is a major contributor to climate change. It accounts for over a third of carbon emissions in the U.S., and only half of the emissions globally. I, therefore, urge you to accelerate the retirement of existing coal plants in the region. This is an important step to meet our regions carbon-reduction goals.

But natural gas, as other people have mentioned, should not be considered an alternative. Like coal, natural gas contains many hazardous pollutants and also contributes to climate change. Natural gas emits methane which is one of the most potent greenhouse gases. Therefore, I would ask that you also transition us off of gas and move us towards a renewable energy -- towards renewable energy sources.

I think we all need to take to heart the words of the American Academy of Pediatrics in their recent policy statement, which states that failure

to take prompt, substantive action would be an act of injustice to all children. With all of the recent action and progress that has been made to address climate change, now is an opportune time for you to join in these efforts to protect our children's future and set up a very aggressive, clean energy standard for the northwest for the next 20 years. Thank you for your time.

COUNCILMAN LORENZEN: Thank you very much. Thank you for your testimony.

Steven Eldred and I think it's Clyde Wolf. And Bryce Yonker and Michael -- is it Dean or Deer? I'm not sure which. I'm sorry.

We'll start with Steven.

MR. ELDRED: First off, my apologizes for not dressing nicely. I'm here for the cause, not the appearance.

Okay. So now -- to start off, I don't normally share my thoughts about climate change to just anybody, knowing that most people -- the average person is -- they have -- too many other things are going through their mind, as an example of the way most people today think. It's -- if there's anyone or anything that I plan to devote my time to and has -- it has to be impact-oriented

people which most of us here are. That's why I'm here today.

Out in the world are the universe you see every day, usually the stressed out ones, people who like, say, use too much drugs or something, which obscures the way the brain thinks, their awareness. If there was a pros and cons list for continuing to let oil usage continue, I say just ignore the pros because obviously allowing to continue more usage is an invite for more climate degradation. As -- as oil -- as the consequences of oil outweigh the benefits of them.

What level restrictions would be placed on the free market to completely ensure carbon standards are met. That depends on what's sold and if -- if it's -- if there has to be impact restrictions, then the fact that it's a free market is a bit if a contradiction, but that's -- that's kind of off topic.

Now, this sounds a little bit -- this sounds like a little bit of an, like, outwardly idea, but it's real and enchanting. Imagine a future, like, say, money wasn't the operating factor of society. There was maybe a merit system. Like, for example, education would be free. Paying jobs

would not be around to be an excuse to shirk your education and involve your mind, your mindset and what affects what.

Not -- I've heard that it's not the love of money that is the problem but in some cases that's not always true. Money still being around is once again the core thing that obscures people's awareness. It basically -- it's like a dollar bill, find a blindfold made of dollar bills, you know.

Okay. Past hardships versus present. Pollution -- back in the -- before the -- life before the industrial revolution, in general, there wasn't much pollution going on because we didn't have as much convenient technology as we do today. And the fact that we today means that there's carbon emissions and greenhouse gases from those devices. But it's -- so until those -- until we reach a future where both are combined we all -- we stay caught in the -- in the mental vulnerability and become prone to be assimilated with polluting companies.

Now, I'm not an expert on the different factors of climate change. I do as much research as possible and I'm still in the process of learning many different things and trying -- and keeping up

with current environmental-related articles, but I'm mainly more about observing typical human behavior which has an impact and -- because it's there. So that's why I'm here today. I just wanted to share my thoughts and -- because if I hadn't to come today, I don't feel as though I would -- I mean, I obviously wouldn't have been another voice to be heard. So thanks for letting me share.

COUNCILMAN LORENZEN: Thank you very much for your comments.

Clyde Wolf, please.

MR. WOLF: I'm Clyde Wolf from Hillsboro, Oregon. I'm a member of the Sierra Club. My topic today has nothing to do with the Sierra Club, as you will find out shortly.

COUNCILMAN LORENZEN: That's okay.

MR. WOLF: It hit me, first of all, that you've viewed very detailed analysis. You've done a lot of great work on this topic. The one thing that I've kind of found missing mentioned throughout all your plan, was the we have a Columbia River and that most of our power today comes from that. Is there something we can do to heal and make the river more productive more helpful.

I've come from Montana and I'm going to

talk just a second about a small dam up in Montana. I don't know if any of you have ever been up to the west fork of Bitterroot River, but there's Lake Como, high in the mountains there in an area that normally gets a lot of snow. Well, now, we know that in the coming years we're likely to get cycles of a lot less snow and more rain in the wintertime. Places like the west fork of the Bitterroot is ideally suited to capture that rain or snow and deliver it down the Columbia River late in the summer.

Now, that's just one little dam, but it has a significant impact on that river and that river could have a significant impact on the Columbia River. The question I really I have is is it now time for us to start looking at those, what I'll call headwater dams, and is it time for us to start looking at building not one or two or three, but dozens to hundreds of these small dams above where the migrating fish go where they would capture water when it lands as rain rather than just snow and release it slowly down the river so that we can use that water.

First of all, those small dams could be -- have a generating source so we now have dispatchable

power for peaking capacity. We have fairly deep, small lakes so we can be putting cold water in those rivers which the salmon so desperately need. And we can capture a lot of that peak flow early in the spring when the BPA and Columbia River is struggling with a factor of too much water. Just -- it's a small piece but I think now is the time to start looking at it. Thank you very much.

COUNCILMAN LORENZEN: Thank you, for your comments.

Bryce.

MR. YONKER: Power Conservation Council Members, staff and guests, thanks for having me. My name is Bryce Yonker. I'm the Executive Director of Smart Grid Northwest. Smart Grid Northwest is a regional trade organization founded to help support grid and smart grid industry and solutions. We were founded in 2009 and last year expanded our focus to expand more broadly across the whole region.

The organization has a growing member base of about 70 organizations, including investor- and consumer-owned regional utilities, growth, grid modernization, technology companies, leading industry corporations, higher education and research institutions, regional and national government

agencies and more.

Nearly 30 organizations directly contributed for the remarks that we have prepared and submitted for you. Like our membership, these comments are from a diverse set of industry professionals including utilities, early and growth-stage technology companies, multinational corporations, higher education and nonprofits. Our remarks for the Draft Seventh Power Plan cover four areas, including smart grid, demand response, demand side management, distributed energy resources and transactive energy.

Keeping in mind the Council's objective and I quote, "Assuring the region a safe and reliable and economical power system with due regard for the environment," and the 20-year time period of the Plan, we believe that each of these four areas requires additional attention in the Seventh Power Plan and certainly leading into the eighth plan.

Although, we address each topic separately, we want to stress that for the purposes of the Council's planning process is useful to the most demand side management resources, including energy efficiency, demand response, distributed generation, dispatchable standby generation, smart

inverters and many forms of energy storage in a systems perspective rather than in an isolation.

We encourage the Council to review Smart Grid Northwest comments. If there is any support we can provide on the smart grid, demand response, distributed energy resources, transactive energy and similar topics, we'd be happy to engage with the Council and regional stakeholders. Thank you.

COUNCILMAN LORENZEN: Thank you very much. Michael.

MR. DEAN: Hi. And it is Michael Dean.

COUNCILMAN LORENZEN: Okay. Got it.

MR. DEAN: I'm here today on behalf of the Public Power Council which I think most of you are familiar with. I'm a senior policy analyst there. For those that don't know that might be in the room, PPC is nonprofit association representing the interests of Bonneville's -- the Bonneville Power Administration preference power customers that pay all the costs of the federal and Columbia River power system. And take power to serve their loads at no profit for their consumers and members.

We are going to be submitting detailed written comments, but I wanted to offer a few verbal comments as well. I should mention also that I

served as an expert on the systems analysis advisory committee in the development of the Plans. So I'm very familiar with Ben's work and I've worked with Tom a lot as well in the development of the Plan.

I think my first comment is that we think the overall resource strategy makes a lot of sense in terms of a mix of conservation, energy efficiency, demand response, some need for natural gas potentially, and also for re-dispatch of existing resources as well. We do have, as I said, some detailed written comments which we hope you'll consider.

A few areas I'd like just to highlight quickly. We do really think there is a need for a range in conversation goal. There's a lot of uncertainty inherent in the forecasting process. And additionally, I think the analysis by your own staff -- well, many of the scenarios are quite closely grouped. There are -- there is a range that are, from our perspective, in the analytical results. So we really encourage you to adopt a range in your final recommendations.

Another area that I know has gotten a lot of discussion, I heard got some discussion at your meeting earlier today, is the natural gas price

forecast in the Plan. It's a key input and we think it's pretty far off right now, given the vintage of when it was done. I'd really encourage to you adopt a forecast that has a midpoint at least that's in line with current futures prices. We don't think there's really a need to guess or make a fundamentals-based forecast for the period of time when there are existing transactions being done. And that should really be the midpoint of your forecast.

Just briefly one other item that you'll see again in our comments, this gets a little technical, but Appendix G to the Plan, which defines a cost-effectiveness calculation for energy efficiency, and defines a lot of variables on a regional level for that calculation. We'd like to have you guys in the final Plan have some recognition at that individual sort of utility service area circumstances may be different than a regional average.

They may have their needs -- may have needs to vary some of those inputs based on their own circumstances. And also, the fact that some utilities conduct their own portfolio modeling, similar to the methodology that you use, that your

staff uses, and that may be a valid way for determining cost effectiveness of energy efficiency in particular service territories as well.

Again, all that's going to be in the comments we'll be submitting to you, definitely by Friday, if not before. And I hope you'll take them into consideration, so thank you.

COUNCILMAN LORENZEN: Thank you, folks.

All right. Brad Mullins, Cameron Yourkowski, Inga Fisher Williams and Art Lewellan.

COUNCILMAN LORENZEN: We'll start with Brad.

MR. MULLINS: Good evening, Council members. My name is Brad Mullins. I'm here today on behalf of the industrial customers at Northwest Utilities. And for those in the room who don't know who we are, we represent many of the large industrial and other large loads in the region, many of which take power from preference customers BPA, and we're very interested in the planning process of BPA and the Seventh Plan as well. So I'll keep my verbal comments very brief. We will be filing some written comments later this week.

However, as an overall comment, we'd just like to express our appreciation of the large amount

of work that the Council members and the staff has taken to complete the Plan and to bring to this current stage. And in addition to that, as far as the portfolio going forward, we are generally supportive of using energy efficiency and demand response as the resource to meet the region's demand going forward.

Now, over recent years, our customers have invested heavily in energy efficiency and so we look forward to doing so more in the future as the current Plan is unveiled and carried through. And then on -- I guess the issue of demand response, I just would like to express our sort of customers -- just the large interest from industrial customers is pursuing demand response. In each of our board meetings, I seem to get a question on, you know, what sort of demand response opportunities are out there. So as we develop those programs, we encourage folks to think about the industrial loads as well.

As far as technical issues go, I think I'd just echo two things that Mr. Dean had pointed out earlier. First, we -- we would also like to see more of a range in the energy efficiency targets in the Plan. And then the second issue is that we

would like to see the utilities -- we would like to have them have greater discretion in the cost effectiveness measurements that they employ to evaluate energy efficiency. So those are my comments. I appreciate the chance to be here today and I'll turn over the mic.

COUNCILMAN LORENZEN: Thank you.

Cameron.

MR. YOURKOWSKI: Good evening, thank you for the opportunity to comment and being here this evening. My name is Cameron Yourkowski. I'm here on behalf of Renewable Northwest. We're a nonprofit advocacy group, coalition of diverse interests, supporting the development of responsible renewable energy development in the four northwest states. I also did submit written comments today prior to coming here this evening, on your website. I'd appreciate it if you'd take a look at those. They're about four pages and they go into more detail than I am this evening.

I want to start by recognizing all the hard work that has gone into the release of the Draft Plan, both by the Council, staff and you, the members. It's a massive undertaking and there's much to support in the Draft Plan.

Sticking with the positive side, the Draft Plan, once again, presents solid analysis on the benefits of energy efficiency as identified cost-effective supply and various energy efficiency measures. We support this work. We support those findings. In addition, the Council has done excellent work identifying cost-effective demand response resources, capable of providing various types of capacity products. And as clean energy advocates, we are especially excited about this new development, using a clean source of capacity out there in the future. And we're very encouraged by these findings and support -- support that work as well.

And we are also pleased to see that for the first time, certain renewable energy resources, especially in Idaho and Montana, were identified as the least-cost sources of energy generation and beyond energy efficiency. And this was a result of the GRAC, Generating Resource Advisory Committee, and the good work of that staff. So we appreciate the efforts of that committee as well.

Switching to some of our concerns with the Draft Plan, I want to call to your attention what we see as a shortcoming on the analysis of renewables

and their ability to contribute to the capacity needs of the system. We understand the Council identifies with the need for capacity to meet the winter peak. And that this is an important focus of the model, however, the Council's current modeling approach assumes renewable resources are not able to contribute in a meaningful manner to meet peak requirements of the system. And this drives a lot of results of the model.

So even though the Council Draft Plan does find that the price of some renewables is least cost, the model limits renewable because they're not modeled in a way that allows them to contribute even collectively as a package of resources to meeting the peak requirements, capacity requirements of the system.

So we are concerned about continuing along this approach for modeling renewables in the future considering the carbon reduction goals of both Washington, Oregon. And what the science tells us is necessary to mitigate worst impacts, climate change, we may think it's necessary to start thinking ahead and modeling how we can run the grid and meet the energy and the capacity needs of the system with the least amount of carbon emissions,

including a large percentage of new renewable resources.

This is why we are asking the Council to include an action item in the final plan to facilitate what we call low-carbon grid study. This would evaluate how renewables and other clean energy technologies can work together to meet both the energy and the capacity needs of the system. Doing so would be consistent with the policy goals in Oregon and Washington, and also the guidance provided by Northwest Power Act to prioritize cost-effective renewables.

Like I said earlier, the Draft Plan does find certain renewables are a cost-effective energy resource. Now we need to prioritize finding out -- finding ways to help them meet the capacity needs of the system as well as contribute to the capacity needs of the system.

So that's our first ask, to include an action item to facilitate a low-carbon grid study for the northwest. Details on what that study would look like and how to move that forward are in our written comments. We please ask that you look at those.

Our second comment is related to the Draft

Plan -- to what the Draft Plan refers to as a 35 percent RPS scenario that was highlighted in the presentation earlier this evening. The work done on this scenario, we feel, is less rigorous than other scenarios in the Draft Plan, and we think it should not be given the same weight as some of the Council's more robust analysis. Our written comments go into detail of some of the underlying assumptions that drive this analysis.

Briefly, the main problem with this scenario is that it assumes that doubling of the amount of the new renewables on the system today without retiring any existing generation coal or existing natural gas plants. And predictably, that results in very costly overbuild of the system and a large amount of exports of energy out of this region. We build more energy than the region actually needs.

So this scenario does not accurately represent the design and the flexibility that is built into existing RPS policies and is anticipated in the new RPS discussions going forward. And so we ask the Council rename this scenario to the high-export scenario to reflect the overbuild of resources and associated exports. And to include a

clear and up-front description of all the assumptions underlying the scenario and any narrative description of the final plan. Again, there's more detail on all the assumptions that we would like to see highlighted in the narrative and final Plan in our written comments.

So in closing, I want to thank the Council again, and staff, for all their hard work on the Draft Plan and for the opportunity to comment this evening. There's much to be pleased with in the Draft Plan but in order for the renewables community to support it, we really want to see a commitment to dig into the renewable energy modeling issues, an action plan for a low-carbon grid study, and also appropriately describing the 35 percent RPS scenario in the final plan. Thank you.

COUNCILMAN LORENZEN: Thank you.

MS. FISHER-WILLIAMS: Good evening, members of the Council. Bear with me as I construct my comments. I just decided walking in that I would address you. I've been interested in energy for four decades and I'm ecstatic to see conservation in the heading of a future power plan for the BPA. Because I can remember working on League of Women Voter's energy panels and conservation efficiency

was laughed out of the room.

And when I was on the city council and we attempted to get the builders to go to two-by-six construction and higher R values for insulation, we had a devil of a time in the '70s because the incentives were all wrong. The builders wanted to keep the costs low and they didn't care about the build because they weren't going to live there. And especially on rentals, it was an uphill battle and I lost many.

Those of us who are old enough to remember the Woods debacle, understand just how important underlying assumptions are because they will drive policy decisions and investments, private and public. And so I'm here to ask you to lean a little bit more into the future. Times are changing. Where it may have taken four decades to get conservation to the heading of the BPA plan, but if you are reading the papers and listening to radio, you know there's a building momentum towards clean, renewable energy. There's no doubt about it.

And when our Mayor introduced the resolution to oppose infrastructure expansion for carbon industries, which passed unanimously, he said he was reminded of being fishing with his dad, and

the drift boat would sort of accelerate and they could hear the rapids in the -- on the horizon. They couldn't quite see around the bend, but they could feel the water moving faster. That's where we are. We're moving faster.

Everybody knows about climate change. There may be folks who hate it and will avoid it and deny it, but they know about it. It's on the table. So I want associate myself with the former speaker's comments about a low-carbon future scenario study. This is where we have to head as a region and if the BPA sets the tone, the states in the northwest can't help but notice. And as they construct their plans, they will align themselves with the tone that you have set, which is critical because many of us want to see the coal plants shut down.

I am unhappily a customer of PacifiCorp which has 60 percent of it's generating fuel in coal. And they have not been amenable to listening to the future. And I bet you that they're going to send their attorneys out to fight the clean power standards to delay implementation rather than face the music. It makes no sense to pour money into yesterday's technology. We're moving forward. This is what America has always been proud about and

known for.

So, in conclusion, I want to get a chuckle out of you and that is a quote from somebody I don't remember, but I've always liked it. It goes like this: If you don't aim for the moon you aren't ever going to clear the top of the trees.

COUNCILMAN LORENZEN: That's very good. Thank you.

Art.

MR. LEWELLEN: I came here tonight, Council, to testify on my experience in the home weatherization program that was started in the Carter era, home weatherization tax credit program between 1980 and 1992. And found that homes today are both more energy efficient, but more comfortable, cleaner, healthier and have higher value, last longer. A value-added use of an investment to make homes not just more energy efficient, but more than just that.

In '92, I transitioned that effort into transportation energy conservation and transportation, and I became and advocate for light rail and the streetcar here in town, better transit. But transportation planning also includes all forms of travel and I see the future -- I see an industry

in the future taking off one day that our grids, our regional utility grids, should incorporate every household being able to have an electrical vehicle in the garage.

My preference is for the plug-in hybrid, that smaller battery pack that can serve as many as 15 times more households than the all-battery electrics, like the Teslas, it's a much smaller battery. And I believe that smaller battery pack is a better match with a rooftop solar, photovoltaic solar systems that in an emergency would act as an emergency battery power system.

So a household that invests in this one is getting more than just a very efficient, fuel efficient car. They're getting an emergent lifesaving system. And I believe that the grid would be more resilient by adding this type of power system to it overall.

So I'm making that statement. That's really the main statement I did want to make about what I see as a future solution addressing the problems that we've had overall fuel energy consumption, household-wise. The amount of travel we do. Household gains the means to monitor and more closely monitor and reduce the overall

consumption both from the house and for driving. And I just -- I'm just see a huge industry growth in that sense which I'm trying to explain as best I can. Okay. So that's really my main point I wanted to make for you tonight. Thank you. Thank you very much.

COUNCILMAN LORENZEN: Thank you, folks, for your testimony.

Dan James, Wendy Gerlitz, Tracy Farwell and Rick Williams, please.

MR. JAMES: Good morning -- good afternoon, members of the Council. I'm Dan James with PNGC Power. Thank you for giving us this opportunity to testify to comment on the Council's Seventh Plan. We do appreciate the development of the Plan. It was accessible and transparent, and as others have said, the Council members and staff did an outstanding job of reaching out to a cross sector of stakeholders.

We do support the Council's acknowledgment of the region's success in meeting the energy conservation targets in the Sixth Plan. We, like others, believe that the Council should establish a range for new conservation targets rather than a specific number because a range would be more

appropriate given the difficulty in forecasting future energy conservation savings.

We support the forecast for growth and demand response programs. A number of our members are deploying those programs or are testing them. However, it may have been overly optimistic to predict 700 megawatts of demand response that will soon be built. We also believe that the Council may have actually under-estimated the need for more natural gas fire generation to meet peak demand after the Boardman and Centralia plants are retired.

Others have said, and we agree, that the Council should update its forecast for natural gas prices because, in fact, the current gas price forecast in our view may be too high.

And finally, we believe that the Council should resist efforts of those who advocate for a reduction in renewable hydropower production. Thank you.

COUNCILMAN LORENZEN: Wendy.

MS. GERLITZ: Good evening. I'm Wendy Gerlitz. I'm the Policy Director with the Northwest Energy Coalition. We are a diverse, member-driven, nonprofit organization that works to promote clean and affordable energy throughout the northwest. The

-- we have worked extensively with the Council on the development of the Seventh Plan, and so I want to start out as a number of people having acknowledged here tonight that the Council staff and Council members, we think you've done an excellent job with both the process and content overall of the Plan.

But in particular, I want to speak to the process. It's been a very open and transparent process this time around. We have felt very included, but also very knowledgeable about what was going on. The staff really kept everyone updated on how the model was working, what assumptions were going in, and provided opportunity for input into those assumptions.

And I really feel that that process has led to a very good outcome for the Plan, with a lot of people participating and really providing input that strengthened both the assumption into the Plan and the analysis. So I wanted to start out with some nice things about the process because I know people have worked very hard to get there, so that's recognized, I think.

We also want to support the energy efficiency analysis in the Plan. It's a huge

undertaking we know. We don't -- we have been diving into the spreadsheets and all of the measure-by-measure assumptions that go into the Plan. And it's a very strong analysis and it really -- it makes it abundantly clear that energy efficiency continues to be our least-cost, least-risk resource, saving customer's money and also reducing greenhouse gases. So we are going to urge the Council to stick with the target, not go with the range.

I am going to agree with PTC that's a lot of uncertainty in those forecasts. However, I'm also going to point out that historically over the course of the last many plans, the Council has consistently underestimated the amount of resources, energy-efficiency resources available, every single time they have underestimated. And we would say that's probably due to the known and available construction that you use in the measure-by-measure approach to adding up known and available measures right now.

Over the next six, 10, 20 years, it's very difficult to predict what resources and energy efficiency are going to be available and at what price. And so we would say that the conservative estimates that go into that assumption really speak

to, it's okay to set the target. We've exceeded it every time and we have no doubt that the region will exceed it again. So ask for what you want and you'll get it and more.

So the second thing we also want to urge -- or thank you for, actually, is the detailed recommendations that focus on ensuring low-income families and other hard-to-reach populations get their fair share of energy efficiency services. This is something that the coalition has been working very hard on with our low-income, advocacy community to approve services to low-income customers.

Those customers, people living in manufactured housing, people living in multi-family buildings, as well as rural communities and small businesses, they all pay for these efficiency programs and it's only fair that they should be able to benefit from these programs as well. And we have more work to do in the region on making sure that these -- these segments of the population really can benefit from energy efficiency. So I really appreciate the detailed recommendations that are in the Plan with regard to that and strongly support those.

We also want to strongly support the demand response programs. I'm going to echo a number of comments tonight that ask for a goal or a target for demand response. We think it's important to give the region a number to shoot for. The demand response in the Plan really shows that this is a low, low cost resource. It's going to save us a lot of money if we can acquire those demand-response resources. And it's important to give the region some kind of a goal, even if it is a range of 700 to 1100 megawatts, in the Plan, we think that's important.

I think -- I think that Ken Nichols spoke very eloquently to the reasons for that. And the -- the resource calls for natural gas that we see in the utility IRPs are just extraordinary, and far above and beyond anything -- any amounts that the Plan actually says that we need in the region. And so the emphasis on demand response from this Council I think is going to be particularly important in the coming years.

Now, I want to just talk about a couple of areas for improvement. I'm probably talking too long, but one is I want to echo Cameron's comments on the improvements that are needed in the area of

renewables analysis. We have talked with a number of you about this, but we really feel the model undervalues renewable resources and their ability to contribute to system needs. I was in the Power Committee this morning. I heard that you're making a few updates to the model in this regard. We think that those are going to be important improvements, but we don't think that they're really sufficient. We think there is a number of other things that need to be improved in the renewables analysis.

And so, specifically, I want to talk for a minute about the 35 percent renewable portfolio standard scenario. Frankly, we think this is the weakest element of the Draft Plan. The scenario, frankly, doesn't really make any sense to us. Build a whole bunch of renewables, but leaves the coal in the system. Builds natural gas, significantly overloading the system. And so I appreciate Cameron's effort to rename the scenario.

I think that would be a good step. But I also want to recommend that this was not a low-carbon scenario in my mind. It doesn't really reduce carbon emission and I'm not really sure what it accomplishes. And it's discussed a lot in the climate change chapters in the Plan. And I'm going

to recommend taking the discussion of that scenario out of those chapters. I think it's very confusing. It's not laid out well what the scenario does and doesn't do, and I don't see any reason for it in those chapters. I think it confuses the issue. So that's another recommendation that I'd like to lay on the table.

And then finally, just on fish and wildlife issues, I would like to note that as the existing hydropower system is aging, the costs to maintain the system are increasing. And we all know that climate change is stressing out the salmon stocks as well. And so we think it's really important to adequately assess the costs and benefits of the lower Snake River dams on the Columbia River system. We think it's important to look at the power system costs and benefits and we think the Council is the right body to do that. It wasn't done within the context of the Seventh Plan.

I think that's actually okay, because I think it's going to be an undertaking to get the accurate costs of maintaining those dams, and to understand how they really affect the power system. I mean, there's a lot of questions that we have about whether they really contribute to the capacity

of the system. I ask that, you know, for a -- a back-of-the-envelope analysis that we did and we weren't really able to get good answers. So we think it's an important analysis and we'd like to see a return to that as soon as the Seventh Plan is completed and do that analysis justice. We're going to be submitting much more extensive comments and so I'll conclude with that. Thank you.

COUNCILMAN LORENZEN: Wendy, thank you. Tracy.

MR. FARWELL: Thank you very much. I'm happy to concur with the same deference that everyone else has expressed to the Chair and to the Council. Being brought in at the draft phase, this is really important. I'd like to offer some information that perhaps wasn't anticipated because it's impossible, because it's only recent data coming form California.

I'm Tracy Farwell, and for 45 years of engineering I've made a good living solving problems for other folks. When you're an engineer, you really better know your science if you expect to keep your job. So I'm coming at this from a science and engineering perspective. And regrettably, it looks to me like the Seventh Northwest Conservation

Electric Power Plan is broken. Not through an inefficiency on your part. It's like any battle plan. After the first shot is fired and reality sets in, the plan is off the table. And the reason is that in the executive summary it states that, "New gas-fired generation may be required."

I'd like to suggest you should hope not. The reason I'm saying that is there's a very poorly reported natural accident in Los Angeles that's currently worse than the Deepwater Horizon blowout in the Gulf. We're not hearing about it in Oregon. We're not hearing about it in Washington. The Gulf accident only ruined fisheries and a coastline for a decade.

The methane storage well that's leaking in the Aliso Canyon, the one that nobody knows about, has been dumping hellacious quantities of natural gas methane for two months now. In my two minutes, I can't tell you the cause nor the solution because the gas company doesn't know and they're not telling us. And they have only a theory about fixing it and they're guessing an experimental fix will take maybe three or four months. So we're up to six months for daylight on this. And not only that, they don't know if it will work at that time or if ever.

And, by the way, I'm sure you already know, methane is 80 times worse for than climate than CO2. You should know, but perhaps you don't, that this accident is dumping 25 percent more methane into your air than all the known industrial leaks estimated by industry in California. The CARB described this ongoing accident as dumping 100,000 pounds of methane every hour.

That's not my number. That's not an industry number. That's regulators who are responsible to rate payers and tax payers. If this methane is not set alight, it represents 80 times 100,000 pounds of -- in terms of CO2. So you take your 100,000 pounds, you multiply it by 80, you get eight -- you get 8 million tons equivalent of CO2 per hour.

If the cost of carbon to society is considered and I don't know whether you've done that in your Power Plan or not, the typical number is $60 dollars a ton. And if you're looking at a hundred -- at these uncontaining escapage rates at $60 a ton, you're looking at $133,000 an hour, for the estimated six months that they say might be needed to plug the well if it works.

If the gas company were paying the cost

for their accident for six months at this rate, you're looking at $575 billion. It's just what you get on your calculator. If they had to pay that, they would quit and go home. Instead our grandkids are getting the bill.

This is like a train wreck where the train keeps coming and I don't know why this is the only one. Did we see this one coming? No. Do we know what's around the corner? No. In my view so far we've been lucky. In my engineering career, if I ever reported any technical incompetence like this to my supervision, my paycheck would soon disappear.

I will summarize my message to the Northwest Power and Conservation Council about what you are getting natural gas industry proposals, a couple of which we've heard this evening, summarized in two little words. I'm sorry if this offends anybody, but from the evidence I've seen in the last week, this is looking like junk science.

Northwest Natural Gas, serving customers in Portland, please explain the real natural gas home economics to your rate payers. In my view, I believe that any suggestion of reliance on gas generating resources should really be eliminated from your planning, for the simple reason that

whatever cost -- whatever cost-effective analysis you performed, the cost just went hellaciously up. Thank you for your time.

COUNCILMAN LORENZEN: Thank you.

Rick.

MR. WILLIAMS: Good evening, Council members. My name is Rick Williams. I live in rural Oregon City. The topic I'd like to discuss tonight is disaster resilient power. I'm here tonight as a Portland State University graduate student in engineering policy and management. As a frame of reference and introduction, I'm a civil construction engineer and ocean engineer from Oregon State University. Retired nuclear submarine captain and an engineering consultant in systems engineering and ocean engineering.

I'd like to encourage the Council to consider disaster resilience in the Seventh Plan. The background for that is during the two term smart grid class that Professor Hammarlund led, we studied the energy policy resources, utilities, technologies including demand response, demand site management and renewables. We also considered the predicted Cascadia event, magnitude nine earthquake -- I was watching the light fixture move over there,

distractedly -- which is predicted in the next 50 years. And that disaster is expected to induce extended outages of the bulk electric grid.

We're not talking about neighborhood grids, we're talking about the bulk electric grid, not to mention the fuel hub in North Portland liquefying, so fuel supplies would be scarce. And also that the solar photovoltaic resource in the state, 84 megawatts uses the older inverter standard of anti-islanding so most of that 84 megawatts will not work if the grid reference is down. Or if you have a back-up generator, when your fuel is exhausted, the solar panels would be there but they will not provide power.

I searched the Sixth Plan for the words "Cascadia, earthquake, disaster and resilience," and found that they were not mentioned. I studied the -- or I searched the Draft of the Seventh Plan for the same words and found earthquake mentioned once and historical reference, referring to Japan and the Trojan Nuclear Plant where I was a construction engineer. So it appears to me that disaster resilience has not been brought to your attention as yet. So that's my purpose here tonight.

I'd encourage the Council to address

disaster resilience along with the energy efficiency and demand response that is in the Draft Seventh Plan. The business model and ancillary services required to implement demand response can also serve disaster resilience if it's addressed at the senior level that you represent and if the systems approach is used. We need to consider least cost, integrated resource, but also what is the value of power in a disaster.

Voluntary reductions require knowledgeable consumers, knowledgeable consumers who need to be informed about the threat of the Cascadia event as well as the situation with their solar arrays if they have them. The technologies, demand response controls, distributed generation, renewables, storage and standby dispatchable generation fit into a systems approach for disaster-resilient power.

We held a disaster resilience solar PV workshop after the class that some of you were aware of in smart grid. 42 members across multiple disciplines including the director of the Oregon Department of Energy, deputy director of Oregon Emergency Management, and we discussed the situation, the problem statement and addressed alternatives, which I have a paper, and I'll submit

to the Council.

The residential use case was the catalyst for the discussion. And although that was interesting, particularly for families with medical special needs who need electricity for assistive devices, and also for the rural use case where the community centers are distant, it turned out that the community centers caught the interest of the workshop members. Because that's where the displaced citizens can be served best.

What really was the outcome of the these 42 people that I had not anticipated as the -- as the workshop leader, was a concept called disaster resilient community micro-grids. Recognizing that schools and colleges are evacuation sites. That senior centers are used to serving people. Service halls, grange halls, churches are used to collections of people, libraries, and then critical infrastructure. I'm an emergency responder and when I was a third fleet command and control officer, I did the civil operations plan for U.S. Third Fleet, that we will be using in the event of a Cascadia event.

You've got to serve the displaced citizens. And, if possible, if you can encourage

with a small amount of disaster resilient power citizens to shelter and place, you have less displaced or refugees for the emergency managers to deal with. So there is a public benefit case for disaster resilient power. Along with the cost, again, please consider the value of power in a crisis situation.

In summary, I'd like to encourage the Council to address disaster resilience in your Seventh Plan and encourage BPA, the utilities, and the public utility commissions to consider that in the rate cases and ancillary services so we can approach it in a business-like manner as opposed to hoping, which is not an engineering method. Thank you.

COUNCILMAN LORENZEN: Thank you very much.

Next group, Jeff Hammarlund, Johnny Casana. Sorry, I could not read the next name but it has a couple of Z's in it and you probably know -- it's Power Past Coal, representing Power Past Coal, and Kris Nelson, please.

MS. MEDALION: What's the name you can't pronounce?

COUNCILMAN LORENZEN: It's --

MS. MEDALION: Is it T-a-i-z-z?

COUNCILMAN LORENZEN: What is it?

MS. MEDALION: Is it T-a-i-z-z?

COUNCILMAN LORENZEN: Yes, that is it.

MS. MEDALION: Okay. All right.

COUNCILMAN LORENZEN: It's not pronouncing it, I'm having difficulty reading it.

MS. MEDALION: I'm used to that. No worries.

COUNCILMAN LORENZEN: I'm having difficulty reading it. I'm sorry. Jeff?

PROFESSOR HAMMARLUND: Yes.

COUNCILMAN LORENZEN: Go ahead.

PROFESSOR HAMMARLUND: Well, we're getting into 8:15, things are moving along here. But I wanted to -- I'm going to start with an admission. I was sitting there next to my friend Mark over there and I have an admission to make. I think I am a Council junkie. Now, there's no AA program -- AA program or Al-Anon program that I'm aware of for this. And so probably that's just as well because I like being a Council junkie.

I'm realizing this is the Seventh Power Plan -- I have testified on six of those seven power plans. First one, I did not testify because I was a senior manager at Southern California Edison, so I

was unable to, but it's a fascinating process and I'm glad to be here once again. This may be my last time. I'm planning to retire at the end of this academic year, but you never know.

The other reason I think I'm a Council junkie is I had the great honor, when I was a young man, of working for the U.S. Senate Energy Natural Resources Committee, when the committee was developing the Northwest Power Act. That was, in fact, my PhD dissertation and they hired me to work on their staff. And Senator Jackson, the Chairman, basically said, your job, Jeff, is to make sure the northwest members of our committee are taken care of in this legislation.

So I've always been a -- let's call it a rooter of the Council when you guys do a great job. I'm in there cheering. When you mess up every once in a while, I wince just a little bit, but I feel a sense of pride that I got to work on a legislation. By the way, this legislation, Senator Hatfield has told me several times was his -- in his opinion, one of his crowning achievements was the work he did on the Power Act, including creation of the Northwest Power Conservation Council and defining energy efficiency as a resource. Very important.

Well, so since -- I'll be honest with you, I think this Plan does have some excellent features and I could spend some time talking about them, but I think it's better use of my little bit of time I have left here to talk about the things that I think need to be improved.

It does a remarkable job on energy efficiency, of course, as always, Tom Eckman is one of my heroes. Recognizing demand response to a much greater extent than before, but my opinion is there's still a lot of work to do before this Plan reaches its potential. And I'm a little concerned, I think we may not be able to get there, everything we want in this Plan, but I think we need to at least tee up for the next one.

And why do I say this? Well, first of all, the smart grid which was discussed in quite a bit of detail, it had a whole appendix associated with it in the previous plans, the Sixth Plan, it's virtually ignored in this Plan. There's a few comments here and there about the smart grid. I've been teaching courses on the northwest energy policy at Portland State University for 22 years. The last seven years I've been teaching courses on the smart grid, demand response, energy storage, and

distributed generation and those sorts of things, and I was disappointed not to see much about the smart grid.

The smart grid in my opinion can boost a lot of demand response, DSM efforts, in ways that make them much more effective, more powerful and more efficient. And the careful deployment of the smart grid technology is going to help the northwest power system achieve a whole host of benefits. I won't read them now but they're going to be in the testimony I send you, but a whole bunch of benefits. And I think that's virtually ignored and I think that's unfortunate.

Secondly, the Plan does a very good job of introducing demand responses role in reducing both winter and summer peak. And it also briefly introduces some of the other benefits that demand response can offer. But then inexplicably to me, it almost ignores them throughout the rest of the Plan. The Plan in my opinion needs a much broader designation of demand response, such as the one that FERC has developed. One that does not relegate demand response just in times when the power system is under stress, as the Council's definition does.

We need a definition in my opinion that

anticipates coordinated actions between both power systems and distributed resources that can provide enhanced power systems flexibility and grid stability, that include new ways to addressing additional ancillary services, such as contingency reserves, regulation and load following.

I forgot to mention, we had a public forum at the end of our smart grid two term class and I was so honored that Council Member Smith came all the way from Montana, along with one of his staff members, and Bill Bradbury participated by phone from three airports, an amazing, amazing job. But that was -- those are the sorts of things that we were exploring, as you recall, Council members, in that course.

We need a definition of demand response, I think, that integrates the -- that looks at the integration and applies the full value of intermittent, renewable resources, economically and efficiently. I think that was one of the points that Cameron made. And we -- we need a definition of demand response that offers a more effective and politically acceptable ways to respond to future oversupply events. Smart Grid Northwest has proposed what I think is a very good definition in

their comments, and I encourage you to take a look at that.

Now -- well, it may be true that the entire region may not be ready for price-responsive demand response. There was a time when the region really wasn't ready for energy efficiency. I was working for -- I was Senior Policy Analyst at the Public Power Council at that time. I testified on behalf of PPC about that. But you know what, the Council said, you know, we need energy efficiency.

Actually, it's right there in the Act, it's number one, and we are going to go out and get it. The region -- and it gave the region the kind of push it needed to take on energy efficiency, frankly, with some resistance from the utilities, but most of the utilities have come around and I think that's a great thing.

I am hoping that the same sort of thing can happen here with demand response. When we've looked at the energy efficiency programs, the model conservation standards and so on, we developed, and Council played a very key role in this. Early adoptive programs, various programs to test various approaches, to encourage that to happen, and I'd like to encourage Council and Bonneville and other

parties to take a look at those programs. Which ones worked, what didn't work, what can be enhanced, what can we borrow from those, what lessons can we learn.

Third, the renewable issue of -- Cameron covered that and Wendy, so I won't go over that again, the things to be addressed capacity issue, renewables.

Fourth, until recently the Council and the region, very correctly, seemed to interpret the Act's focus on power systems reliability to meet adequacy of generation. Right. The Draft Plan correctly has concerns about peak demand to that equation. But the scope of the power system reliability in my opinion needs to be expanded even further. The Council and the region need to explore how distributed generation, energy storage, micro-grids, data platforms and other DSM tools can help address grid and power system resiliency in the event of a natural or human-caused disaster.

Rick Williams' comments about the 9.0 earthquake is a great example. But, you know, we could even have terrorist attacks and other things around here too. We need to look at resiliency in the power system as one of the key parts of the

power planning process. In my opinion, to ignore what we know now about the potential for a major earthquake and the likely implications is simply irresponsible. Disaster planning and power system including resiliency need to be addressed in the Plan and we can't wait until the eighth plan to do that.

Finally, the electric utility industry is going through a period of momentous change. We read about this all the time. The utility of the future, et cetera, et cetera. The problem is none of us know when that change is going to be. And it's a very difficult time for Council staff or the Council members to come up with a plan that assumes much of anything about the future 20 years down the road. And yet that's your charge. That is your charge and in my opinion, there could be a lot more work.

Maybe it all has to be in the next plan and looking up multiple scenarios that are very distinctly different, because I don't think this Plan yet has -- is reflecting all of the interesting thinking about the utility of the future that's out there. It's -- it's -- in my opinion, it's still seeped pretty much what I saw in the Sixth Plan and I think the Eighth Plan and the Ninth Plan are going

to look so much different than the Seventh Plan.

I expect -- I would encourage Council staff and members to at least think about some of those, you know, possibilities out there with storage and with electric vehicles, and so on, beyond what you've done so far. That's enough.

COUNCILMAN LORENZEN: Thank you very much.

Johnny.

MR. CASANA: I love that passionate testimony late in the evening. You guys have a lot groupies? I'm sure you can get an autograph later.

PROFESSOR HAMMARLUND: Can I get an autograph?

MR. CASANA: Hi, my name is Johnny Casana. I represent EDP Renewables. We're one of the world's largest wind energy companies. We've been in the northwest for about 15 years. We have a base here in Portland. We have several hundred megawatts of operating assets. And I'd like to echo, also, some of the great work that we've seen. An immense amount of work has gone into this Plan and a lot of parts are done really well. Energy efficiency, demand response, I think are great improvements on what we've seen before and what allowed those efforts.

I would also like to echo some of the concerns we have about renewable energy assumptions that went into the modeling. I believe that some of them have been -- some of the key assumptions were overly conservative in terms of what renewable technology, modern technology can provide in terms of reliability, capacity and even some of those peak loads in the wintertime. And I'd like to speak a little bit about the idea that Cameron from Renewable Northwest raised about a low-carbon grid study. There was a version of this idea.

It was executed in California about 18 months ago by the National Renewable Lab. I sat on the steering committee for that effort and the results of that were very influential for lawmakers in California. The other Governor Brown cited it as one of the key influences in his decision to pursue 50 percent RPS, that could be done cost effectively and reliably, not through the heroic assumptions in new technologies or some sort of black box of something that it doesn't exist yet.

But through managing the technologies that we have in a system that we have in -- towards abundance rather than towards compliance. And this was one of the key ideas of the low-carbon study was

flipping the script not from overlaying or sort of layering on a little bit of renewables that's variable and trying to squeeze it into the system and still ask the rest of the system to operate conventionally and do all of the work, even if it's only 75 or 70 percent of the system.

But instead, as renewables move from the edge of the system towards the middle, actually, ask them to do the work of the system also and that means providing capacity and providing the flexibility in ways that look different than conventional flexibility that's carbon intensive, but matter greatly when what you're looking at is not compliance, but cover reduction.

Because the source of your flexibility affects the rest of the energy on the system and there's ways that you can utilize your demand response and energy efficiency, regional coordination, flexible load with -- and ask for the sorts of inertia and capacity and voltage drive that you can get from wind turbines and solar panels with the right kind of inverters that -- that modern renewable technology can provide but is not asked to.

And in that regard one of the things that

we would recommend is that for the final version of the Seventh Plan, some of those assumptions about the role that renewables can play in the system be forward thinking rather than backward thinking.

We do think that there is some work that can be done on tweaking the assumptions, and like it's been mentioned earlier tonight, the assumptions are the baseline for the rest of everything that happens. And getting them right affects what you're telling everyone what you think we can do. And we think we can do more. Thank you.

COUNCILMAN LORENZEN: Very good. Thank you. Next.

MS. MEDALLION: Hi, my name Taizz Medalion. I live in north Portland overlooking Swan Island. And thanks very much for taking comments on the great work that Council is doing and will hopefully continue to do. 30 years as a respiratory therapist has made me aware of the terrible toll that burning fossil fuels has taken on our health. The health cost from the pit to the grid are often disproportionately borne by the most vulnerable among us. Since one-third of the energy in Oregon comes from coal, it seems like the right time and place to start transitioning from coal to clean

energy. We need policy solutions to fix this.

A nonpartisan survey found that 71 percent of Oregonians support clean energy solutions. Political will leads to economic response. 1,000 megawatts are waiting to come online and removing coal from our electricity mix could open up room for those job-creating, clean energy projects. There are 5,000 long-term jobs Oregon created and DOE data supports that even a fraction of Oregon solar and wind resources could provide electricity for all Oregonians with excess to sell to other states.

Transitioning from coal to clean energy would improve our air quality, lead to local job creation and protection of our life-sustaining planet. Thanks very much.

COUNCILMAN LORENZEN: Thank you. Kris.

MR. NELSON: Thank you Chair and members of the Council, staff. I am Kris Nelson. I'm principal of the Phoenix Finance here in Portland, and over the decades, I've been involved in renewable energy consulting, development and writing. And more recently, I've been involved in assisting in the development of a few advanced renewable energy technologies. So I'd like to address a couple of points regarding that topic in

the Plan.

I applaud your comprehensive scope of the Draft Plan and its inclusion of minor renewable energy technologies, and specifically on the local level. But I believe the Plan could be improved by further discussion of the cost and benefits of an under-utilized renewable technology in the region, and that is namely anaerobic digestion.

And the reason I say this is because, frankly, it's one of those sleeper technologies in not only the northwest, but also, nationwide. As you may know, the leaders of this technology in the world are in Europe and it's only been recently that some of this leading-edge technology has filtered its way into the U.S., and just barely introduced itself to the northwest.

So over the last approximately two and a half years, I've been assisting in the development of a company based in Boise that has patented several aspects of advanced digestion technology. A couple of the important features of this technology is that, one, it is extremely efficient, and namely it uses a three-stage process instead of a conventional one- or two-stage process. And two, it actually has a capacity to use carbon dioxide as a

source of fuel. So not only does it have carbon dioxide offset benefits as a renewable energy technology, but it also has capacity to incorporate emissions of CO2 in its production.

So in light of this, I think it would be warranted to explore based on a report that the Climate Trust conducted two or three years ago on the generating capacity of anaerobic digestion in Oregon. And as I recall, it concluded that approximately 12 megawatts of capacity would be available in Oregon using, frankly, your conventional anaerobic digestion technology.

However, with capacity of Oregon using an advanced technology that could be increased, I think, substantially. So if we were to just take a back-of-the-envelope forecast and say, well, maybe there would be a minimum of, you know, 50 megawatts of renewable energy capacity available in the four northwest states through additional anaerobic digestion applications.

And so I think secondly, my main point here tonight is that with this kind of realization and in light of this capacity, I think that with the carbon offset benefits of anaerobic digestion, that reassessing the costs and benefits of maintaining

the four lower Snake dams would also be warranted. Especially if this is considered in light of the total mix.

So with that, thank you very much for your hard and good work and listening here tonight. Keep up the good work.

COUNCILMAN LORENZEN: Thank you, Kris. Thanks everyone.

Last but not least, Bill Eddie. Is he here? Bill, you get the final word.

MR. EDDIE: I appreciate the opportunity to comment. I do want to echo -- introduce myself first. Bill Eddie, I am the President of One Energy Renewables. We're a renewable energy developer focused on solar. Based here in the northwest, with an office in Seattle and Portland. Growing fast in our work around the country developing solar projects. We have a project three megawatts, you'll see on the way to the coast from here to Lincoln City, just -- just now operating.

I want to echo the comments of Renewable Northwest -- Cameron from Renewable Northwest and Wendy from Northwest Energy Coalition. I appreciate what the Council has done over all these years on energy efficiency. Truly have been a thought leader

on energy efficiency around the country. And my challenge is to become a thought leader on the integration of renewables into a flexible, low-carbon grid.

I really want to endorse the idea of the Council's playing an active role in facilitating a low-carbon grid study. It would be key to have in this region where we're not -- we are at the moment where we need to actively integrate renewables into the grid on the same basis as other resources and treat them like we treat all the other resources in terms of their role in the future.

My particular comment on the Plan and some of the analysis it underlies, it is -- some of it happens, I see all around the country with utility planning, which is an overestimation of cost and underestimation of deployment of renewables. If you were sitting here, which you may have been, five years ago, would you have thought there would be 10,000 megawatts of solar in California? There are 10,000 megawatts of solar in California.

The current cost estimates in this Plan, this Draft Plan for solar have a capital cost estimate of $2,400 per kilowatt AC for solar. If someone bid that price into our project today, they

would come in last. That contractor would lose every time. These prices for solar in the range $500 to $1,000 per kilowatt AC are too high for today. Not in 2020, not next year, today.

And it's a missed chance to be great, but it's also a missed chance to do what's right for the region, and right for the climate. So my challenge is to get the renewables piece right, focus on it. Actively put the Council's intellectual heft into a low-carbon grid study. Again, I appreciate the chance to speak. Thank you.

COUNCILMAN LORENZEN: Thank you very much. It's always -- I don't quite know what will happen, but if anyone who has not yet signed up wishes to testify, you can sign up right now and do so. But -- going once, twice, three times. So we're -- it's too late.

And -- but thank you all for coming tonight. We appreciate it very much. Your comments are very helpful and will certainly be taken into consideration. And have a good evening and safe travels home.

(Whereupon, hearing concluded at 8:37 p.m.)

CERTIFICATE

I, Kimberly R. McLain, do hereby certify that I reported all proceedings adduced in the foregoing matter and that the foregoing transcript pages constitutes a full, true and accurate record of said proceedings to the best of my ability.

I further certify that I am neither related to counsel or any party to the proceedings nor have any interest in the outcome of the proceedings.

IN WITNESS HEREOF, I have hereunto set my hand this 24th day of December, 2015.

Kimberly R. McLain

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