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PACIFIC NORTHWEST DROUGHT MANAGEMENT AND ENERGY AVAILABILITY

OVERSIGHT FIELD HEARING

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER

OF THE

COMMITTEE ON RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTH CONGRESS

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OVERSIGHT FIELD HEARING ON PACIFIC NORTHWEST DROUGHT MANAGEMENT AND ENERGY AVAILABILITY

Saturday, May 19, 2001

U.S. House of Representatives

Subcommittee on Water and Power

Committee on Resources

Tacoma, Washington

The Subcommittee met, pursuant to call, at 9 a.m., at the City Council Chambers, 1st Floor of the Tacoma Municipal Building, 747 Market Street, Tacoma, Washington, Hon. Ken Calvert presiding.

STATEMENT OF HON. KEN CALVERT, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. CALVERT. Good morning. Thank you for attending this Subcommittee hearing this morning.

First I'd like to thank all of you for having me here in this beautiful area of Tacoma, Washington. I love the Pacific Northwest. It's a delightful place to visit. And certainly, my good friend, Adam Smith, has a wonderful place to represent. This region is a very special place.

Our Subcommittee is in a unique position in this Congress to take action on two issues that have dominated media headlines this year and, I suspect, will continue to dominate headlines throughout the country. That's energy and water. Keeping the lights on this summer and in the future is imperative as is water for business, homes, crops, and fish. We must carefully plan to maximize the use of our limited resources. We cannot continue to talk about managing water resources and power resources as two separate areas.

The Northwest is suffering from the second-worst drought in its history. This drought affects all users of water, including businesses, residents, farmers, fish, power users who depend on water for electricity.

We are here today to accomplish two objectives. First, to evaluate the impacts of drought in the Pacific Northwest. The second, to explore possible solutions for the current crisis on Northwest utilities and their customers.

As many of you are aware, our jurisdiction includes the Bureau of Reclamation and the power market administrations, including the Bonneville Power Administration.

This hearing will focus on issues pertaining to our jurisdiction. Supposedly, we're not going to focus on matters outside of our jurisdiction such as price caps, although I think that will probably be brought up.

I hope our witnesses and members will respect our jurisdiction and comment on matters that will be forwarded to us later this year.

I look forward to hearing from the witnesses on why the region faces the problems before us today. In addition, I would like to have the witnesses share with us what policies over the next 10 years—over the last 10 years, I should say—have led to the problems that the region is facing today.

Responsible planning for the future means assuring adequate, reliable supplies of both water and power, even in drought years.

We're here to search out reasonable solutions to the current situation. And I certainly look forward to hearing from the witnesses.

With that, I would like to recognize Mr. Smith, the ranking democratic member, for any statement he may have.

STATEMENT OF HON. ADAM SMITH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

Mr. SMITH. Thank you, Mr. Chairman.

First of all, I really want to thank Chairman Calvert for holding this hearing out—well, not technically in my district—close enough to my district—and certainly in the Pacific Northwest.

And I think one of the biggest goals I have from this hearing is to draw attention to the nature of the problem in the Pacific Northwest.

One of my frustrations—and I'm sure it's a frustration for my colleagues from the region—nationwide, people don't really seem to be aware of the full extent of the problem we're having with our electricity and energy crisis in the Pacific Northwest.

To the extent they are aware of it at all, they are aware that it's a problem in California. That's about it. Most of us here know it's a huge problem in the Pacific Northwest.

In essence, the pricing of our energy has gone up ten- and twentyfold over the last 18 months, just an incredible increase in expense. And that is combined with the drought situation to really put us in a situation that could—has already cost us jobs and could have a major negative impact on our economy.

There are things that we can do to deal with this. And I hope that out of this hearing, we will get some information on how to step forward and help to improve the situation.

Just for one example, transmission has become a major issue. We're not able to get the power that we have where we need it. What can we do to improve that situation?

We really need to have a full-scale, 100 percent focus on the energy crisis that is facing the Pacific Northwest as well as the West Coast in general.

I'm hopeful that out of this hearing, we will learn more about the situation and draw more attention to it and, hopefully, get policy

makers at FERC and in Congress to step up to the problem and start coming up with solutions. We cannot afford to have power at the price it is currently at for too much longer. The impact on the economy would be devastating.

So I'm hoping we will learn a great deal at this hearing and also get some of the attention we need to push policy makers to make the decisions that need to be made to help us deal with this crisis. It is the No. 1 issue.

I—in my career, I have not seen an issue go from being something people weren't even concerned about to being the top issue as quickly as this one has. Literally 2 years ago, nobody was talking about it; right now, it's the No. 1 issue in the region. It affects jobs; it affects consumers. It dramatically affects the overall economy. So I hope we will focus—give it the focus and attention that it deserves, which our constituents out here desperately need us to do.

With that, I will thank Mr. Calvert.

Mr. CALVERT. Thank you.

Gentlemen, any brief open statements before we recognize the panel?

Mr. DeFazio?

STATEMENT OF HON. PETER A. DeFAZIO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON

Mr. DEFAZIO. Thank you, Mr. Chairman.

Mr. Chairman, I'd say there are two things that bring us here. One is an act of God, which is the drought—although it may be human related due to global warming. We don't really know—but secondly, an act of Congress.

In the 1992 Energy Act—I was a conferee on that act. I was one of two conferees to oppose the legislation and one of a very few members of the House to oppose the legislation which provided the authorization for deregulation of wholesale generation and transmission and deregulation of state retail electricity. It was a mistake at the time, and I told people it was a mistake; it would never work; it is nonsensical.

The most reliable, most affordable energy in the entire capitalist, industrial world, and now we have a system in the West that more resembles that of India or some other, impoverished, struggling, developing nation, all because of the '92 act.

The '92 Act caused BPA to abandon conservation and renewables. The then administrator said he couldn't afford them because of coming deregulation. The deregulation is what led to the lack of investment in generation because of the uncertainties created in the market. And the deregulation has led to a power crisis that nobody can afford.

So, I'm hopeful that the Committee will exert, substantially, its jurisdiction in these areas to review deregulation and review the looming deregulation of transmission because, quite frankly, the way that the Federal Energy Regulatory Commission is heading with their mandate for a West-wide RTO or a Northwest RTO will create a California every day on the transmission system for five to 7 years until we clean up the 40 congestion points already identified. We don't need a market to tell us where the choke points

are in the transmission system. An engineer can tell us where they are. We know where they are. And if we deregulate that transmission with a market-based mechanism, which is being advocated by FERC, with a substantial end of the jurisdiction with this Committee for the Federal components without first upgrading it, we will be causing worse devastation in the power market than has already been caused.

And I don't like what I see now, because we've set Northwesterners one against another because we're all trying to get in a lifeboat here, and we don't need to be getting into a lifeboat.

Yes, the drought is a problem, but if wholesale power were affordable, we could get through it without anywhere near the pain we're seeing.

I hope, Mr. Chairman, that we do exert our authority. This is just a kick-off hearing for further investigation of these matters.

Thank you.

Mr. CALVERT. Thank you.

Mr. Larsen?

STATEMENT OF HON. RICK LARSEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

Mr. LARSEN. Mr. Chairman, thank you very much for being willing to hold this field hearing here in the Northwest to talk about an issue that's very important to us.

I want to thank the ranking member, Adam Smith, as well for his efforts, and welcome Mr. DeFazio, as well, to Washington state.

I represent Washington state's second district, which is in the Northwest corner of the state. And in many ways, the district is a microcosm of the—the lifeboat that Mr. DeFazio mentioned.

I have an aluminum company, a DSI; I have the largest public utility in the state, in my district; a large private utility; and a rural electrical co-op, all struggling under the crisis that we face here in the Northwest.

It's been said that this crisis is sort of our "perfect storm" of energy, seemingly impossible events happening seemingly impossibly at the same time: the drought, increased demand, and deregulation efforts in California, all contributing to what we're facing here in the Northwest.

And 7 percent of the country's electricity is generated by hydropower; 75 percent or so of Washington state's electricity is generated by hydropower, so we are very dependent on what happens in our skies in terms of rain.

Energy is the basis of our economic engine. So what we face here now is uncertainty and uncertainty even for our utilities.

This morning in the local paper, there is an article about Snohomish County PUD, which is the largest public utility in the state. The headline questions cloud—PUD's planning; the evolving energy crisis makes it hard for Snohomish County's utilities to look ahead. That uncertainty only adds uncertainty to the rate payers and homeowners in the Northwest. And we certainly need to take a hard look at what kinds of actions that we can take in Congress to ensure that we bring certainty back to a very uncertain market.

Thank you very much, Chairman Calvert, for holding this field hearing here in the Northwest. I appreciate the attention that you're providing this issue.

Mr. CALVERT. Thank you, gentlemen.

Our first panel member this morning is Mr. Stephen Wright, the Acting Administrator for the Bonneville Power Administration. He's accompanied by Mr. Kenneth Pedde, the Acting Pacific Northwest Regional Director, Bureau of Reclamation; and General Carl A. Strock, U.S. Army Commander Division Engineer, U.S. Corps of Engineers.

Welcome, gentlemen.

Mr. Wright, you can begin.

We have a series of lights. We attempt to keep our testimony down to 5 minutes, so we often have plenty of time for questions.

With that, you may begin your testimony.

STATEMENT OF STEPHEN WRIGHT, ACTING ADMINISTRATOR, BONNEVILLE POWER ADMINISTRATION, ACCOMPANIED BY KENNETH PEDDE, ACTING PACIFIC NORTHWEST REGIONAL DIRECTOR, BUREAU OF RECLAMATION; AND CARL A. STROCK, GENERAL, U.S. ARMY COMMANDER DIVISION ENGINEER, U.S. CORPS OF ENGINEERS

Mr. WRIGHT. Thank you. I will talk very quickly, to make sure that I use all of my 5 minutes wisely.

Thank you for the opportunity to appear today, Mr. Chairman. I appreciate the fact you have taken the time to come out here.

While the nation's attention has been focused on California, the Northwest is also facing a severe energy crisis that threatens both our economy and our environment.

We as a region are heavily dependent on low-cost electricity. Sixty percent of the electricity in this region is produced by hydropower. The national average is only 15 percent.

So, we depend a great deal on hydropower, and consequently, the problems that we confront are as a result of that dependence.

We have a lack of supply, due to increasing demand. We have a near-record drought, the second worst water year in 70 years of record. And also we have, the troubled transition to deregulation in California, causing problems for us as well. All of these factors put together have created a calamity for the Pacific Northwest.

If I could, I would like to describe three time-frames for you: near term, mid term, and long term.

In the near term, the situation is dominated by issues associated with the drought. High wholesale prices, along with the second-worst water year on record have created incredible electricity prices and difficulty in meeting our loads.

Normally, we count on imports from California in a situation like this. Because of the troubled transition to deregulation in California, we have not had those supplies available to us, or when they are available, they're available at incredibly high prices.

In order to deal with this, we have initiated a set of extraordinary measures to make sure that we can keep the lights on in the Northwest and reduce our costs. We have bought down industrial and agricultural loads. As a result we have reduced loads by

more than 2,000 megawatts. In addition, the entire aluminum industry in this region will not operate this summer.

We have also bought out more than 100,000 acres of irrigated land in the central part of Washington.

In addition we have authority in the biological opinion, to declare a power emergency and run the hydrosystem harder. I have done that, four times, in January, February, and again starting on April 3rd.

And we continue to operate in a power system emergency today. The authority under the biological opinion allows us to increase energy supply, but it does hurt our efforts to recover salmon.

We have, in addition, accelerated conservation programs in the region. Our belief is that these measures have kept the lights on in the region. Absent those activities, we don't believe we could have met the loads.

We have also created financial stability for the agency so that we can cover our costs and repay the investments that the U.S. taxpayers have in the Northwest hydro system.

In the mid term, we are confronted with a significant problem: the size of our rate increase next year. Our current rates end on September 30th. New rates that go into effect on October 1.

We have new power sales contracts that go into effect on that day as well, so we cannot just roll over the rates because the new contracts have new products and services.

The contracts that we signed last year, taking effect on October 1, reflect 11,000 megawatts of load. We have only 8,000 megawatts of resources.

Under the Northwest Power Act, we have an obligation to serve. Those who want to place their load on Bonneville have a right to do so, and we are required to purchase the power to serve that load.

In today's market, purchasing that power would cost more than $4 billion. We are a $2.2-billion-dollar-a-year operation. Consequently, what we are looking at is the potential for a 250 percent rate increase.

We have sought to learn from the problems in California to address our problems. Number one, we're trying to get out of the wholesale power market so that we do not have to purchase the $4 billion worth of energy.

If, however, we are unsuccessful with that, our view is that we must raise the rates. And the reason for that is, because what we saw in California was when the rates were outrageous, it created a credit problem. And when you start with a fundamental supply-and-demand problem and then you throw a credit problem on top of that, what you tend to do is take supply out of the market, which drives the prices even higher.

So, our view is we are going to do everything we can to get out of the wholesale market. But if we are unsuccessful, we will then raise the rates.

We have embarked on a program focused on the following principles. We've asked our utility customers to reduce their loads by 10 percent. We've asked our direct service industrial customers who could not operate profitably with a 250 percent rate increase to shut down for up to 2 years. We would pay the companies to pay

their workers, helping to assure that those folks would not be working would not be harmed by this. Moreover, we sought to lessen the impact on local communities. If workers are paid, they have money in their pockets to buy gas and groceries. And the secondary impact to communities should be lessened.

We're having excellent discussions with all of our customer groups. We expect this to be difficult, but we expect it to be successful. In that regard, we announced this week our first major agreement with ALCOA. They have agreed to shut down for up to 2 years at a price where their workers will be paid for the entire time that they are shut down. In addition, they agreed to continue to pay their state and local taxes, which should lessen the impact on the community.

For the long term, again, the fundamental problem is supply and demand. However, we have a good signal concerning what's going on in this region. Bonneville, as the major transmission provider in the region, is now seeing 28,000 megawatts of potential resources developed in this region. We will probably need 3,000 to 5,000 megawatts. Not all of that 28,000 megawatts is real, but we are going in the right direction.

In addition, we have more than 2,000 megawatts on-line next winter that was not on-line this year. And if our load reduction effort succeeds in taking an additional 2,000 megawatts of demand away, we have potentially brought supply and demand into greater balance by 4,000 megawatts.

We have seen some softening in long-term wholesale price markets just in the last couple of weeks. That's a good signal. We think it's a result of what's going on in the generation and demand markets.

We need infrastructure. We need generation. We need transmission. We need conservation. We need gas pipeline capacity and storage.

In conclusion, we are faced with enormous problems that will impact both people and fish in this region. We think that by working together we can reduce the size of those impacts.

I've been impressed by the willingness of the people in the Northwest to work together in this time of crisis. We've had a tremendous amount of support for the efforts that we have undertaken. I see light at the end of the tunnel, but unfortunately, it is going to take some time.

Mr. Chairman, thank you. I also want to make certain it's understood that we operate the Federal power system in conjunction with our partners, the Bureau of Reclamation, and the Corps of Engineers. We're happy to answer any questions that the panel may have.

Mr. CALVERT. Thank you.

[The prepared statement of Mr. Wright follows:]

Statement of Stephen J. Wright, Acting Administrator and Chief Executive Officer, Bonneville Power Administration, U.S. Department of Energy

Mr. Chairman, distinguished members of the Subcommittee, my name is Stephen J. Wright. I am the Acting Administrator and Chief Executive Officer, Bonneville Power Administration (Bonneville). We appreciate this opportunity to appear today and we thank the Subcommittee for its attention to the challenges facing the West Coast electricity market.

Mr. Chairman, the Pacific Northwest is weathering an energy crisis of significant magnitude. The combination of near-record low streamflows in the Columbia River Basin, extraordinarily high and volatile wholesale electricity prices and an extremely tight West Coast power supply has severely challenged Bonneville's ability to meet its public responsibilities. Bonneville expects to meet demand this summer, but the persistent drought could affect our ability in the longer term.

More broadly, Bonneville is very concerned about the impact of the West Coast energy crisis on the Pacific Northwest economy, power system reliability, recovery of endangered fish and on our own financial health. Virtually all of our focus now is in managing through this crisis with a set of near-term and longer-term actions designed to mitigate the impact of the West Coast energy crisis on Northwest citizens and businesses and fish. There are no easy answers here, and tradeoffs must be made in the near term.

My testimony today will focus on the challenges we are facing and, in particular, what we are doing to address them. Our belief is that we will be successful in dealing with these challenges to the extent that we anticipate them, address them creatively and address them head-on, and work closely with other regional stakeholders to put solutions into place. Bonneville is in the process of a formal, on-the-record hearing to establish rates, so any comments I may make today concerning Bonneville's rates must be very limited and based on the hearing's evidentiary record.

- In the near term, through the summer and into this coming winter, our biggest challenge is preserving power system reliability and Bonneville's financial health, while meeting our fish enhancement responsibilities.
- At the same time, we are seeking to reduce the amount of power we must purchase in this expensive wholesale market for the next two years. Bonneville is facing a significant increase in our load serving obligations beginning October 1, 2001, and purchasing power in this market could lead to a significant Bonneville rate increase.
- Longer term over the next two to four years we support developing new energy infrastructure, including expanding the transmission system, bringing on new generation from both conventional and renewable sources, and more conservation. The fundamental driver in the West Coast energy crisis is the gap between demand and supply. Once the Pacific Northwest has new sources of supply, increased conservation, and much-needed transmission enhancements, Bonneville believes we can expect relief from these sky-high electricity prices.

NEAR TERM: GETTING THROUGH THE DROUGHT AND PRESERVING RELIABILITY AND FINANCIAL STABILITY

As members of this Subcommittee, you are familiar with the convergence of conditions that led to the West Coast energy crisis increasing demand, inadequate resource development and transmission infrastructure investment, and California's restructuring. In addition, the Northwest is experiencing one of the worst droughts on record, which has severely limited the amount of water available for hydroelectric generation. Hydro resources provide about 60 percent of the power in the Northwest.

For decades, Bonneville has imported power from California during the winter months when Northwest electricity demand tends to be highest. But this year, far from being able to help the Northwest, California came looking for additional power from us to help it cope with its frequent power emergencies. With a lack of available supply, Bonneville was forced to declare brief power system emergencies on three occasions this winter and an extended emergency again this spring.

In one way we were fortunate; the winter was mild, with none of the prolonged cold snaps that have historically threatened Northwest power system reliability. But Bonneville still had to take a series of extraordinary actions in order to keep the lights on.

Reducing Demand and Buying Power: In order to reduce electric load and conserve water, since December Bonneville has purchased or curtailed over 3,600 megawatt-months of energy at a cost of over $500 million. In addition, we netted about 500 megawatt-months of imports from California with two-for-one energy exchanges. These exchanges were a classic win-win solution because for every megawatt we sent south during California's peak-demand hours, they returned two megawatts (MW) off-peak. Our reservoir levels are actually higher than they would have been without the exchange. At the same time, California received the energy when it needed it most'during peak demand hours and was able to return it during "light load hours" when it actually had excess power.

We instituted several major new conservation and renewable energy programs, and we accelerated the start date for others. Collectively, we expect these initiatives to yield 215 average megawatts (aMW) of energy savings by 2006.

We are also operating a Demand Exchange program, which makes over 525 aMW of voluntary load curtailment available to us from our large end-use consumers and large retail loads of our utility customers during times of high-market power prices and peak-load demand. Finally working with irrigation districts and the Bureau of Reclamation (Reclamation), we have arranged irrigation water buybacks that are leaving over 400,000 acre-feet of precious water back in the river this year, and are saving or producing over 600 megawatt-months of energy this year.

Emergency Hydropower Operations: Despite poor water conditions, we must manage hydropower operations through the rest of the year to assure we can pay our bills and maintain system reliability. The National Marine Fisheries Service (NMFS) 2000 Biological Opinion (BiOp) acknowledges that there may not always be enough water to meet the normal operation for optimal fish support and still have enough power generation at the right times. When this occurs, Bonneville is expected to purchase power in the wholesale market to supplement regional supply. However, the BiOp also anticipated that there could be circumstances when the power grid would require extraordinary support and acknowledged that at such times there would be curtailments in flow and spill operations designed to improve fish survival.

Because this year is turning out to have extended periods of such circumstances, Bonneville has taken the initiative, along with the other Federal action agencies of the Federal Columbia River Power System (FCRPS) and with input from the Northwest states and tribes, to craft a set of emergency operating principles and an operating plan. We have agreed with NMFS and the other Federal agencies on reliability and financial criteria for declaring a power emergency.

The financial criteria are important because the Federal hydropower system provides a multitude of long-term benefits to the region. It is one of the economic engines of the region as well as the greatest source of financing for salmon recovery over the long run. These benefits would be put at risk if we are unable to cover our costs.

Our goal is to end this fiscal year with cash reserves sufficient to handle an anticipated sharp draw for power purchases in the first quarter of the next fiscal year (October - December 2001), before the winter rains can replenish stream flows after a summer drought. The California situation reinforces the importance of staying current with costs to assure creditworthiness and, ultimately, electric system reliability.

It is important to reaffirm here that Bonneville supports the BiOp. The variations in this year's hydro operations are short term. The Federal action agencies are proceeding with development of long-term implementation plans, as the BiOp contemplates. Bonneville has also committed to providing funds to help offset the impacts of this year's emergency operations. We have issued a solicitation for projects that will 1) result in more water in the system; 2) remove more power load from the system; or 3) directly increase returning adult fish or increase juvenile survival.

A California Strategy: Our struggle to meet power and fish needs this summer will be complicated if California has problems meeting load, as seems more than likely. Any help we are able to provide California must be carefully managed so as to not compromise the Northwest situation.

We are working toward getting an agreement with California, before serious problems start, to provide California assistance without impairing Bonneville and Northwest reliability, fish enhancement, or finances. Since the FCRPS is critically short on water, Bonneville must continue to rely on energy exchanges with California as we have this past winter.

Regional Emergency Response Team: Last fall, Northwest utilities, agencies, and states independently formed an Emergency Response Team (ERT). The ERT is working effectively to anticipate potential power shortages, develop consistent public messages and alerts, and plan concerted efforts to mitigate and manage shortages that might occur.

California's system of calling for voluntary actions by consumers when falling reserve levels trigger a power system emergency has routinely produced a response of less than a two percent load reduction. In light of this, the ERT has proposed an organized, informed and pledged curtailment system that might produce a 10–20 percent voluntary reduction in demand over a few peak hours in a day that would otherwise see rotating blackouts. The proposal is under active consideration.

REDUCE MARKET PURCHASES TO MINIMIZE RATE INCREASE

Bonneville is also facing significantly increased load serving obligations in the next rate period (fiscal years 2002 though 2006) beginning October 1, 2001. The price differential between the market and Bonneville power rates led our customers to increase their purchases from us in the next rate period. When we finalized our power sales contracts, Bonneville's contractual obligations added up to approximately 11,000 aMW about 3,000 aMW more than our existing firm resources. Unless these obligations are reduced, we must purchase as much as 3,000 aMW in the wholesale market.

Bonneville has already made some favorably-priced power purchases to meet this need for the next rate period. We will also benefit from some of the conservation efforts I have mentioned that are now going into place or will be in place within the next couple of years.

The cost of the remaining market purchases, though, could drive Bonneville's rates up in the first year of the next rate period by 250 percent or more. An increase of this magnitude would have widespread negative economic consequences. Already we are seeing some businesses curtail operations or even close as a result of high energy prices. With such an increase, we would surely see more businesses close and more jobs lost. The effect could be devastating for a regional economy that is already in a slow-down. People with lower incomes would suffer disproportionately. And, a weak economy frequently translates into less public support for environmental protection.

The most immediate and direct way to decrease the size of Bonneville's rate increase is quite simply to decrease the amount of power Bonneville has to buy in the market. And, since we must file our new rates with the Federal Energy Regulatory Commission (FERC) by the end of June 2001 to have them in effect by October 1, 2001, we have very little time to implement a strategy to accomplish this.

I have asked customers to significantly reduce their demand for power in the upcoming rate period. We are negotiating with our direct service industry (DSI) customers to stay off-line for up to two years. Almost all of the region's aluminum smelters are already shut down in the current drought. Bonneville is offering to pay for the continued curtailment so the companies can cover full wages and benefits for their employees who would work if the smelters restarted in October with Bonneville power. This is a lot of money, but it is only a tenth of what it would cost the region's ratepayers to buy power for these smelters. We are also asking both our public and investor-owned utility (IOU) customers to reduce demand by up to 10 percent.

It is absolutely critical that the region be successful in this load reduction effort. Failure would mean the loss of jobs, significant unnecessary rate increases, and a greater risk of power blackouts this winter.

LONG TERM: DEVELOPING RESOURCES AND TRANSMISSION INFRASTRUCTURE

Bonneville is working to do its part to help meet long-term electric power challenges. We are working with developers to buy the output of planned new facilities in the region in order to meet our firm obligations in the next rate period. Bonneville has also signed agreements with two of its DSI customers in recent months that encourage their development of combustion turbines to help serve their aluminum plants.

Bonneville expects to make significant investments in energy-efficiency related activities over the next five years from 2002 to 2006. Our goal is to achieve at least 215 aMW of additional savings from this investment. We have included a discount in our rate proposal for customer utilities that would accomplish conservation through their own investment. This funding commitment includes $15 million for low-income weatherization to be administered through the well-established four-state/Community Action Program infrastructure. We believe this is an important component because citizens on fixed or low incomes are hit the hardest by high-energy prices.

We are working with the U.S. Army Corps of Engineers (Corps) and the Bureau of Reclamation on substantial investments in the efficiency and reliability of the Federal hydro system to yield more MW and more reliable power from the same amount of water.

Renewables are very much on our front burner. Since May 1999, we have purchased 35 MW of wind energy and 49 MW of geothermal. We have 560 MW of wind under development. We have also just received 25 proposals for wind projects totaling 2,600 MW in response to our request for proposals for 1,000 MW of wind power. We are also collaborating on several solar projects.

Building new generation will not solve the region's power shortage unless the power can be transmitted from where it is generated to where it is needed. The region is operating at or near its full transmission capacity. In many places, transmission paths are constrained and the transmission lines cannot carry additional power from generation sites to load centers. The complexity of wholesale power transactions since open access places more demands on the system. At the same time, the market has prompted a flurry of generating resource development. Bonneville has received requests for generation integration studies for about 27,000 MW of new generation in the Pacific Northwest.

Bonneville's transmission system represents 75 percent of all high-voltage transmission in the Pacific Northwest. Most of this system is over 30 years old. For years, we have boosted transmission capacity on the existing system through adding shunt capacitors and new controls. But forecasts are for Northwest winter peak loads to grow by 12 percent by 2008, and thousands of megawatts of new generation are planned. Increased electric loads, the complexities of wholesale power transactions and new generation make it clear that there must be significant investments in the Northwest system to ensure continued reliability and to address the electric supply/demand imbalance in the region.

CONCLUSION

Since the West Coast power crisis began to emerge, Bonneville and the other stakeholders in the Northwest power system have done a heroic job of responding to the challenges. There is an enormous amount of work left to do, though, and the light at the end of the tunnel still seems too far away.

The next one or two years will be difficult, but we believe that with the actions we have outlined, continued effort and regional cooperation can bring us through this period with the lights on, the economy intact, and on track with the long-term fish recovery plan.

Mr. Chairman, members of the Subcommittee, thank you for your attention. I am available to answer any questions you have now about the Northwest drought and Bonneville's rate mitigation strategy.

Mr. CALVERT. Mr. Pedde?

Mr. PEDDE. We're just here.

Mr. CALVERT. You're just here? You don't have any additional testimony?

Okay. I am kind of curious. You mentioned the additional power that's coming on-line. You mentioned 28,000 megawatts as being investigated in this region and you're about 3- to 5,000 megawatts short.

What kind of generation is that?

Mr. WRIGHT. It's almost all natural gas fired and combustion turbine. We have a little bit of wind resource being developed. There was some discussion about coal resources over in the eastern side of the region in Montana and a few other things. But this is basically it.

Mr. CALVERT. Is this—are you having the same difficulties here in the Pacific Northwest as other regions in the country on gas distribution coming into your state?

Mr. WRIGHT. Yes. We are really concerned about that. We've been working with the gas industry on the need for gas pipeline capacity, in particular.

What the gas industry has told us is that they think that they can support, with their current pipeline capacity in this region, up to perhaps 2,000 megawatts of new generation, although that would compete against other uses of gas as well. We probably need more than that.

There is some expansion that the gas industry has now committed to just in the last month. Our suspicion is that we may need more than that.

Mr. CALVERT. Is most of your natural gas brought in from the British Columbia area? Where do you get most of it?

Mr. WRIGHT. Yes, and Alberta.

Mr. CALVERT. Now, one of the key decisions that created the potential for the Bonneville rates to increase as much as 300 percent after 2001—I guess to that degree—to what extent were the decisions made by Bonneville, and to what extent were they made by the former Secretary of Energy?

Mr. WRIGHT. We had at least one issue that was extremely difficult for us, and that was how much service can we provide to the aluminum industry in this region.

We had made a proposal that we would provide them with about 900 megawatts. And, it's important to understand we have a statutory obligation to serve the public utilities and a statutory obligation to serve the investor owned utilities.

There was a statutory obligation to serve the aluminum industry, which expires at the end of 2001—the end of this contract period. And the question was, how much should we provide them? We offered them 900 megawatts. We had a great deal of involvement from several folks including the Secretary, who ultimately decided to offer them a greater amount of power. So, there was some involvement there.

Mr. CALVERT. Well, should Bonneville agree to sell 1,500 megawatts to the direct service industry?

Mr. WRIGHT. We agreed to a discussion in the region about that. At that point in time, we believed that we could do so without causing a rate increase to other customers. And, it was based on the market prices at that time.

In hindsight, I would have to say that one could question that decision, knowing where the market is today, although I don't think anyone at that point knew where the market was going.

Mr. CALVERT. But you were not legally compelled to do so?

Mr. WRIGHT. We were not legally compelled to do so. That's correct.

Mr. CALVERT. Bonneville has also agreed to sell 1,000 megawatts to investor utilities for the region.

Does Bonneville have a legal obligation to sell power to investor owned utilities?

Mr. WRIGHT. The law is very clear that we have to give priority access to our present customers.

There is an obligation to serve any load which the investor owned utilities choose to place on us. And there is also a program called the Residential Exchange Program, which provides some benefits to residential customers and small-farm customers of the investor owned utility. And our view is that there is an obligation to serve there for the residential and small-farm customers.

Mr. CALVERT. Mr. Smith?

Mr. SMITH. As we look at the solutions—let's start with the long-term side—that what we need to do—as part of this hearing and how we got into this mess—you heard, I think, Mr. DeFazio's comments about the 1992 Deregulation Act and the effect it did have on the industry and the price of power.

First, I'd like for you to comment on the '92 Act and whether or not that sort of got us off the beam and got us to the point where

there was not sufficient supply developed and prices were—you know, out of control and if we should revisit that.

Mr. WRIGHT. Well, I think we're in the midst of a transition. Before the '92 Act, it was fairly clear that there was an obligation to serve on the part of the utilities and, therefore, an obligation to develop resources.

It's sort of a combination of the '92 Energy Policy Act and deregulation that has been occurring in individual states. It has begun to separate that obligation to serve to make it less clear to the utilities whether they have that responsibility and, if they don't have that responsibility, whether they're going to be able to recover their costs when acquiring resources.

As we traveled through the late '90's, I would say that there was a tremendous reliance on the market to provide resources. Look, for example, at the Bonneville Power Administration. Up until that time, I think there was a sense that Bonneville had an obligation to develop resources as well. The Comprehensive Review by the region's governors and political—.

Mr. SMITH. I'm sorry to interrupt.

Why do you think the market was so pathetically slow to respond, as it turns out, to get us into this situation we're in right now?

Mr. WRIGHT. My sense is that we have had a supply-and-demand problem that has been masked by the fact that we've had good water in this region for the last 5 years. So prices have been relatively low. When marketers looked at this region, and they saw the prices they didn't see an economic payback. What they didn't see were the underlying fundamentals, which were that there were real concerns with the loads and not having the resources.

Mr. SMITH. I guess what strikes me—and I'm no economic genius, despite my name—but from eight—it seems like in an incredibly short period of time, we went from the best of all possible worlds with incredibly cheap power—in fact, as I said, when I first came to Congress in '97, the supposed problem Bonneville had was the market was so low, we were concerned about not using (inaudible).

What Bonneville was concerned about was how they were going to get people to re-up their contracts. PUD's were publicly talking about not wanting to do contracts with PDA'S; the power was cheaper elsewhere. And then bam. Eighteen months later, it's off the charts in the other direction.

I guess as regulators—and that's what we're supposed to be in Congress and what part of the BPA is supposed to be—what can we do better to make sure we don't have this sort of incredibly quick turnaround? How can we regulate the market to make sure that it's more responsive?

Mr. WRIGHT. Well, one of the key characteristics of the commodity market is volatility. And what we're moving from is a regulated market, which provides stability, to a commodity market, which would be volatile.

The way to deal with volatility is by having hedging instruments and other instruments to try and protect against volatility and price swings.

And if, in fact, we as a country are going to continue on the path toward deregulated markets, we are going to have to ensure that customers have the access to mechanisms that will hedge against that price volatility.

Mr. SMITH. But should we continue down that path, I guess, is the ultimate question, given that situation and given how important electricity is, first of all?

Second of all, how difficult is it to build a power plant? I mean, it's not like building widgets, if you will. Okay. We need to know who will crank them out. I mean, it takes a long time, not just for the power plants, but to build the transmission grids as well.

I guess what I'm asking is, based on your expertise in the area, is the electricity market one that is going to benefit from the typical free-market competition given those limitations that we talked about? That's ultimately—should we continue down that path, or should we go back?

Mr. WRIGHT. There clearly are some benefits that can be derived from a competitive, full, subpower supply market. We saw it in 1995 and '96. When there was excess supply, prices dropped below Bonneville's rate. It was an incredible period. In fact, people were sharpening their pencils, and there was some benefit from that.

We have now seen the opposite side of that equation, which is when there's not enough supply, then prices go so high, that more than offsets the benefits that were derived from the '95-'96 period.

The challenge here, I believe, and has always been, we have to make sure that supplies are at least close to, and in some cases, oversupplying the market. And we have to assure that as we develop these markets, that we can at least get the 15 percent reserve market that we became accustomed to in the overregulated market, because after that, you have less of a reliability and you have much higher costs.

But can we craft policies that lead to a 15 percent or better reserve market? That's how you get to higher reliability and lower prices for consumers.

Mr. SMITH. We're almost out of time. I want to ask you one question on the short-term side of the equation.

You are right, from a statutory standpoint, an obligation to serve the DSIS expires this year. But does have a rather—an impact, particularly on the aluminum industry—there are a couple of exceptions—in terms of their ability to stay in business. And there are a lot of concerns that—you know, just paying them for 2 years to sort of keep that it may not work for all the companies. I know we just signed an agreement with ALCOA, I believe it is.

I guess the question is, in the short term, what you're trying to do is reduce the amount of—of power that's consumed so that you're not as vulnerable in the wholesale market. That's absolutely what you have to do. But the consequences of that can be pretty severe, you will see. You're negotiating new contracts, and maybe we can come out of it okay.

But short of simply trying to cut off the amount of power that is used, in the short term, isn't the only option that we really have, to try to go to some cost-based pricing scheme to get that wholesale market that you have been more exposed to than you would like,

given the lack of rain, under control? How else can you do it, and would there be that big of a negative circumstance?

I mean, you can look at the market right now for wholesale power. It is not a fair market today. It's not like price caps are going to come in here and mess up a perfect market. I mean, it has been out of whack for quite a while. There is not the sort of free choice and free competition that the open market contemplated.

Isn't that something that we have to consider rather than having you go around trying to cut off as many people as possible to keep from being exposed to that market?

Mr. WRIGHT. Well, our view is that first of all, the fundamental problem here is supply and demand. And, by taking these actions, what we're doing is reducing demand. I think your key questions are what does it mean for industry and the region, and are we headed toward shutting down the aluminum industry long term? We are trying to be very careful and cautious about the way we do that so that it does not get us to that position.

Our view is that—the way we are structuring our rates, they will track the market, and as the market prices come down, we will be able to take advantage of that. Therefore, we think we would be able to within a couple of years—offer rates that would allow the aluminum companies to operate profitably within this region.

In the interim, by paying the workers, we think it allows them to retain a semblance of a work force so that they will be able to come back up. There'll be a work force, a hugely trained work force, that remains available to them.

In trying to think that through, the actions we need to take to assure that this is not—as someone once said, "This is not the execution of the aluminum industry; this is a hibernation period"—that it leads to lower costs for all consumers and more jobs in the Northwest.

Mr. CALVERT. Before I ask Mr. DeFazio—let me ask a quick question.

The fact—what we were discussing earlier—obviously, this summer, we have a problem. We have a ser-—we have problem. Obviously, in my hometown, when the lights went off yesterday, we had a problem throughout—throughout—(inaudible)—and—talk about the market. And I'm going back to the 28,000 megawatts you mentioned that the people talk about building right now.

And I know talk is one thing and actual execution is another. But if a third of those megawatts came on-line over the next couple of years—and you can't predict rain—nobody in this room can—but if you get back to normal rainfall in a relatively short period of time, a year to 2 years, you could have a situation where you have much more than the excess of the 15 percent reserve capacity you're talking about; isn't that correct?

Mr. WRIGHT. I think that is possible. I think there is a good shot of that happening. Part of the question here, Mr. Chairman, to be honest, is, what's going to happen in California? This has been the great unknown for us. We could get those kinds of reserve margins for the Northwest, but it could all end up going to California.

And I think one of the great frustrations—to be candid about it—is the amount of resources that's off-line in California. This is a

confounding factor in trying to figure out what we need to do in the Northwest.

Mr. CALVERT. And I understand that like—I don't know if I do understand the problem.

Mr. DeFazio?

Mr. DEFAZIO. Thank you, Mr. Chairman.

The way the conversation has been going, I think I have to go to transmission first because of the point that Mr. Wright has raised about the possibility of the ability to build resources in this part of the country serving California. I guess it raises two questions.

One is, we might build more than the reserve, but in a market where you have severed the duty to serve—and the duty is only to the stockholder or, to maximize profit—it doesn't mean that that 20 percent margin is—if it was built—is even available on a day when we need it, or it might be wanting to sell outside the region when we need it; isn't that correct?

Mr. WRIGHT. That's correct.

Mr. DEFAZIO. So basically, we're headed toward unpredictable reliability and/or price volatility no matter what. The volatility may be on the down side. There may be a whole bunch of people out there building a plant today thinking they're going to get rich. Looking at the market, they're going to find out suddenly it's tanked; right? I mean, it can go either way?

Mr. WRIGHT. Again, I think price volatility is integral to the commodity market, and there are ways to protect against price volatility.

Mr. DEFAZIO. Well, there's catches, I'm sure, and all those wonderful things. But then beyond that, the issue also becomes reliability. No matter how much margin we have or excess capacity we build, if they don't have to run those plants—which, in a deregulated market, they don't—it's my plant. I don't want to run it. Isn't that correct?

I mean, that—we could have 100 percent access, and we could still have the lights go out because on that day, only 9 percent of the supply was available because the other 110 percent just didn't want to generate. They didn't think the price was high. Isn't that correct?

Mr. WRIGHT. Merchant plant operators have the ability to control the operation of their plants.

Mr. DEFAZIO. Right. So this is the future. This is great.

Then on the issue of your purchases, you said, "$4 billion to purchase." what are you assuming per megawatt hour? I mean, if you come up with $4 billion.

Mr. WRIGHT. It's in the range of 225.

Mr. DEFAZIO. 225?

Mr. WRIGHT. 225.

Mr. DEFAZIO. And what was—two years ago, what was the—the price for those sorts of purchases?

Mr. WRIGHT. It would probably be in the range of about 28.

Mr. DEFAZIO. Okay. So basically, eight times the price in the wholesale market today to replace the power?

Mr. WRIGHT. Yes.

Mr. DEFAZIO. So we could safely say if we were in a drought, in the markets of 2 years ago, we could afford enough energy to meet all of the BPA's contractual commitments, including the aluminum companies, with a modest rate increase?

Mr. WRIGHT. Yes. Actually in May of last year we thought we could do it with no rate increase.

Mr. DEFAZIO. No rate increase? But that was assuming that you can buy replacement power cheaper than even 2 years ago?

Mr. WRIGHT. Actually, yes. We thought we could serve all of the loads that we had at that time. Part of the problem here is that the price has gone up incredibly. We have a lower amount of load so that there is an interaction between the amount of load placed on us and price.

Mr. DEFAZIO. And in fact, in the next 5 years, you might see a bunch more people coming to BPA?

Mr. WRIGHT. If prices stay as high as they are, I'd expect it.

Mr. DEFAZIO. I had a conversation with a gentleman last night who told me that the Port of Seattle has formed some sort of public utility district and will be placing load on the BPA in 5 years?

Mr. WRIGHT. It is my understanding it will.

Mr. DEFAZIO. And so it will end up paying the state of Oregon for a municipal—overtook PGE, which is for sale—then you would have some other additional load.

Mr. WRIGHT. Some Members of Congress, I've heard, have suggested—yes. Actually, I think that—that is—I mean, if they are a public utility, they have preference. And so by statute, we are required to serve them.

Mr. DEFAZIO. So given that and given the volatility of the markets and the safe haven the BPA represents, are either the publics themselves or BPA looking at that 5-year to 10-year rate period in terms of basically building any generation or increasing capacity somehow, or are you just going to depend upon and hope that the market gets better?

Mr. WRIGHT. Is Bonneville planning to?

Mr. DEFAZIO. Well, right. Is Bonneville and/or your public customers. And are there statutory restrictions? Are there things that you review to determine whether or not, BPA and/or the publics could construct generation that would be more reliable and that would run when we wanted it to run and that we could shut it down when we wanted to shut it down and that we weren't dependent upon the vicissitudes of the market?

Mr. WRIGHT. Well, the authorities are there for Bonneville to acquire resources if it's the will of the region to do so. And as you know, Mr. DeFazio, we've had a lot of debate about whether Bonneville ought to be doing those kinds of things.

In fact, I think we agreed in '95 and '96 that Bonneville should not be acquiring resources. There are some good experiences and some bad experiences with respect to that. So that would be a question, I think, for the region, is this the right thing to take on?

With respect to our public utilities, they have concerns with respect to the Section 5(b) 9(c) policy.

5(b) 9(c) is a policy that Bonneville has articulated. There are provisions of law that say Bonneville should not allow people to sell

their resources outside the region and then place the load on Bonneville.

It does—in some cases, discourage the re-sale by public utilities. The way the policy is implemented, we are spending a tremendous amount of time with our public utilities right now trying to figure out how we can meet both of our goals.

We want to encourage resource development in the region, but we also want to make sure that we are not encouraging existing resources to flee the region and therefore place a greater cost on the region.

Mr. DEFAZIO. But what if, say, those public entities would enter into an agreement with you to sell outside the region but devote all of the profits to constructing a plant which would be dedicated to serving in-region loads exclusively and at the time after which they have constructed the plant they would perhaps reach outside the region?

I mean, this is—I note that my own (inaudible) board is making millions of dollars in the speculative energy market at the expense of our California friends, unfortunately, but they're helping keep the lights on.

This is an awfully lucrative market to tell public utilities to ignore, and I'm wondering if you enter into agreements with the aluminum industry to curtail load but pay them and have them devote some of that resource toward building future generation, why wouldn't we do something similar with public utilities if we do it with some of the aluminum plants?

Mr. WRIGHT. Well, in fact, it's sort of how the 5(b) 9(c) discussion is going right now, because 5(b) 9(c) would encourage utilities if they develop a resource to offer the power within the region first before selling it outside the region.

The difficulty for a public customer, candidly, is that they feel like they're exposed to the market and when they make purchases, they're making them at market prices and if they're required to sell them at cost, then they feel like they're playing on an unlevel playing field.

So, the problem that you're identifying, one that we are struggling with right now is, how do you create something that serves to lower costs for Northwest consumers but doesn't put an individual utility willing to take risks to develop resources at a competitive disadvantage?

Mr. DEFAZIO. Uh-huh. I mean, what I see potentially happening here—I just am very pessimistic and—most industries, most people will not tolerate an unreliable electricity supply. We don't live in India. So, I think that's going to become a higher and higher fact.

I saw someone here in Tacoma, or someone had offered a server farm in this area 100 percent or 99.99999 percent reliability for a mere four times their normal going rate.

I don't think homeowners are going to be willing to pay four times as much for their bill with a guarantee that their lights won't go off—or businesses.

So I'm just thinking there is going to be a big rush among those who are eligible, and perhaps among some who will become newly eligible, to BPA in the contract period 5 years out.

I'm just saying we should be looking and trying to assess that 5 years out and determining whether or not you're going to be in the resource construction business, because you can be in the one place where people know if you've got it, you will run it, and the lights will stay on, and they can afford it; and everywhere else, it will be, "Well, maybe the market will be good today, and I can afford to keep my lights on; maybe it won't be good; or maybe they won't sell into the market because it's so low and my lights will go out." That's where we're headed here.

Thank you.

Mr. CALVERT. Mr. Larsen?

Mr. LARSEN. Steve, thank you for coming this morning.

You mentioned that in the next couple of years—I don't want to put a time line on it—but you're expecting a softening of the prices, which—I hear you saying a lowering of the rates out there.

Have you come to the conclusion about what that rate might soften to?

Mr. WRIGHT. Well, Mr. Larsen, I have to say that our ability to forecast these markets, our track record on that is not that great. I have to say that anything I say here, you have to take with a large grain of salt.

But having said that, our hope is that we can get to a rate that will be attractive to the industry and the Northwest, and that we can get there within a couple of years.

What we are shooting for is a 100 percent rate increase for this fall. We see this fall as being the worst period.

Mr. LARSEN. It's related to my next question, because we are able to negotiate a—Woods, Woods, and Talco, the ALCOA copper plant in Ferndale—I think one element of that package was every 6 months, you'll be reviewing with ALCOA what the rate is out there and whether or not that rate is going to be economically feasible for ALCOA to get the plant actually running again.

In other words, half the job is done. There are wages and benefits for the workers. The other half is now getting people back to work.

And the question I have is, are you—are you specifically looking at what it would take to address getting the—the aluminum plant or—and the other plants up and running, or is that just part of the mix that you're looking at? You sort of addressed it, I think, in response to—to Adam Smith's question, but I just want to get a more specific answer.

Are you specifically looking at that, or again, it's just part of the—the general environment you're looking at?

Mr. WRIGHT. Well, it turns out that it's not an "or." it's an "and." Our goal is to get the rates as low as we can. It's our sense that, from our forecast of the market, that the rates can come down to a point at which the company would be profitable to operate within a couple of years.

So, the way I look at it is we should do everything that we can to try to get the rates as low as we can. And we think that that can lead to at the aluminum plants in this region operating profitably.

Mr. LARSEN. A question that's somewhat related but I hear a lot of, in talking with folks, has to do with the—the must-sell orders

that were issued late last year by the Secretary of Energy and then continued again this administration and then ended up in February.

The concern we—that I hear is, "Are we going to be sending our power"—quote, "our power"—"to California this summer?" and usually that's the way it worked.

Mr. WRIGHT. Uh-huh.

Mr. LARSEN. —excess power to California in the summer, excess power to Washington in the winter. It's gone off that track last winter.

Under what circumstances in these criteria would the Secretary of Energy make a decision to issue must-sell orders this summer and send power generated to the Northwest south to California, or anywhere else, for that matter?

Mr. WRIGHT. Well, it's my understanding that the Secretary had submitted an order. And our view is that we enter into a mutually beneficial transaction with California, when it makes sense from our system's perspective, and also when it makes sense from their perspective.

We have had extensive discussions with the Californians about what types of transactions we would enter into this summer and tried to describe to them, in fact, that we don't have a lot of supply.

But there are things that we can do for them. The exchange agreements that we entered into last year, were highly beneficial for the Northwest. In fact, they were so beneficial that California is going to renegotiate them.

Mr. LARSEN. The two for one?

Mr. WRIGHT. Yes. The two for one, actually, was based on historical differences in price between off peak and on peak. That price differential dissolved this winter. So the two for one turned out to be hugely beneficial for the Northwest. The Californians had wanted to renegotiate. So we've agreed to how we will set up an exchange agreement for the summer.

We also began to talk about what would happen if the lights go out in California, and we're still in a situation in the Northwest. The biological opinion would call for us to interrupt the spill in order to preserve reliability. And that's not limited to the Northwest region.

So, we've begun to have discussions if that were to occur, concerning what sort of compensation would the Californians provide. And what we have argued, and Californians have been accepting of, is that there should be some environmental premium that California would pay us a premium in terms of the return.

Mr. LARSEN. This is just a comment. And it's heartening to hear that the secretary of (inaudible)—I'm still hearing you say there will be some exchange this summer, and I would encourage you to keep the delegation in the Northwest—and California delegations—fully apprised of how it's playing out, because we are very likely to hear from—from constituents about any exchange that takes place between the Northwest and any other region of the country.

Mr. WRIGHT. I appreciate that. If I could, just comment on the exchange. I want to make sure that everyone does know that in the exchanges we have entered into with California—California has fully repaid the amounts we have sent down with the two for one.

Mr. DEFAZIO. Just on that exchange, if you're going to exact an environmental premium on those, if you were in a spill situation and liability became a problem, you stopped spilling and generated and transmitted to California, would that money go into some sort of segregated account?

Mr. WRIGHT. Well, actually, it's not money. It's kilowatt hours, and—.

Mr. DEFAZIO. So it's kilowatt hours. Could you expand on that just for a second?

Mr. WRIGHT. Right. It's an exchange. What we would get is a premium return, a kilowatt hours return. Our intent is to try to dedicate that premium back to fish.

Mr. DEFAZIO. You would then use less water at some off-peak time to generate, therefore conserving some water in the system, therefore having more water to provide for flows or spill or something later for the fish; is that right?

Mr. WRIGHT. Right. And how we're going to do the accounting on that, we haven't figured out. Things are moving fast.

Mr. DEFAZIO. Thank you.

Mr. CALVERT. Mr. Pedde, I guess, based upon this conversation—obviously, we're trying to maximize power this summer as much as possible for this region. How is that—how is that affecting the contract orders?

Mr. PEDDE. In terms of contract water orders, not directly. Our contract regulations switch priorities to meet those contracts. We sell surplus power to Bonneville, provide surplus power on to Bonneville. We don't sell to them. So in terms of meeting our contract needs, we're not affected at all at this time.

Mr. CALVERT. Mr. Smith?

Mr. SMITH. I have to ask this fairly basic question. I know some—certainly constituents in California (inaudible) up here would ask as well—it seems that we have sufficient supply capacity to serve the needs on the western grid. If it were to all be operated, even with the drought situation—I guess that's the first question, is whether or not we do.

You mentioned that there was a steady number of supplies offline in California and serving those areas and—you know, I understand within terms of setting the price, how high the price is.

But if you have a situation where people are, as we are in California right now, in a blackout situation, a situation potentially that could come to the Northwest this winter, is there anything that we could do as public policymakers to make sure that that available supply is used to prevent this, and if so—I mean, why isn't that happening in California? Why do you have generators not operating and the lights are going out? That seems to be a pretty substantial failure of public policy.

Mr. WRIGHT. Mr. Smith, that is the right question, and I wish I had a good answer for you. Two things, I'd say.

First of all, there is a supply shortfall. If you look at the peak loads that are likely to occur on the West Coast this summer relative to the amount of supply, and if everything is running, we do have a shortfall. So there are periods in which, even with everything running, we come up short.

But the shortfalls that we're seeing this month, when we're not at peak loads, are a little difficult to understand. We have sought to try to understand that there are plants down, some of them for plant maintenance. That certainly makes sense. The Columbine Generating Station is going down today for plant maintenance.

But there are other plants down with forced maintenance, and it seems like a lot of that is out. And some people say it's because they ran the resources so hard last summer and fall, that now we're paying the piper. I'm trying to figure out how we get past that problem. I think it is a critical part of trying to resolve this problem.

Mr. SMITH. Overall—I mean, just—the big difference—since demand has gone up, supply has gone down, how much, truly, in the western grid has demand gone up over the course of the last two or 3 years? I'm trying to figure out, you know, where—did demand go up 10 percent and supply dropped off? What happened? Has supply not gone up at all? Has it dropped off? My understanding is demand has gone up, but—2, 3, 4 percent, but not—not obnoxiously high. Can you just give us your input.

Mr. WRIGHT. I don't have those numbers, as they're different, on the tip of my tongue. But I'd like to provide those for the record, if I could, certainly on the demand side.

On the supply side, I know there has been an increase—and it has been a substantial amount—in the Northwest, in particular. But I think a bigger problem is that we, on a net basis, have lost resources in this region, when we shut down the nuclear plants. And we operate the system more now for fish, and for good reason. We've added only a couple of small combustion turbines in the last 10 years.

Mr. SMITH. Thank you, Mr. Chairman.

Mr. CALVERT. Thank you.

I will say that the demand in California went up significantly in the last 3 years, the average in the double digits, as we didn't have additional power generation coming on-line. And one of the problems in California is some of the contracts with some of the—some of the plants were less than the cost of production. So that's where the problem is in the market right now, is attempting to get—renegotiate those contracts to get those plants back on-line.

Mr. DEFAZIO. Mr. Chairman, may I have just a moment?

Mr. CALVERT. Certainly.

Mr. DEFAZIO. I've quite closely followed the statistics of the California ISO's, and your peak demand this year is less than 2 years ago; and your consumption over the time period was up about 4 percent until this year, where it's dropping rather precipitously; and your peak demand is below. I'd just like to set the record straight on that. Your demand is not up in the double digits.

Mr. CALVERT. Well, according to the statistics we have, our demand has increased significantly—a number of years, overall—.

Mr. SMITH. (Inaudible) State of California—.

Mr. CALVERT. We'll move on to—if there are no additional questions for this panel, we'll move on to the next panel.

The second panel is Mr. Steven Klein, Superintendent of Tacoma Public Utility; Mr. Brett Wilcox, President and CEO of Golden Northwest Aluminum; Mr. Randy Settler, Secretary of Columbia

River Inter-Tribal Fish Commission; and Mr. Tom Karier, Power Committee Chairman, Northwest Power Planning Council.

Gentlemen, thank you for attending today. We do have a—a time light right there. When it gets to yellow, you have 1 minute remaining. You have 5 minutes for your testimony. Please try to stay within that 5 minutes, and we'll have time to ask any questions.

With that, Mr. Klein, you may begin.

STATEMENT OF STEVEN J. KLEIN, SUPERINTENDENT, TACOMA POWER

Mr. KLEIN. Thank you.

Mr. Chairman and members of the Committee, the current crisis—as we've talked about already this morning, the situation in the Northwest is a result of a drought of epic proportions coupled with the failed industry restriction effort in California that destroyed the opportunity to rely upon the traditional diversity between the winter peak in the Northwest and the summer peak in Southwest and led to a market failure that drove the price of wholesale energy into the stratosphere.

Tacoma Power is a municipally-owned electric utility in Washington state, serving approximately 155,000 customers within a service territory of 180 square miles.

Tacoma Power has a long legacy of conservation and power generation development over its 106-year history. We also have depended upon other contractual resources with various Northwest entities, including the Bonneville Power Administration.

At the end of the year 2000, we had cash reserves of $120 million and had not had a retail rate increase for 6 years. Prior to that, from 1989 to 1995, the few rate increases that we did have were at or below the rate of inflation. We are neither a proponent nor opponent of electricity industry deregulation. We did not fear competition and choice, because as a consumer-owned utility, we represent the ultimate demonstration of choice. We also follow a strategy that puts our customers first. And we have a legacy of innovation and exceptional cost management. This continues to deliver high value to a loyal customer base.

But our world began to change last fall. As late as November of 2000, the National Weather Service organizations were still forecasting wet or wetter than normal weather patterns for our area.

By December, the Northwest did not yet see normal precipitation. A cold weather front was forecast and announced publicly to hit the Northwest beginning Sunday, December 10, 2000, with the coldest expected to fall upon the following Tuesday.

That Friday before, on December 8, we witnessed an unprecedented surge in the price of wholesale power. Tacoma Power purchased power that day at nearly $3,000 a megawatt hour.

Anticipating the impending cold front and associated high electricity demand, we attempted to buy forward for Sunday through Wednesday but could not find a willing seller at any price.

Facing the inability to meet the forecasted low, we called upon our large industrial customers to shut down Sunday and remain down until further notice.

The cold snap turned out to be milder than predicted. We did find power available on Monday; however, from that weekend until

today, the power market remains highly volatile, and prices are typically eight to ten times what they were 1 year ago and certainly beyond that in—in spot circumstances.

Tacoma Power has spent over $140 million beyond our normal level of expenditures to purchase market power. We have depleted our once robust cash reserves and must now depend on a bank letter of credit to preserve our financial position. This is on top of the fact that Tacoma Power was the first utility to respond to this first stage of this crisis by raising our retail rates an average of 50 percent, effective clear back in December of last year.

This system average rate increase sent a strong price signal as the rate increases range from 43 percent for residential class to up to 75 percent for commercial/industrial.

Tacoma Power and the community we serve set an aggressive goal of 20 percent conservation since January of the beginning of this year. The cumulative conservation attained across our customer base is 13 percent and growing, with April alone at 17 percent.

Tacoma Power has also pursued other strategies to mitigate the crisis, including temporary diesel generation. We continue to advise our state and Federal representatives and appreciate the opportunity to testify here today.

Tacoma Power's customers have felt the sting of the real market price since December of last year, where some customers in California are only reading about what someday may be coming for them.

As if a 50 percent system average rate increase were not enough, the additional hit from a BPA rate increase projected to be as much as 100 to 250 percent this coming October—why does the Washington, D.C., establishment continue to view the energy crisis as only impacting California? Our citizens can understand the variability of weather but have a hard time grasping the other aspects of this crisis.

The California restructuring originally guaranteed rate decreases and certainty to California consumers. The California electric utilities were able to sell off generation assets for multiples of book value. Independent power producers were allowed to enter the wholesale market with no regulation or rules. Northwest rate payers also questioned the actions of an administration that forced the BPA to commit power it didn't have to provide even greater benefits to the Northwest direct service industries.

The Energy Policy Act of 1992, supposedly well intentioned—and represented a response to an expanded global economy and the demand for competition and choice that previously led other industries to deregulation.

However, unique complexities and essential needs that electricity serves has been greatly misunderstood and underestimated by market idealists and reformists.

The California experiment sought to establish a "textbook market" and failed miserably. As a result, the citizens of California and the Northwest will be paying higher rates for years rather than enjoying the supposed benefits of deregulation. In many ways, the system in the Northwest, whose economy has been built upon rea-

sonably priced power, will suffer the most and face a future of uncertainty.

Thank you.

Mr. CALVERT. Thank you, Mr. Klein.

[The prepared statement of Mr. Klein follows:]

Statement of Steven J. Klein, Superintendent, Tacoma Power

The current crisis situation in the Northwest is the result of a drought of epic proportions coupled with a failed industry restructuring effort in California that destroyed the opportunity to rely upon the tradition diversity between the winter peaking Northwest and the summer peaking Southwest and also led to a market failure that drove the price of wholesale energy into the stratosphere.

Tacoma Power is a municipally owned electric utility in Washington State serving approximately 155,000 customers within a service territory of 180 square miles. Tacoma Power has a long legacy of power generation development over its 106-year history and we also have depended upon other contractual sources with various Northwest entities including the Bonneville Power Administration (BPA).

At the end of the year 2000 we had cash reserves of $120 million and had not had a retail rate increase for six years. From 1989 to 1995, the few rate increases we did have were at or below the rate of inflation. We were neither a proponent nor opponent of electric industry deregulation. We did not fear competition and choice because as a consumer-owned utility we represent the ultimate demonstration of choice. We also follow a strategy that puts our customers first and we have a legacy of innovation and exceptional cost-management that has continued to deliver high value to a loyal customer base.

Our world began to change last fall. As late as November 2000, the national weather service organizations were still forecasting "wet or wetter than normal weather patterns" for our area. By December the Northwest had not yet seen normal precipitation. A cold weather front was forecast and announced publicly to hit the Northwest beginning Sunday, December 10, 2000, with the coldest point expected to fall on the following Tuesday. On Friday, December 8, 2000, we witnessed an unprecedented surge in the price of wholesale power. Tacoma Power purchased power that day at nearly $3,000 per mWH. Anticipating the impending cold front and associated high electric demand we attempted to buy forward for Sunday through Wednesday and could not find a willing seller at any price. Facing the inability to meet forecasted load we called upon our large industrial customers to shut down Sunday and remain down until further notice. The cold snap turned out to be milder than predicted and we found power available on Monday, however, from that weekend till today the market remains highly volatile and prices are typically 8 to 10 times what they were just one year ago.

Tacoma Power has spent over $140 million beyond our normal level of expenditures to purchase market power and we have depleted our once robust cash reserves and must now depend upon a bank letter of credit to preserve our financial position. This is on top of the fact that Tacoma Power was one of the first utilities to respond to the first stages of the crisis by raising our retail rates an average of 50 percent effective December 20, 2000. This system average rate increase sent a strong price signal as the rate increases ranged from 43 percent for the residential class to 75 percent for commercial/industrial. Tacoma Power and the community we serve set an aggressive goal of 20 percent conservation and since January 2001, the cumulative conservation attained across our customer base is 13 percent and growing. Tacoma Power also has pursued other strategies to mitigate the crisis including temporary diesel generation and we have advised our State and Federal representatives and provided testimony at various hearing on the crisis.

Tacoma Power's customers have felt the sting of the real market price signal since December of last year, where some customers in California are only reading about what may someday be coming for them. As if a 50 percent system average rate increase were not enough we, the addition hit from a BPA rate increase projected to be as much as 100 to 250 percent this coming October. Why does the Washington D.C. establishment continue to view the energy crisis as only impacting California?

Our citizens can understand the variability of weather but have a hard time grasping the other aspects of this crisis. The California restructuring originally guaranteed rate decreases and certainty to California consumers, the California electric utilities were able to sell off generation assets for multiples of book value, the independent power producers were allowed to enter the wholesale market with no regulation or rules. Northwest ratepayers also question the actions of the admin-

istration that forced BPA to commit power it didn't have to provide even greater benefits to the northwest direct service industries.

The Energy Policy Act of 1992 was well intentioned and represented a response to an expanded global economy and the demand for competition and choice that had previously led other industries through deregulation. However, the unique complexities and the essential needs that electricity serves have been greatly misunderstood and underestimated by market idealists and reformers. The California experiment sought to establish a "text book" market and failed miserably. As a result, the citizens of California and the Northwest will be paying higher rates for years to come rather than enjoying the supposed benefits of deregulation. In many ways the citizens of the northwest, whose economy has been built upon reasonably priced power will suffer the most and face a future of uncertainty.

Mr. CALVERT. Mr. Wilcox?

STATEMENT OF BRETT WILCOX, PRESIDENT AND CEO, GOLDEN NORTHWEST ALUMINUM, INC.

Mr. WILCOX. Thank you, Mr. Chairman.

My name is Brett Wilcox. I'm President of Golden Northwest Aluminum Company. Golden Northwest owns and operates aluminum smelters at Goldendale, Washington, and the Dalles, Oregon. Normally, we employ 1,225 people and are one of the largest employers in Eastern Washington and Eastern Oregon. We are committed to saving these family wage jobs and continuing to anchor the economy of our distressed rural communities.

Our production and employment currently are curtailed. The Bonneville Power Administration is remarketing the power we had under our contract. Each DSI's contract rights and marketing agreements are different.

Under our company's particular agreement, our employees receive full wages and benefits. Bonneville received over 100—we've received $100 million in cash to invest with other customers. In a pact with Bonneville United Steel Workers Union, we've committed our remaining marketing proceeds to help save our smelter operations by developing new Northwest power projects, including a very significant amount of wind power generation.

Mr. Chairman, your invitation asks that I testify about tiered rates. This is a rate form I proposed to Bonneville to reduce demand during the current power supply crisis. Tiered rates reflect the reality of the market. The buying of the next increment of additional power costs a lot, and reducing consumption of the margin saves a lot. If power consumers receive this "price signal" in their rates, then less power will be used; less will be needed; less will be purchased at higher prices.

Consumers do not have to reduce their consumption—consumers do not have to reduce their consumption by the full amount of the higher-priced tier to receive the benefits of tiered rates.

Experience in Great Britain indicates when the power reserves are critical, the reduction and consumption by only at one and a half percent can reduce market prices by up to 25 percent.

Tiered rates are one of the best ways to lower high power prices. All consumers benefit, whether or not they can reduce their own demand.

I still believe that, objectively speaking, tiered rates are the single-most appropriate "demand-side" policy to encourage conservation and efficiency and help reduce power prices.

Realistically, however, I recognize that politics and confusion and fears have made it virtually impossible, as a practical matter, for Bonneville to adopt tiered rates for its DSI customers.

I won't waste the Subcommittee's time by beating a dead horse. Please note, however, that leaving aside the DSI's, tiered rates still make sense for Bonneville's other customers.

If the utilities pay tiered rates, their customers will soon pay some variant at the retail level. Conservation and efficiency will improve, and consumption and power prices will be lower.

Without DSI's as an issue, I hope Bonneville, its utility customers, the region, and Congress will recognize that appropriate price signals for changes in demand are critical to managing the demand side of the supply-demand equation.

Rather than reduce the demand with price signals, Bonneville's trying to reduce demand among its aluminum—and some nonaluminum—companies by asking them to extend their curtailments for up to 2 years beyond the curtailments now scheduled to end in September.

While our loads have not grown and have not contributed to the current energy shortage, our company would like to be part of the solution to the power crisis.

We are willing to agree to some extent of curtailment but only under terms that are fair to our workers and our company that give us a reasonable assurance we will be able to resume operations when the current crisis ends.

Different aluminum companies are so differently situated that fairness cannot result if Bonneville pursues a "one size fits all" approach to extended curtailments. For example, our company shared its power marketing proceeds with its employees and Bonneville and is using the remaining funds for new power plants to save its smelters and their jobs. No other aluminum company agreed to do that.

Second, each company's cost of "hibernating" for an extended period is different. In addition to continued employee costs, we have other continuing fixed costs from not operating. These costs vary widely from company to company.

We have, and will share, our cost information with Bonneville and allow Bonneville to verify our actual "hibernation" costs. We do object, however, to Bonneville paying us less than anything but the full amount of our company's actual costs. We are willing to help in this crisis, but we can't do so in a way that doesn't cover our costs and therefore threatens our survival.

My company's smelters were built with Federal encouragement at the sites of two dams, neither of which would have been built without these smelter loads to use the power. In a few years, the ever-growing loads of Northwest utilities will push us off the Federal system entirely.

The bell does not toll only for aluminum smelters. Over half of all electric power in the Northwest is used by industry and agriculture. Low power prices have traditionally been the significant competitive advantage of the Northwest industry.

Without abundant and reasonably priced electric power, the lights of factories and of farms will go out all over the Northwest. We face a crisis of paying taxes, not just utility bills. There is a

very real threat that the current power crisis will deindustrialize the Pacific Northwest.

If Bonneville, the traditional economic provider of the region, is now going to confine its power supply to relatively few customers, then Federal power will no longer keep the region's economy healthy.

The ample, reasonably priced power will have to come from new, nonFederal projects. Bonneville has the tools to support those non-Federal projects. We encourage them to use them.

Thank you very much.

Mr. CALVERT. Thank you.

[The prepared statement of Mr. Wilcox follows:]

Statement of Brett Wilcox on Behalf of Golden Northwest Aluminum, Inc. and Northwest Energy Development, LLC

A. Introduction

My name is Brett Wilcox. I am President and CEO of Golden Northwest Aluminum, Inc. ("Golden Northwest"). Golden Northwest owns and operates primary aluminum smelters at Goldendale, Washington, and The Dalles, Oregon. Normally, we employ 1,225 people. We are the largest employer in Klickitat and Wasco Counties, and among the largest employers in Eastern Washington and Eastern Oregon. We are committed to saving these family wage jobs and continuing to anchor the economy of our distressed rural communities.

Our production and employment are currently curtailed for lack of affordable power. The Bonneville Power Administration is remarketing the power we had under contract. Each direct service industry's ("DSI") contract rights and remarketing agreement is different. Under my company's particular agreements, our employees receive full wages and benefits, Bonneville receives one hundred million dollars in cash that benefit its other customers, and—in pact with Bonneville and the United Steelworkers of America—we've committed our remaining remarketing proceeds to help save our smelter operations by developing new Northwest power projects, including a very significant amount of wind power.

As a result, I am testifying today not only for Golden Northwest and our employees, but also for our new power project development company, Northwest Energy Development, LLC ("Northwest Energy"), which is developing three proposed power projects, including our wind projects. Our motto is "Northwest power for Northwest jobs." It's a motto we hope will become that of Bonneville and the entire Pacific Northwest, working and cooperating together as a region.

B. Tiered Rates

The Chairman asked that I testify about "tiered rates." This is a rate form I proposed to Bonneville to reduce demand during the current power supply crisis. Tiered rates reflect the reality of the market: that buying the next increment of additional power costs a lot; and reducing consumption at the margin saves a lot. If power consumers receive this "price signal" in their rates, then less power will be used, less will be needed, less will be purchased at high prices, and average power costs will be lower.

Consumers do not have to reduce their consumption by the full amount of the higher priced tier of power to benefit from tiered rates. Experience in Great Britain indicates that, when power reserves are critical, a reduction in consumption by 1½% can reduce market prices by up to 25%. A recent study for the Electric Power Research Institute suggests that the top 10% of demand is responsible for 50% of price peaks. Tiered rates are the best way to lower high power prices. All consumers benefit, whether or not they can reduce their own demand.

I still believe that, objectively speaking, tiered rates are the single most appropriate "demand-side" policy to encourage conservation and efficiency, and help reduce power prices and rates during the current crisis. Realistically, however, I recognize that politics, confusion and fears (perhaps the politics of confusion and fears) have now made it virtually impossible, as a practical matter, for Bonneville to adopt tiered rates for its DSI customers. I won't waste the Subcommittee's time beating a dead horse. Something different must be done regarding the DSIs and Golden Northwest.

Please note, however, that leaving aside the DSIs, tiered rates still make sense for Bonneville's utility customers. If utilities pay tiered rates, their customers will

soon pay some variant at the retail level. Conservation and efficiency will improve, and consumption and power prices will be lower as a result. Without DSIs as an issue, I hope Bonneville, its utility customers, the region, and Congress will recognize that appropriate price signals for changes in demand are critical to managing the demand side of the supply-demand equation.

C. Extended Curtailments of Aluminum Smelters

Rather than reduce demand with price signals, Bonneville is trying to "pick off" specific aluminum and non-aluminum loads and keep them shut down for a two-year extension beyond the curtailments now scheduled to end in September.

While our loads have not grown and have not contributed to the current energy shortage, our company would like to be part of the solution to the power crisis. We are willing to agree to some extended curtailment, but only under terms and conditions that are fair to our workers and our company, and that give us a reasonable assurance of being able to resume operations when the current crisis ends.

Different aluminum producers are so differently situated that fairness cannot result if Bonneville pursues a "one size fits all" approach to extended curtailments. For example, Golden Northwest shared its power remarketing proceeds with its employees and Bonneville, and is using the remaining funds for new power plants to save its smelters and their jobs. No other aluminum producer agreed to this or does it. Second, each company's costs of "hibernating" for an extended period are different. In addition to continued employee costs, we have other continuing fixed costs from not operating. These costs vary widely from company to company.

We have and will share our cost information with Bonneville and allow BPA to verify our actual "hibernation" costs. We do object, strenuously, to Bonneville paying us anything less than the full amount of our company's "hibernation" costs. We're willing to help in the current crisis, but we can't do so in a way that doesn't cover our costs, and therefore threatens our survival.

It must be remembered, here as in the tiered rates discussion, that each kilowatthour our smelters don't use, and that Bonneville doesn't have to buy, is currently very expensive. After September, my company could and would operate, and our employees would be at work, but for our willingness to extend our curtailment at BPA's request. That extension will save Bonneville and its other ratepayers a huge amount of money.

It would be fair to share the savings of extending our curtailment after October, as we shared the benefits with BPA for remarketing before October. But we do not ask for even that. We do insist, however, on receiving at least enough of those savings to cover our costs of producing the savings for others. That is only fair. And it's essential for us to remain viable during the extended curtailment.

Finally, a two-year extension of the current curtailments beyond September is simply too long. There is no clear need for it: the forward price curve for electric power is not a high plateau, but a line that plunges beginning next spring. In addition, a total of three years is simply too long for a smelter to be shut down. Our employees will move on, our communities will wither, our company will die. We should treat the current power crisis for what it is: a severe emergency of uncertain duration, but not a permanent one.

D. Bonneville Assistance to Non–Federal Resources that Aid Northwest Jobs

My company's smelters were built with Federal encouragement at the sites of two Federal dams, neither of which would have been economical to build without these smelter loads. Yet in a few years, the ever-growing loads of Northwest utilities will have pushed us off the Federal system entirely.

The bell does not toll only for the aluminum smelters. Over half of all electric power in the Northwest is used by industry and agriculture. Low power costs have traditionally been the only significant competitive advantage Northwest industry and agriculture enjoy. Wage rates are high here. Transportation costs are high. Taxes are high. Without abundant and reasonably priced electric power, the lights of factories and of farms will go out all over the Northwest, perhaps never to be lit again. We face a crisis of paychecks, not just utility bills. This is a very real threat that the current power crisis will "de-industrialize" the Pacific Northwest.

If Bonneville, the traditional economic driver of the region, is now going to confine its power supplies to a relatively few favored customers, then Federal power will no longer keep the regional economy healthy. The ample, reasonably priced power will have to come from new, non–Federal power projects. Bonneville has the tools to help support these new, non–Federal projects. We ask that Congress and the Administration urge Bonneville to use them.

In particular, we urge emphasis on Northwest power for Northwest jobs. Every new power plant uses up some portion of the available infrastructure: transmission

capacity, pipeline capacity, water, air. It makes a huge difference to the Northwest whether the power, or at least the financial benefits of the power, from the new project are, or are not, dedicated to saving regional employers and employment. You can't tell, just by looking at a new plant, whether its power and financial benefits flow to Northwest jobs. But you can tell by looking at its books and sales arrangements.

Bonneville's statutory mandate under the Northwest Power Act is to "assure the Pacific Northwest an adequate, economical, efficient, and reliable power supply." The Act gives Bonneville many specific as well as broad powers to assist, stimulate, support, provide transmission and other services to, and help finance non–Federal power plants. Bonneville should do so. In particular, BPA can and should help customers develop new resource by providing credit support through agreements like the Cowlitz Falls payment backup or a "financial sleeve" under which BPA buys power from a new project for up to five years and agrees to resell it to the same customer at the same cost.

BPA should support resource development particularly by traditional customers, such as Golden Northwest, whose Bonneville power is being taken away so that it can be sold instead to utility customers whose loads are growing and who are not building their own new resources to meet that growth. And it should do so with an unequivocal and unapologetic priority for those who, like Northwest Energy Development, are willing to sign on the dotted line and commit to use the power or financial benefits from the new non–Federal projects to save Northwest employers and Northwest jobs. By actively supporting such resource development, BPA can help turn the current power crisis into a win-win opportunity for the future of the entire Pacific Northwest.

Thank you.

Mr. CALVERT. Mr. Settler, go ahead.

STATEMENT OF RANDY SETTLER, SECRETARY, COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

Mr. SETTLER. Good morning, Mr. Chairman, esteemed members of the Committee. My name is Randy Settler. I'm Secretary of the Columbia River Inter-Tribal Fish Commission. I'm a member of the Tribal Council of the Confederated Tribes and Bands of the Yakama Nation and the Chairman of the Yakama Nation's Fish and Wildlife Committee.

I want to thank you both for the opportunity to testify before you today and for your desire to look into this critical situation.

It is not the current water conditions standing alone that are affecting tribal resources in the Columbia River Basin. The real problem is the management decisions made and actions taken by the Federal and state agencies in reaction to the drought. It is these unilateral decisions and actions that are putting the long-term viability of the salmon resource in jeopardy.

The true crisis with long-term implications has been declared in the Columbia River, as well as here in the Puget Sound, where numerous salmon populations are in danger of being lost to this and future generations.

As a region, as sovereigns, we must distinguish between managing for short-term inconveniences and preventing long-term losses. Due to state and Federal reactions to current water conditions, a heightened state of emergency has been created for our shared salmon resources.

Under treaties negotiated with the United States in 1855, the tribes reserved to themselves several rights as sovereigns, among these the right to take fish at all usual and accustomed fishing places. Our people have exercised this right since time immemorial. Our peoples fished during times of drought and during times of

floods, during times of great runs of salmon and during times of low runs of salmon.

As they do now, our chiefs and elders watched over the harvest to ensure that the people cherished and protected the gift of salmon from the Creator. It is our expectation now that the United States will honor the treaties and take the steps necessary to protect our trusted resources.

The extremely low water year does not lower the standard by which the United States must strive to meet to honor those obligations held within the treaties. To honor its commitment, the United States must ensure that there is water in sufficient quantity and quality in the Columbia River and to ensure the safe passage of out-migrating juveniles, as well as for adult salmon returning upriver to spawn.

Under treaties with the Columbia River treaty tribes and with Canada and under its domestic laws and agreements, the United States is obligated to give primacy to the salmon emergency. In order to deal with this ongoing emergency, the tribes believe that—I'd like to point these out. These are, for the record, documents that—we have interacted with the various Federal agencies—that we'd like recognized.

Mr. CALVERT. Those will be submitted for the record, without objection.

[The information referred to is retained in the Committee's files]

Mr. SETTLER. Right. And the Federal agencies, at a minimum, must provide the flow and spill levels for out-migrating juveniles and the returning adults as identified in the tribe's 2001 River Operations Plan, initially presented to the Federal Government in February 2001, with updates in March, April, and May of 2001.

Mr. Wright has promised us a written response for these. We have not received any written response back yet.

Because of the 2001 low-flow conditions, in combination with the Columbia River dams, and the absence of fish protection measures in 2001—these factors will result in very high levels of salmon mortality, whose effects will last for several generations, ten or more years. The Federal Government must develop a mitigation program that addresses the overwhelming impacts the hydropower system will impose in 2001.

To the extent irrigation withdrawals must be limited to meet the flow and spill standards, the Federal Government should mitigate for that impact and explore the potential for reducing irrigation withdrawals in the long term, using a willing buyer and willing seller standard.

The Federal Government must honor its commitments under the 1996 MOA. Unexpended fish restoration monies held in Bonneville Power Administration's financial reserves must be released to the tribes and to the region's fish and wildlife agencies.

The Federal Government must commit to providing the financial resources to implement the 2000 BiOp and "All-H" paper.

The states must maintain their minimum in-stream flow standards and ensure that water quality standards continue to be met.

And in order to reduce the burden of river uses on the backs of salmon, we ask that you support and facilitate the sustainable development of energy resources by the tribes.

I will focus on the flow and spill issues this morning. Flow and spill proposals: Tribal representatives met with Federal agency representatives on several occasions in January and through December 2000, but a meaningful dialogue was never developed on a government-to-government basis.

A list of meeting dates in the BiOp is the only indication that the Federal Government attempted to consult with the tribes. None of our substantial concerns were addressed in the BiOp.

The tribes continue to believe that the four dams in the lower Snake River must be breached to ensure the restoration of salmon in that basin. It is clear from the scientific data collected over years of study that breaching is the only sure course to salmon restoration. If we don't breach the dams, then a very aggressive program of increased flows through the reservoirs and spills at the dams must be pursued by the Federal agencies to increase the survival of juvenile out-migration.

Based on the overwhelming amount of information available from research conducted over the last 30 years, transporting fish only harms; it does not provide any long-term benefits.

I have two more pages. Would you like me to—.

Mr. CALVERT. If you would summarize that, we would certainly appreciate that.

Mr. SETTLER. This year, by declaring an emergency, the Federal agencies are banning the flow and spill proposals they outlined in the BiOp. For the spring, still, the Federal agencies identified 3,600 megawatt months' worth of water as needed to prevent jeopardy to these fish.

Now they have decided to spill less than 10 percent of that level. There's a hitch. They will spill this meager amount of water they promise for fish if they are given the option of taking away spill from the mid Columbia salmon stocks.

In an effort to compromise, the tribes and others have forwarded a proposal of 800 megawatts of spill. The 800-megawatt months of spill in the tribal proposal will provide a more biologically sound "spread the risk" approach.

Mr. Chairman, I have a couple more pages I'd—.

Mr. CALVERT. We'd be happy to accept those for the record. And if you have any closing remark, we would appreciate that so we can move on to the next person.

Mr. SETTLER. I'll reserve my remarks. I hope I get some questions.

Mr. CALVERT. Mr. Settler, we'll get back to you with some questions.

[The prepared statement of Mr. Settler follows:]

Statement of Randy Settler, Secretary, Columbia River Inter–Tribal Fish Commision

Good morning Mr. Chairman, esteemed members of the committee. My name is Randy Settler; I am the Secretary of the Columbia River Inter–Tribal Fish Commission. I am also a member of the Tribal Council of the Confederated Tribes and Bands of the Yakama Nation and the Chairman of the Yakama Nation's Fish and Wildlife Committee. I want to thank you both for the opportunity to testify before you today and for your desire to look into this critical situation.

The Commission was formed by resolution of the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon and the Confederated Tribes and Bands of the

Yakama Nation for the purpose of coordinating fishery management policy and providing technical expertise essential for the protection of the tribes' treaty-protected fish resources. Since 1979, the CRITFC has contracted with the BIA under the Indian Self–Determination Act (P.L. 93–638) to provide this technical support. The Commission's primary mission is to provide coordination and technical assistance to the member tribes to ensure that outstanding treaty fishing rights issues are resolved in a way that guarantees the continuation and restoration of our tribal fisheries into perpetuity. My testimony today is provided on behalf of the tribes.

Treaties of 1855

Under treaties negotiated with the United States in 1855', the tribes reserved to themselves several rights as sovereigns, among these the right to take fish at all usual and accustomed fishing places. Our peoples have exercised this right since time immemorial. Our peoples fished during times of drought and during times of floods, during times of great runs of salmon and during times of low runs of salmon. As they do now, our chiefs and elders watched over the harvest to ensure that the people cherished and protected the gift of salmon from the Creator. It was the expectation of our treaty negotiators then that the tribes would always have access to abundant runs of salmon; it is our expectation now that the United States will honor that commitment and take the steps necessary to protect our trust resource. This reserved right has not been diminished by time and its full exercise has been upheld and affirmed in several U.S. Supreme Court decisions. Yet, our ability to fully exercise this right has been compromised by a combination of state and Federal decisions and management actions focused on the short term.

The fact that we now find ourselves in an extremely low water year does not lower the standard by which the U.S. must strive to meet to honor those obligations; in fact, the drought increases the burden of the U.S. and its agencies to ensure that the salmon resource is protected from further injury and loss. To honor its commitment now means that the United States must ensure that there is water in sufficient quantity and quality in the Columbia River to ensure the safe passage of outmigrating juveniles as well as for adult salmon returning upriver to spawn.

We do not propose this standard in a vacuum, it is a standard we have lived by and under which we manage our fisheries, to ensure this resource will be here for our greatgrandchildren's children. In times of scarcity our peoples have sacrificed to ensure the survival of the salmon: for example, we have not fished commercially for summer Chinook since 1964 and our harvest of those stocks for ceremonial and subsistence purposes has been negligible.

I want to take this opportunity to note that the tribes, working through the Commission, have developed a framework restoration plan, Wy–Kan–Ush–Mi Wa–Kish–Wit or Spirit of the Salmon. This plan documents the threats to our fisheries, identifies hypotheses based upon adaptive management principles for addressing these threats, and provides specific recommendations and practices that must be adopted by natural resource managers to guarantee their trust responsibilities and meet their treaty obligations. In this plan, the tribes have identified the need to insure that the burden of conserving these salmon stocks is allocated fairly across those land and water uses responsible for, their decline. Consistent with this need, we have identified changes that hatchery programs, forestry, hydroelectric development, irrigation, mining and other development activities must make in their operations to ensure the recovery of salmon stocks and fisheries. The tribes' ultimate goal is to restore a sustainable resource for the benefit of all peoples in the Pacific Northwest. Consistent with meeting this goal, each and every beneficiary of the river must make sacrifices in times of shortage, much as the tribes have voluntarily sacrificed fully exercising their right to fish over the last several decades. The tribes now call upon those who would generate electricity and those who would withdraw water from the rivers to now make that sacrifice, or to provide equivalent mitigation when it is demonstrated that such sacrifice is impossible.

At the outset, let me clearly state that it is not the current water conditions standing alone that are affecting tribal resources in the Columbia River basin. The real problem is the management decisions made and actions taken by the Federal and state agencies in reaction to the drought. It is these unilateral decisions and actions that are putting the long-term viability of the salmon resource in jeopardy. In the tribes' view, too much is being made of there being an "energy crisis" or a "water crisis" in the basin; these are real problems but they are short-term in nature. The true crisis, with long-term implications, has already been declared in the Columbia River, as well as here in the Puget Sound, where numerous salmon populations are in danger of being lost to this and future generations. As a region - as sovereigns - we must distinguish between managing for these short-term inconveniences and preventing the realization of the true potential for long-term losses. Due

to state and Federal reactions to current water conditions, a heightened state of emergency has been created for our shared salmon resource.

Under treaties with the tribes, with Canada, and under its domestic laws and agreements, the United States is obligated to give primacy to the salmon emergency. In order to deal with this on-going emergency, the tribes' believe that:

- the Federal agencies, at a minimum, must provide the flow and spill levels for out migrating juveniles and returning adults as identified in the tribes' 2001 river operations plan, initially presented to the Federal Government in February 2001, with updates in March, April, and May of 2001;
- because the 2001 low flow conditions in combination with the Columbia River dams and the absence of fish protection measures in 2001 will result in very high levels of salmon mortality whose effects will last for several generations (ten or more years), the Federal Government must develop a mitigation program that addresses the overwhelming impacts the hydropower system will impose in 2001; 2
- to the extent irrigation withdrawals must be limited to meet the flow and spill standards, the Federal Government should mitigate for that impact and explore the potential for reducing irrigation withdrawals in the long-term, using a willing buyer and willing seller standard;
- the Federal Government must honor its commitments under the 1996 MOA, unexpended fish restoration monies held in Bonneville Power Administrations financial reserves must be released to the tribes and the region's fish and wildlife agencies;
- the Federal Government must commit to providing the financial resources to implement the 2000 BiOp and "All–H" paper;
- the states must maintain their minimum instream flow standards and ensure that water quality standards continue to be met; and,
- in order to reduce the burden of river uses on the backs of salmon, we ask that you support and facilitate the sustainable development of energy resources by the tribes.

I will address each of these issues in turn.

Flow and Spill Proposals

During the development of the BiOp, the tribes attempted to engage the Federal agencies in government-to-government consultations in order to ensure that our treaty reserved rights were protected. And while tribal representatives did meet with Federal agency representatives on several occasions from January, through December 2000, expending considerable time and resources, a meaningful dialogue was never developed on a government-to-government basis. In reviewing the BiOp, a list of meeting dates is the only indication that the Federal Government attempted to consult with the tribes. We believe that none of our substantive concerns were addressed in the BiOp.

With regard to the hydroelectric power system, the tribes continue to believe that the four dams in the lower Snake River must be breached to ensure the restoration of salmon in that basin. It is clear from the scientific data collected over years of study that breaching is the only sure course to salmon restoration. In lieu of dam breaching, a very aggressive program of increased flows through the reservoirs and spills at the dams must be pursued by the Federal agencies to increase the survival of juvenile out migrants. Based on the overwhelming amount of information available from research conducted over the last 30 years, the tribes do not believe that transporting fish provides benefits anywhere near the equivalent of adequate flows and spill.

We advocate flow and spill not because we believe they are the answer to salmon recovery, but because they are the only two management actions at our disposal. They will lessen what promise to be unusually lethal impacts of the hydropower system at a time when salmon stocks in the Snake and upper Columbia River are at dangerously low levels. This cannot be considered enhancement but, at best, damage control.

We have been told that, instead of dam breaching, we will use the next eight years for adaptive management. Yet there is a growing reluctance to use the information and knowledge we have already gathered about the survival of salmon,. let alone utilizing additional information we may learn by conducting additional studies to improve their survival.

Previous Drought Years

This year, the amount of available water for instream flows in the Columbia River basin is expected to be lower than that of 1977, recognized as the worst water year on record. This year, by declaring an energy emergency, the Federal agencies intend

to circumvent the flow and spill proposals they outlined in the Biological Opinion (BiOp) on the Federal Columbia River Power System (FCRPS). This spring, the Federal agencies have proposed to limit spill to less than 10% of that identified in the BiOp as necessary to avoid jeopardizing listed salmon populations. And even this limited action will only be taken if they are granted the option of stealing spill that was to be provided for other salmon populations during the summer. In 1977, even with some flow and spill provided, the National Marine Fisheries Service estimated in river survival of only 2–3% for out migrating Snake River juveniles.

To "alleviate" what everyone recognizes as a disastrous situation for out-migrating juvenile salmon, the Federal agencies propose "transporting" these fish by barge or truck for release below the dams.

Virtually no transported fish returned as adults from the 1977 out migration. In fact, even though fish transportation, as a technical solution, has been in use since 1968, several salmon populations have either disappeared or been listed for protection under the ESA. The tribes believe that the research is in, transportation does not work; the best way to ensure the survival of these populations is by either breaching dams or providing sufficient spill and flow levels.

In 2001; we know how poorly Snake River spring Chinook survived in 1977. We know that during years with favorable river conditions (high flow and spill rates), smolt-to adult returns (SARs) for upriver stocks that must navigate the several dams on the river compare most favorably with SARs for downriver control stocks, those that have no dams blocking their path to the ocean. We know that flow augmentation lessens the impacts of reservoirs and that spill lessens the impacts of dams.

We now know that we would need many millions of acre-feet to approach flow levels even close to the historic hydrograph. Yet, getting back to the historic hydrograph isn't enough. Because the reservoirs behind the Dams Act to slow water velocity several fold, for flow, we would need to increase average precipitation several fold to compensate for the presence of reservoirs. Even in normal years, this would be impossible.

Clearly the flow augmentation targets proposed by the Federal agencies in the BiOp are inadequate. Yet, this year the Federal agencies refuse to provide even those levels, as a result, flows are now half of the BiOp targets. And the safest avenue for fish, providing for spill over the dams, is now subjected to drastic curtailment or complete elimination in order to provide water for power generation.

Spring Spill

While we should at the very least be able to count upon the Federal agencies to meet the goals and objectives they set for river management in the BiOp, it appears as though neither the tribes nor the salmon can count on them making any effort to restore salmon. The legally mandated spill at Federal dams in the Columbia and Snake rivers as described in the BiOp have been abandoned, plunging already weakened salmon runs through the most lethal routes in the river system. Without spill, the salmon resource is left to turbine passage, mechanical bypass and transportation with all of their uncertainties.

For the spring out migration, the BiOp called for 3600-megawatt (mw) months worth of spill as a reasonable and prudent alternative (RPA) that would help to preclude jeopardy to the listed salmon populations. Declaring an emergency, the Federal agencies initially claimed that the best they can now offer at this critical time for the salmon is 300 mw months of spill, or less than 10% of the RPA. Even this drastically reduced level of spill is contingent upon compromising spill regimes later in year, with the potential for putting other salmon stocks at risk.

In an effort to compromise, the tribes and others have forwarded a proposal for 800 mw months of spill. The 800 megawatt months of spill in the tribal proposal provides a more biologically sound, "spread the risk" approach for migrants reaching the lower Columbia. The tribal proposal calls for a fraction of the spill - approximately 8 days versus 62 days- required in the 2000 Federal Biological Opinion. The tribal "spread the risk" strategy would provide salmon several passage routes in the face of the uncertainties surrounding this year's river conditions.

The tribes continue to reject the Federal proposal to swap summer spill at mid–Columbia dams for spring spill in the lower river - an inappropriate and irresponsible trading of risk from one stock to another. The Federal proposal would force parties to walk away from a historical spill settlement agreement that took a decade to negotiate and finalize.

State Management Actions and Obligations

Water is an extremely limited resource and the rivers throughout the region are already over-allocated due to poor management by the states. While these waters

serve other important uses and users, they are fundamental habitat for salmon. Salmon need these waters for instream flows. Our treaties, and the Federal and State trust responsibility to the tribes under our treaties, as well as the Endangered Species Act and the Clean Water Act, are there to protect these resources.

A sufficient level of water is simply not available for all the uses being proposed by the various user groups, especially during these times. States should consider providing, and the Federal Government should consider supporting, funding incentives for setting or amending instream flows to levels higher than the current flows where necessary to ensure that these flows are adequate to meet the needs of fish.

The States should provide more funding to allow responsible agencies to follow through on the states' legal responsibility to establish instream flows. Sufficient funding should also be provided to ensure that the agency could enforce these flows each and every year, especially in drought years. Current state funding levels fall woefully short of the amount needed to fulfill these responsibilities in a legitimate, scientific manner.

While these issues are shared by each state, in light of the location for this hearing, I will highlight as an example an issue in the State of Washington.

In 1980, the State of Washington had the foresight to reserve instream water rights to protect fish habitat and public health. But, under the same law, the State is allowed to reduce these flows in cases of "overriding public interest." On April 5, 2001 the Washington Department of Ecology (WDOE) exercised this discretion and authorized a critical flow adjustment, reducing designated instream water flow levels by 23% in the Columbia River. This action was apparently taken in order to avoid cutting off the access of junior appropriators, permitting even irrigators with rights secured after 1980 to withdraw water in this drought year. The tribes do not believe that decision was taken in full consideration of the public interest. By law, water conservation is a public interest, and the burden of further conservation should be "shared by the various users to the greatest extent practicable." By reducing instream flows, however, Washington is not allocating the burden between users. Rather, the State of Washington is benefiting private economic interests over public interests.

The tribes are concerned that, by taking this action that favors irrigation needs exclusively over the needs of fish, the State of Washington is not honoring its obligations to rebuild naturally spawning stocks of anadromous fish as required under US v. Oregon, the Chinook rebuilding program of the U.S.–Canada Pacific Salmon Treaty, and the Northwest Power Act. Obviously, the State's action in reducing instream flow levels will not benefit salmon. Every cubic second foot of water available for instream purposes is more valuable in a drought year than in a year of normal runoff.

In this specific instance, under the terms of their permits, the junior water right holders were aware that their rights could be curtailed at least once in every 20 years for instream flow purposes. These rights were conditioned upon volume runoff forecasts, subsequent water development occurred based upon that condition. This year was the first time that junior rights holders faced that potential since Washington established instream rights in 1980. The junior permits were specifically made conditional upon volume runoff forecasts and subsequent water development occurred based on that condition. This would be an appropriate year to restrict these diversions to protect instream uses. Yet the State chose to let them withdraw water this year anyway.

In addition, this decision has a cumulative impact: further reducing instream flows reduces the volume of water available for hydroelectric production and for spill for salmon and will adversely affect the region's interest in both these instream uses.

The State of Washington must take affirmative actions to rebuild salmon runs, even during low flow years, to protect the treaty fishing rights of the tribes. The State has not demonstrated that it has a plan to restore salmon to meet the tribes' fishing needs or that it can mitigate for reducing instream flows this year.

Again, my intent is not to single out the State of Washington: in the State of Idaho, the Nez Perce Tribe is involved in the lengthy water allocation negotiations in the Snake River Basin Adjudication. The State of Oregon faces some of the same problems as Washington in ensuring adequate instream flows for fish, as well as ensuring that water quality standards are met each year. The tribes are willing to work with each one of these States to find ways to assist the junior appropriators, so long as any mitigation will not reduce instream flows. The tribes also believe that the States can mitigate for some of these impacts by working with the tribes to reform artificial propagation policies. We continue to believe that such reforms will help to assure rebuilding Columbia River salmon runs to sustainable, harvestable levels for tribal and non-tribal fishers.

Tribal Management Proposals

The tribes have long recognized that co-management in harvest arenas alone will not address one of the most significant problems facing Pacific salmon: the loss and degradation of their ecosystems. To address this major problem, the tribes have developed Wy–Kan–Ush–Mi Wa–Kish- Wit, or The Spirit of the Salmon, a salmon restoration program focused not on a single salmon stock or species, but instead on the integrated habitat characteristics that make up a healthy watershed. The tribes believe that implementation of their plan will result in healthy, sustainable salmon fisheries from Southeast Alaska to the headwaters of the Snake River Basin. To protect and recover tributary habitat, the plan proposes that land and water managers meet a series of habitat conditions associated with survival rates. The use of this "Coarse Screening Process," where applicable will define allowable levels of watershed impacts consistent with salmon restoration.

The tribes' salmon plan calls for baseline surveys of watershed and in-channel conditions as well as trend monitoring to document watershed recovery, test assumptions and validate models used in land management. Monitoring needs include egg-to-smolt survival, total smolt production, and production per spawning pair in salmon-bearing watersheds. Physical monitoring needs in all salmon-bearing watersheds include measuring substrate sediment loads, large woody debris, pool frequency, and volume, bank stability, and water temperature.

Adaptive management is a hallmark of the tribes' salmon plan, which takes a gravel-to-gravel approach to achieve improvements in survival throughout the salmon life-cycle. The tribes' science-based approach to land management is supported by independent scientific peer review. To halt salmon declines and rebuild healthy runs, the USFS and BLM must likewise implement science-based adaptive approaches that integrate biological and physical monitoring with land management actions that protect and restore salmon habitat.

The tribes' plan calls for an expedited program of watershed restoration actions for the Columbia Basin. The tribes are working in partnership with state, Federal, and local governments as well as private landowners to establish a comprehensive program for implementing actions that will restore functioning ecosystems in our watersheds. We have developed watershed restoration action plans for the 23 salmon bearing watersheds above Bonneville Dam in the Columbia Basin. Many of these actions will be carried out on private lands.

State and Federal hatchery management programs contribute to the extirpation of naturally spawning salmon stocks in the basin. The tribal goal to put fish back in the river means literally putting the fish back. Young salmon, if released at the proper time, will return as adults to spawn in the same area they were released as juveniles. Consistent with this concept, the tribes, working with the state and Federal fishery agencies, developed a supplementation protocol so as to reform hatcheries to rebuild naturally spawning salmon populations in the basin. Utilizing this protocol, the tribes developed integrated production plans that can be implemented as research projects to restore naturally spawning populations using carefully monitored supplementation practices. Under tribal management, hatcheries would be used for the restoration of naturally spawning Chinook stocks throughout the Basin.

The tribes and the Commission, working with the state and Federal fishery agencies, developed a flow program at the dams that would help restore salmon by providing sufficient river flows for migration. This flow program enhances and ensures the benefits from protecting and restoring watershed systems and reforming hatchery programs. In this way can we rebuild salmon populations to harvestable production levels rather than continue the status quo and preside over their demise.

The tribes' plan covers all the areas that must be addressed in order to protect salmon stocks and insure their restoration to levels consistent with the international obligations of the United States and with its trust obligation to the tribes; but that will be the easy part: the most difficult obstacle facing the restoration of the salmon runs is the lack of political will to tackle the issues head on. We will do everything necessary to insure that these runs will be rebuilt.

Conclusion

The salmon resource, and with it, tribal rights reserved under treaties with the United States must not be the last priority of the list of considerations reviewed by the state and Federal Governments when river management decisions are being made. To alleviate this burden, the tribes ask that you ensure that other river users are bearing their fair share of the conservation burden. We would also ask for your support of a National Tribal Energy Bill, which will foster expedited energy resource development on tribal lands and provide the Northwest tribes the opportunity to

help alleviate the burden of energy reliance on the Columbia and Snake rivers by the rapid development of new cost effective power supplies to serve Northwest loads.

1 Treaty with the Yakama Tribe, June 9, 1855, 12 Stat. 951; Treaty with the Tribes of Middle Oregon, June 25, 1855, 12 Stat. 963; Treaty with the Umatilla Tribe, June 9, 1855, 12 Stat. 945; Treaty with the Nez Perce Tribe, June 11, 1855, 12 Stat. 957.

2 The Bonneville Power Administrations 2001 Action Plan project solicitation is limited to actions that have already received necessary state and Federal permitting and can be implemented "on the ground" by September 30, 2001. While we do not object to this solicitation, we recognize and BPA recognizes that the terms of this solicitation so limit the projects BPA can consider, that these projects cannot possibly offset the impacts of the 2001 hydro operations on Columbia Salmon runs. Looking at this issue from a different perspective, BPA will avoid nearly $2 billion in costs by foregoing salmon operations in 2001, whereas the 2001 Action Plan solicitation is likely to result in $10 to $20 million in mitigation project funding. To further place this solicitation in perspective, to implement the FCRPS Bilogical Opinion and NPPC Fish and Wildlife Program, we estimated that over $200 million in new BPA funding would be needed in 2001.

Mr. CALVERT. Dr. Karier, you may begin your testimony.

STATEMENT OF DR. THOMAS KARIER, CHAIRMAN, POWER COMMITTEE, NORTHWEST POWER PLANNING COUNCIL

Mr. KARIER. Thank you, Mr. Chairman, and members of the Subcommittee.

My name is Tom Karier, and I'm one of two members of the Washington delegation of the Northwest Power Planning Council, and I also serve as chairman of the council's power Committee.

Thank you for the opportunity to speak here on behalf of the council. We are an agency of the states of Idaho, Montana, Oregon, and Washington. Under the Northwest Power Act of 1980, the council conducts long-range electric energy planning and analysis and also prepares a program to protect, mitigate, and enhance fish and wildlife for the Columbia River basin that have been affected by the hydropower dams.

The council has been conducting an ongoing analysis of the West Coast electricity crisis, and from our analysis, it appears the crisis has five key causes, causes that have been characterized as comprising that perfect storm.

First, the competitive wholesale power market has been characterized by excess capacity and an abundant hydroelectric power for most of the—of the mid to late 1990's. And it did not provide a price signal sufficient to encourage new investments in new generating and conservation resources.

Peak summer loads grew by almost 12,000 megawatts in the West between 1995 and 1999, while generation capacity increased by only 4,500 megawatts.

Second, below-average rainfall and snowpack in 2000 and 2001 have dramatically reduced our recent hydropower supply by almost 5,000 megawatts. That's equivalent to the power needed for four cities the size of Seattle. We are facing the second-worst drought on record.

Third, the price of natural gas, the primary fuel for thermal power plants in the Northwest, has more than doubled in the last year, largely as a result of supply and demand, including increased competition with the Midwest for existing natural gas supplies.

Fourth, planned and unplanned maintenance of thermal power plants in the Northwest, but especially in California, have reduced the power supply.

And fifth, production from the hydroelectric system has been affected by efforts to recover salmon and steelhead listed under the Endangered Species Act, although emergency operations this year are returning much of that power.

Obviously, a lack of rainfall is having the largest and most immediate impact. Based on our analysis, we offer the following observations and recommendations: Bonneville should continue the emergency hydropower operations it began in February. This means drafting reservoirs below biological opinion target levels for this time of year in order to generate more power.

New power facilities are coming on-line in the near future, and these will help ease the crisis. More than 700 new megawatts are scheduled to come on-line in July alone.

We are also encouraged that renewable resources—particularly wind power—are being developed aggressively in the region. The regional utilities and industries also are installing temporary generation to help them through the summer and fall, when we expect prices will continue to be high.

At the same time, we see encouraging developments in energy conservation, demand exchanges between utilities and the customers, and economic incentives. But we still anticipate high current prices that will continue for us for another year, at least, perhaps longer.

But when prices moderate and supply increases, we must not lose sight of the need for a longer-term policy that helps us deal with future crises.

For example, state utility regulators should explore power pricing changes to reflect market prices and risks. If consumers saw realtime prices, they would have much more incentive to reduce conservation and invest in energy efficiency measures.

Consistent with our responsibilities to the Northwest Power Act, the council is concerned about the impact of the drought on fish and wildlife in the Columbia Basin, as well as the impact on the nation's power supplies.

The critical issue this spring is whether to spill water over dams to help juvenile salmon and steelhead migrate to the ocean. Spill is required, by the biological opinion, on hydropower operations issued by the National Marine Fishery Service, but water that is spilled cannot be used to generate power.

The council has advocated for hydropower operations that ensure energy reliability in the Northwest and to use any additional water storage to provide the best benefit for Columbia Basin fish.

In April, we addressed the spill issue with our own recommendations for dam operations this spring and summer. In short, we recommended that the spill be eliminated at the four dams where fish can be collected and put in barges. We recommended that limited spill be provided at Bonneville, the Dalles, and John Day Dams to help fish migrate once energy adequacy is assured.

We believe these operations would provide the best balance of power generation and fish protection in this difficult drought year.

Mr. Chairman, we have an opportunity to fix the current problem while also investing in the future.

Thank you, again, for the invitation to address the Committee today. Thank you.

Mr. CALVERT. Thank you, Tom.

[The prepared statement of Dr. Karier follows:]

Statement of Dr. Thomas Karier, Washington Member, Northwest Power Planning Council

Good morning Mr. Chairman, and members of the Subcommittee. Thank you for the opportunity to testify today on behalf of the Northwest Power Planning Council. My name is Tom Karier, and I am one of Governor Gary Locke's two appointees to the Council. I also chair the Council's Power Committee, which includes one member from each of the four Northwest states that are represented on the Council.

The Council is an agency of the states of Idaho, Montana, Oregon and Washington. Under the Northwest Power Act of 1980, the Council conducts long-range electric energy planning and analysis, and also prepares a program to protect, mitigate and enhance fish and wildlife of the Columbia River Basin that have been affected by hydropower dams.

For nearly two years, we have been conducting periodic reviews of the West Coast power crisis and the high wholesale market prices, an effort we began in 1999 as the signs of an impending power problem began to make themselves evident. Today I will share with you the conclusions of our latest analysis and our recommendations for alleviating the crisis.

To begin with some background, we believe five key events are contributing to the current crisis.

First, as the result of the nationwide wholesale electricity deregulation authorized by the National Energy Policy Act of 1992, the risk associated with the development of new generation resources was placed on independent developers. These independent developers must believe they can recover their costs and earn a reasonable return before they will invest. The excess capacity and abundant hydroelectric power that characterized Western power markets through most of the mid to late '90s did not provide price signals sufficient to encourage investments in new generating and conservation resources—at least not until prices jumped up last year. As a result, construction of new power plants and new conservation and renewable resources during the last decade did not keep pace with growing demand for electricity. Throughout the entire Western Systems Coordinating Council area peak summer loads grew by almost 12,000 megawatts between 1995 and 1999 while generation capacity increased by only 4,500 megawatts.

California's experiences with its own deregulation law have exacerbated the supply and demand problems and helped to drive up wholesale power prices throughout the West to levels never seen before.

Second, below-average rainfall and snowpack in 2000 and 2001 have dramatically reduced our region's hydropower supply. So far, 2001 is the second-driest year on record in the Northwest, and with normal operations our region's hydropower generating capacity is reduced by about 5,000 megawatts—enough power for more than four cities the size of Seattle. Runoff in the Columbia River Basin is predicted to be 56.5 million acre-feet, just 53 percent of normal. There also is bad news from north of the border, where the Canadian Columbia River Basin is experiencing rain and snowfall far below normal. This reduces the amount of power that can be generated both in British Columbia and downstream at dams in the United States.

Third, the price of natural gas, the fuel of choice for thermal power plants in the Northwest, has more than doubled in the last year, largely as the result of supply and demand issues, and also competition with the Midwest.

Fourth, planned and unplanned maintenance of thermal power plants, both in the Northwest and in California, reduced the power supply, as did plant shutdowns to comply with air quality requirements.

Fifth, the loss of flexibility in the operation of the hydroelectric system due to Endangered Species Act requirements has derated the system by more than 1,000 megawatts.

We are most concerned about the present condition of the Federal Columbia River Power System, which provides about 40 percent of the electricity in the Northwest. It is a system that runs on water, of course. And right now the water supply in the Columbia River Basin is low. I want to make it clear that for us in the Northwest, the crisis is not just about a failure to build new power plants. It is a crisis of fuel supply, and for us, fuel means water.

The Northwest is a hydropower-dependent region. In an average year, approximately 75 percent of the electricity generated in the region comes from hydroelectric dams. Frequently in the fall and winter we import power from California to help meet our load. These power imports during the low-flow winter months help us store water in reservoirs for spring fish flows. Storing water also helps us meet our demand for power in the spring and summer and make surplus power available to California.

Good hydropower conditions during the last several years masked the growing imbalance between supply and demand. Last winter and this spring, poor hydropower conditions in the region combined with California's ongoing supply crisis are exacerbating the imbalance between supply and demand and making our dependence on hydropower all the more clear. Not only are we concerned about having enough electricity if the remainder of the spring and summer are warmer and drier than usual, but we also are concerned about the impact of low flows and reduced water spills at dams on juvenile salmon and steelhead migrating to the ocean.

The power crisis is affecting Northwest electric utilities and ratepayers, as well as those in California, and particularly businesses and industries. Utilities are raising their rates, dramatically in some cases. The Bonneville Power Administration may have to buy power on the spot market next fall if expected new contractual obligations increase its load by as much as 3,000 megawatts. Earlier this year, Bonneville proposed rate increases to cover the additional cost averaging 60 percent and, for some customer classes, exceeding 90 percent. With the situation further deteriorating, Bonneville is working to keep the rate increases in double figures, a goal that would have sounded absurd a year ago.

Businesses and industries are shutting down or cutting back. In many instances, the cost of power exceeds the value of the product produced. The aluminum industry and some irrigated agriculture are prime examples. In these instances, the power has been purchased back from the consumer or, in some cases, the consumer has been able to remarket the power.

What can be done?

Based on our ongoing analysis of the power supply and market prices, we developed the following observations and recommendations:

First, Bonneville should continue the emergency hydropower operations it began in February. This means drafting reservoirs below Biological Opinion target levels for this time of year in order to generate more power. The emergency hydropower could be augmented with imports, if possible, and also by reducing spill. This would keep reservoir elevations a little higher, and that is an important consideration for our power supply later this year.

Second, new power plants are under construction in the Northwest, and these will help ease the crisis. More than 1,100 megawatts of new generating facilities will begin producing electricity by July, and about 700 megawatts more will be operating by the end of this year. In 2002, some 1,700 additional megawatts of new generation is expected to begin operating. Meanwhile, natural gas usage in the Northwest, both for homes and businesses and as a fuel for power plants, continues to increase. But supply has not kept pace with demand and, like wholesale electricity, prices for natural gas have continued to increase—although recently prices fell back to $5–$6 per million Btu. That is still about three times as expensive as a year ago. The Council estimates that demand for natural gas will continue to grow at about 2.3 percent per year. Gas companies are working to increase the supply, and pipeline companies and their customers are working to increase capacity.

Third, we are encouraged that renewable resources, particularly wind power, are being developed aggressively in the region. Two new wind power developments will yield 325 megawatts of capacity in the next year or so, and planned hydropower upgrades in the Northwest will yield an additional 80 megawatts of capacity. Of the anticipated 1,800 megawatts of new power expected this year, 200 is wind power from a site in southeastern Washington.

Fourth, temporary new thermal generation is being installed by utilities and industries that use large amounts of power to help get through the anticipated high prices this year and next. About 500 megawatts of temporary, peaking thermal plants will come online this year. We recommend that permits be issued for these plants if they 1) meet minimum environmental-protection criteria, and 2) are authorized only for limited time, after which the plants could continue only if approved through normal siting process.

Fifth, efforts to improve energy-use efficiency must accelerate. The Council always has defined conservation as improved energy-use efficiency—not as an exercise in personal sacrifice such as living in a colder house or taking luke-warm showers. To the Council, conservation means using energy more efficiently to do the same amount of work. Our staff has identified a number of promising efficiency efforts,

including the following: 1) replace incandescent bulbs with compact fluorescents; 2) upgrade commercial lighting; 3) "tune up" heating/air conditioning systems in commercial buildings; 4) replace inefficient industrial electric motors; 5) retire second refrigerators in homes (20 percent of Northwest homes have two; old ones use twice as much electricity as "Energy Star" models); and 6) accelerate replacement of existing clothes washers ("Energy Star" models use 35 percent less electricity and 35–45 percent less water).

Sixth, pursue industrial/commercial demand reduction. This is a separate area of efforts to improve energy-use efficiency, and it has huge potential. Our staff has identified the following methods: 1) utilities should negotiate interruptible power-supply contracts with their largest customers, where this is possible; 2) utilities should investigate new contractual mechanisms like demand-exchange programs; and 3) utilities should investigate buying back power from these customers for short periods of time. There is good progress to report in this area. Northwest industries have agreed to reduce their demand for power by about 1,000 megawatts. This will be accomplished through short-term contractual arrangements that include power buybacks by utilities, industrial shutdowns and remarketing of power supplies by industries. Utilities also have arranged an additional 800–900 megawatts of demand reduction agreements, primarily with industries, in which the power customers agree to reduce their power usage in return for a payment or credit.

Seventh, and for the longer term, state utility regulators should explore power pricing changes to reflect market prices and risk. Most consumers don't see real-time (marginal cost) prices. If they did, they would have more incentive to reduce consumption and invest in energy efficiency measures. Most consumers do not want to be exposed to the volatility and risk of real-time prices. However, creative rate design and new metering technologies can promote greater price response without punishing the consumer.

Eighth, new energy policies also should be explored. But these can be controversial. For example, price caps on wholesale power have been proposed. The Council has not taken a position on price caps because the governors of the Northwest states do not agree on the issue. Two governors believe that temporary price caps are needed to address the severe economic impacts of high power prices. The other two governors believe that price caps will create uncertainty in the market and serve as a disincentive to the development of new generation and conservation.

Ninth and finally, we all must continue to inform the public about the problem. The public needs to understand the problem is real and that efforts at home will help ease the crisis.

Now Mr. Chairman and members of the committee, I would like to discuss the impact of the energy crisis on fish and wildlife of the Columbia River Basin. While the Council has a statutory responsibility to assure the Pacific Northwest an adequate, efficient, economical and reliable power supply, our planning also must protect, mitigate and enhance fish and wildlife affected by hydropower dams in the Columbia River Basin. The near-record low snowpack runoff this year has the potential to have adverse effects on fish as well as power, and particularly juvenile salmon and steelhead that migrate to the ocean during the spring and summer.

The Council's planning responsibility under the Northwest Power Act, and also the responsibility of the Federal agencies that operate dams in the Columbia River Basin and sell the power, is to provide equitable treatment to fish and wildlife with other purposes of the dams. Those other purposes include navigation, irrigation, recreation and flood control.

In April, the Council recommended operating strategies for Columbia and Snake river dams that would eliminate water spills at most dams this spring and summer in order to make more water—and, therefore, more power—available later in the year. This policy would be adjusted as water conditions or the power situation evolve.

This is controversial, to say the least.

The 2000 Biological Opinion on the operation of Columbia and Snake river hydropower dams, issued by the National Marine Fisheries Service on behalf of threatened and endangered species of salmon and steelhead, calls for spilling water over the dams this spring and summer to help juvenile fish migrate to the ocean. Spill is an effective method of moving juvenile fish past dams, but water that is spilled cannot be run through turbines to make electricity.

The Council's technical analysis of the impact of drought on the power supply in 2001 suggests that reducing spring spill at some dams and eliminating it at others would 1) help reservoirs refill by the end of summer to levels specified in the Biological Opinion; 2) potentially reduce summer power prices if surplus power can be generated; 3) reduce the risk of power supply problems next winter; and 4) help ensure adequate water storage to aid juvenile fish migration next spring.

Based on the analysis, the Council made the following recommendations:

- Barge juvenile salmon and steelhead this spring and summer.
- Do not spill water at the four dams where fish can be collected and put in barges. These dams are Lower Granite, Little Goose and Lower Monumental on the Snake and McNary on the Columbia.
- Spill a limited amount of water at John Day, The Dalles, and Bonneville dams, where fish cannot be collected for barging.
- If spill is reduced or eliminated, Bonneville should set aside a portion of the income from the sale of additional power to pay for projects that mitigate the impact of this year's drought on fish.
- Place a high priority on refilling storage reservoirs to Biological Opinion target levels by August 31 in order to protect the winter power supply and ensure enough water for the fish migration in 2002.
- Purchase power and water from irrigators who are willing to sell, in order to leave more water in the rivers for fish.

In conclusion, Mr. Chairman and members of the subcommittee, where do we go from here?

First, this crisis will end, but not right away. During the next two years, new generating plants, new conservation and new renewable energy will be coming online in the Northwest. Creative demand-reduction agreements are being implemented by utilities and their largest customers. Utilities are installing temporary generating plants to help them through the summer, at least, and maybe through next winter as well. The Council does not oppose these plants, but believes they should be temporary. These will produce power at a lower cost than power on the volatile wholesale market.

Conservation efforts including replacing incandescent light bulbs with compact fluorescent bulbs, replacing inefficient industrial motors, and the other things I mentioned could save the region more than 240 megawatts, according to our analysis.

The Council's recommendations amount to a call for the West to fix the current problems while investing in the future. We must ensure that utilities and consumers remain financially solvent until new sources of generation and demand reduction moderate prices.

Perhaps the only good thing that can be said for the current crisis is that it offers the West an opportunity to think carefully about our future power supplies and take steps to ensure adequate investments in new thermal generation, and also in new conservation and renewable energy. These developments would be aided by a coordinated effort to streamline siting processes throughout the West so that we retain the essential environmental and community safeguards while avoiding unnecessary delays.

Mr. Chairman, that completes my testimony, and I would be pleased to answer any questions.

Mr. CALVERT. Mr. Klein, do you believe that Bonneville should have overprescribed when they were making their power project?

Mr. KLEIN. I understand the circumstances they were in, but--.

Mr. CALVERT. Then why did they do it, in your opinion?

Mr. KLEIN. Well, I think lobbying and political pressure.

Mr. CALVERT. Lobbying by whom?

Mr. KLEIN. A number of different entities that felt that they were entitled, based on the benefits to those industries, to help the economy.

I think I agree with Steve Wright that probably, at the time, the belief was that expanding of the pie can be done without damage. Specifically, looking back, if we gave away far more of the pie, then—.

Mr. CALVERT. Obviously, that had an impact on your customers?

Mr. KLEIN. Certainly, and will continue to have.

Mr. CALVERT. And obviously—Mr. Wilcox, I sympathize. I've been in business most of my life. I can understand that—probably that it's not—even though someone is paying your—your employees, it's difficult to shut a business down for a couple of years. I imagine

you're very concerned about your customers, where they're buying product at the present time, how you rebuild that customer relationship again, what kind of—what do you do in this interim period of time while you're basically down?

Mr. WILCOX. Yeah. Our particular company's problem is that we have a contractual obligation to operate, a supply of customers. We have a holding arrangement for our raw materials, alumina. We're supposed to take some of the alumina, smelt it into aluminum, and provide a factory aluminum.

So I'm contractually obligated to operate for this 9-month period. I was able basically to buy my way out of that obligation.

And our concern is that we can't do that if the curtailment gets extended further. And that's one of the costs we have.

Mr. CALVERT. Yeah. Part of that is you could not do that beyond 2 years.

Mr. WILCOX. Right now we did an agreement to buy ourselves out of that supply obligation (inaudible) for 9 months to extend our curtailment beyond October, after we negotiated that. We haven't been able to do that yet.

Mr. CALVERT. What's happening, like, for instance, with your raw resources, on that end of it?

Mr. WILCOX. We basically have to buy it and resell it at a depressed market price.

Mr. CALVERT. Mr. Settler, talking about, obviously, breaching dams in the Snake River, what type of solution would you have to make up for the lost hydroelectric power that we lose in a situation such as that? Do you have any solution for that?

Mr. SETTLER. Well, I think you have people here better able to answer that question. They have the responsibility to answer that question. My obligation—I uphold the treaty of 1855 to protect those resources. Certainly, we had these conditions that have existed in the past, and it shows, and it reflects, the record of the people that are responsible, that they did perform the duties that they were supposed to perform.

Mr. CALVERT. Now—.

Mr. SETTLER. And so my responsibility is to protect these resources and rebuild them to meet our treaty obligations. And so if we don't breach these dams, then we have to provide the needed flows from the added spill to ensure their survival. It's not happening.

Mr. CALVERT. Now, you don't believe that the technology and the methodology that's been used in barging smolt salmon is a proper solution? Of the reports that I've read—that—that a significant amount of juvenile salmon are, in effect, being able to be put up, and factually, they do not damage a larger population, especially in a year like this.

Doesn't the biological opinion allow for that to occur and to stop the spilling in the—in some (inaudible) in order—for emergencies such as this in this region, where the power can be turned on, and allow this region to—to continue to operate?

Mr. SETTLER. Sir, most of the collection facilities are at the Snake River, and they barged a lot of those smolts. In 1977, when they started this program, it was a similar drought condition.

Mr. CALVERT. Hasn't the technology improved significantly since 1977?

Mr. SETTLER. Well, I think there's been some improvements, but there is still no indication that it's brought back an increased number of fish. There's no scientific evidence that supports that, sure, they can collect more smolts.

When the dams—when the smolts go out, they're trapped in the facility. They don't experience natural conditions. Right now we're looking at smolts trapped behind these dams. We just met with the Columbia Basin Fish and Wildlife Authority, and people were saying, "We're going to barge every smolt we can on the Snake River.".

The Idaho state manager got up and said, "Great. How are you going to get them to the collection facility, because there is no water going through the system? They can't even make it to the collection facility.".

So yeah. You can say—you can barge every smolt that you get to the collection facility, but they can't make it. It's the same way with the upper Columbia River stocks right now. They're not making it through the system. We've got estimates of 30 percent through the system. 50 percent of the smolts should have went out by now.

The smolts that we're talking about are from last year's—about 200,000 run of spring chinook. That was a very good run. Millions and millions and millions of dollars have been spent on trying to rebuild these runs.

The Yakama Nation—we've got 30-—30,000 wild chinook coming back from the Yakima River, where we manage. That's--.

Mr. CALVERT. My time has expired.

We have an extraordinary year, here. We're trying to find a reasonable solution to this. I know Mr. Karier probably will have a comment on how we may be able to work out a solution. And I will come back to that.

In the meantime, Mr. Smith—.

Mr. SMITH. Thank you, Mr. Chairman.

Actually, (inaudible) example of the problem that we have. Because the wholesale power market is so expensive right now, we'd like to be able to generate as much hydropower as humanly possible so that both of you can stay in business, frankly.

The problem with generating that amount of hydropower is that, A, we don't have the water; and B, we have salmon concerns, as Mr. Settler pointed out: The more of that water you spill over the dams, the barging, at best, has had a mixed record. No matter how you look at it, it's not as good as the natural way of the salmon going up and down the flows; and we have legal and—obligations involved—legal obligations.

So I guess what—in the long term, in the next year or two, it makes a lot of sense to build as much more generation as we can get. I don't think that all has to be natural gas power plants. There are other ways to go. Short-term gas is (inaudible).

I want to ask Mr. Wilcox—my understanding is your plan is to make the aluminum company sort of energy independent in the next two or 3 years.

Can you tell us a little bit about the—by "energy independent," I mean not dependent on Bonneville anymore.

Can you tell us a little bit about that?

Mr. WILCOX. Yes. When we entered into our new marketing agreement last December, where we sold our power for the 9 months, until October, we agreed that we'd invest the proceeds back into building new power projects to suit our needs.

We also agreed that we would co-op the Bonneville system altogether in 2006. So basically, we have a window of opportunity between now and 2006 to build power projects to (inaudible) we won't directly get any power from Bonneville.

So we are independently pursuing three resources. We're putting in a project, a gas fire project, at the Golden Dalles smelter site that would be in operation February 2002, very fast track.

We are very actively developing a large amount of wind generation in the eastern end of the Columbia Gorge. I've become a believer in wind generation. And given the high price of natural gas, you have to have a diversified portfolio to have reasonable power costs.

And third, we're just at the very early stage of a siting on another large natural gas spot (inaudible) Oregon. And if we could get those three projects done, we will have an economical supply of power long term. Given our natural gas crisis, it won't solve all our problems, but it will—should make the future a lot better than having no Bonneville power after 2006.

Mr. SMITH. And it's just a matter of getting you there, basically. That's a big--.

Mr. WILCOX. Yeah. You know, what we plan to do basically is use this 5-year period between 2001 and 2006 as a bridge where you could buy—and have half of your power needs met by Bonneville while you built the power projects, so come 2006, you don't have—the problem we face now is if we curtail for 2 years, we have to use our marketing proceeds to cover our losses during the curtailment. We wouldn't have any resources for any power projects, which would kill us in the long term. So we have to still have—as a bridge—so we can build our power projects to get off the—the Bonneville system so that the power is available for—.

Mr. SMITH. How much of your power do you get from Bonneville, and how much of it do you have to get from the open market right now?

Mr. KLEIN. Currently, under the existing contract, we get 12 percent of our needs met by Bonneville Power Administration.

Mr. SMITH. Yeah. That's a—fairly—quite a lower number than I would have expected. I thought, as a public utility, you had priority. Why such a low number?

Mr. KLEIN. Back in the mid 1990's, Tacoma Power voluntarily—one of the first utilities in the nation to voluntarily allow our large industrial customers open access to go to the market. And part of that was making an arrangement with Bonneville to allow them to go. So they went. The marketing, as you know, did quite well the first 2 years and then has been hammered very hard for the last year.

Mr. SMITH. So you have large exposure to the wholesale market? I guess that what all this is, two, 3 years from now, when they get there—and I think there are certainly some broader energy questions—I think we need to be careful about totally relying on our

natural gas generating plants and that there are some broader issues that are in the jurisdiction of the Committee.

But the real question is, for all of us, how do we get through the next year or 2 years? And it seems to me that all of this argues rather strongly that FERC,the regulatory agency that has the authority to step in and try to help out, needs to do something or, you know, you run the risk of either, you know, charging customers an incredible amount or to have significant increases and going bankrupt.

Northwest—I mean, your company stares in the face of the possibility of not being able to be around anymore if we can't get ahold of the power for the next couple of years. And the damage to the fish is overwhelming. And it all comes back, to a certain extent, to the exposure to the wholesale market and also to the fact that we are not maximizing our current supply.

Now, I don't know what FERC's authority is to come in and tell people to generate power, but they certainly have authority to control the prices if they see fit. If they don't do it—.

I think you three gentlemen now sort of described a lot of the very negative consequences that are going to happen. I guess for any future panelists or anybody in the audience and anybody up here, if they have a different solution, if they have some way, other than getting costs under control and maximizing short-term supply or some sort of regulatory effort, something that's going to get us through the next 2 years, I am very anxious to hear it.

But I think that is the stark realities that we're facing. And thank all of you for explaining—my time is up, so...

Mr. CALVERT. Thank you, gentlemen.

Even though I'll remind the panel that FERC is not under our jurisdiction, I'll ask the question, that—maybe to Dr. Karier.

What percentage of power does FERC have authority over the administrative--.

Mr. KARIER. I don't—.

Mr. CALVERT. An estimate of power, approximately.

Mr. KARIER. Well, that's something I probably have to research and give you the exact answer. But certainly FERC has jurisdiction over the investor owned utilities, and in the Northwest, we rely primarily on Bonneville as one large public entity, for about 40 percent of our power. BPA doesn't have the same oversight by FERC as the—.

Mr. CALVERT. I'm sorry to interrupt. But Bonneville is not charging 2- 3-, $400, $3,000 a megawatt hour? I mean, we don't need to regulate.

Mr. KARIER. Right. In many cases, Bonneville has said that they would follow any sort of direction from FERC—and so there's always a voluntary participation.

Mr. CALVERT. I just wondered, for the record, is it approximately about 50 percent of the market amount regulated—approximately?

Mr. KARIER. It's in that range.

Mr. CALVERT. Thank you.

Mr. DeFazio?

Mr. DEFAZIO. Thank you, Mr. Chairman.

Mr. Chairman, I've observed that the—the Pacific Northwest—as a result of the California deregulation and market manipulation by

a number of large energy companies and the failure of FERC to act—is paying higher average prices in the wholesale market than are California utilities.

Our problem is not in the Northwest. We don't need FERC to regulate the prices up here. We're not gouging anybody. We have a problem with the power we traditionally buy from California being at extortionate rates. And we are paying—and this is a fact which I can substantiate. We are paying higher average prices in the wholesale market than are California utilities when we purchase.

Mr. Klein, if you—if you would, the Chairman seemed critical of Bonneville's decision in investigating the role of the last administration in signing contracts with the aluminum companies. Mr. Wright said that at the time when he signed those contracts, that he believed—and under the market conditions at that time—that he could have provided the power to the aluminum companies without raising everybody else's rates.

Do you think that was an accurate assessment?

Well, he didn't sign the contracts, and he was an administrator. But he was at BPA at that time in entering into those contracts.

Mr. KLEIN. I have no reason to disbelieve his understanding of the circumstance.

Mr. DEFAZIO. So if wholesale rates today were the same as wholesale rates 2 years ago, we wouldn't be sitting here trying to figure out how to curtail the aluminum industry and looking at rate increases of 100, 200 percent for your customers?

Mr. KLEIN. I believe that's correct.

Mr. DEFAZIO. Thank you.

But on the other hand, I also—Mr. Wilcox, in the past, has been a great advocate of deregulation. In fact, I remember when he was going to take his company into the private market and do better than BPA. And he's advocating that—a pure rate, which he said is a dead horse. I'm glad to hear him admit it's a dead horse, because of the extraordinary negative effect that it would have on every other rate payer who isn't able to curtail 25 percent.

Could you comment a little bit on what the impact on your other customers, all your other businesses, small businesses, and residential rate payers would be of a tiered rate that was proposed.

Mr. KLEIN. Public power has great concern for that and hope that folks that look at this issue really look through to it, because, as we talked about, the DSI's lobby would receive substantially more than their statutory entitlement. They're a manufacturing operation that can, in fact, wrap up the production, depending upon the market conditions, and can, in fact—they've given 75 percent of their need at extremely below-market rate—however, can certainly continue to make profits as good or better than they've made in the past.

As you referenced, public utilities' customers of Bonneville, particularly those that have aggressively participated in conservation—what happens is the more you conserve, the more your load is down, the less you're entitled from Bonneville.

So if suddenly 75 percent of your customer base is provided adequately by Bonneville but you have this 25 percent exposure that never goes away, you can never get there from here. The more you

conserve to try to make up that 25, then the 75 percent price—that portion of your entitlement continues to shrink.

So the way this is proposed, a public utility would always have 75 percent of its customer base, whatever it is, served at one level and have the other 25—and unlike a business, you can't make 25 percent go away.

So basically it's a cost shift mechanism that shifts substantial costs to the citizens and consumers of the Northwest.

Mr. DEFAZIO. And how about as a conservation mechanism? He said it gets a 25 percent reduction in Great Britain. Well, of course, according toMr. Wright's figures, a 25 percent reduction in the current wholesale market rates being charged due to the market manipulations in California would lower us to a 210 percent rate increase if we provided it to everybody who has a contract. I assume that still wouldn't be an acceptable level of rate increase.

Mr. KLEIN. Right.

Mr. DEFAZIO. Just to further pursue this—because I'm bitterly opposed to tiered rates—in fact, I'm probably in Congress because of tiered rates, because my local utility put in place tiered rates during the WPPSS and was driving people out of their homes; and, I became a leader of a rate payer movement.

Just to examine it a little bit more, you're talking about for the utility. What about for an individual customer? What if you have an all-electric home and you've been given this 25 percent tiered rate; you've invested in insulation; you've got a heat pump; you've installed some fluorescent bulbs? Where do you get that 25 percent? What's the message the market is sending you here? What are you going to do?

Mr. KLEIN. That's a good question. And as—as I talked about, as those individuals—as the utility struggles to send the right signal to those consumers, the goal should be, is everybody conserves to the best degree they can. But ultimately, it doesn't help the utility in this kind of tiered rate arrangement. So you continue to mix and match price signals and confuse the consumer along with putting the utility in a position—.

So I guess in general, I agree with everything you've said.

Mr. DEFAZIO. Just one last question: Did we have any trouble getting conservation investments before Bonneville abandoned them in the mid '90's because of deregulation? The former administrator, who now works for Enron as a consultant, was, at the time, totally panicked, and he said he wasn't going to be able to sell his power at 2.3 cents a kilowatt hour, and he abandoned all conservation and renewable measures in the early, mid '90's.

But weren't we out there? Wasn't there an incredible amount available that we didn't buy?

Mr. KLEIN. Yeah. It's my understanding that the Northwest has been the most successful in the nation and has had the most aggressive conservation programs, which is amazing, because people say we have the lowest rates in the country and couldn't possibly have a conservation ethic. And we've put our conservation ethic up to any other area of the country.

Mr. DEFAZIO. So we don't need to screw people with higher rates in order to get them to conserve?

Mr. KLEIN. Right.

Mr. DEFAZIO. Thank you.

Mr. CALVERT. Mr. Larsen?

Mr. LARSEN. Thank you, Mr. Chairman.

Mr. Wilcox, the approach that—that Golden Northwest—I want to give a title to it—has distributed generation, and it's the idea that there are two chickens in every pot and two cars in every garage and two turbines in every backyard and basically building your own power supply. We're seeing that up in Bellingham and Georgia Pacific Paper Mill.

To address the issue that they're trying to address—that is, to keep the paper mill alive—they had to shut down the pulp mill. To keep the paper mill alive, they're looking at building two 10-megawatt generators on site.

Can you list—if there are obstacles—any regulatory or legislative obstacles that you're coming across or lessons that you're learning in going through this that—that we can possibly address?

Mr. WILCOX. I—actually, in terms of siding, I would say that the regulators of both Washington and Oregon have been very responsive. They understand that there's an energy crisis and are trying to move things expeditiously. So I have no complaints at all there.

I would say right now the one technical bottleneck is at the Bonneville transmission level, because Bonneville has a queue of who applies for transmission and kind of goes through them in order. And some of those may be small things that may never get done.

And I think one thing Bonneville could do is give out a different kind of sense of urgency to projects that are real and large and essential for a particular industry to stay in business—as an example, just kind of taking the one-megawatt emergency generator in the order in which it was filed.

Mr. LARSEN. The Boeing company—which we still like to remind folks still has 78,000 jobs here in the Northwest—related to Boeing—it's just the headquarters that's leaving—the Boeing company saw its electricity bill jump $1.6 million. And I know there's some discussion between Boeing and Snohomish County PUD's about doing something along the lines of what we're looking at.

So I want to just ask Dr. Karier, has the planning council looked at the policy implications, distributed generation, equity issues, access to power issues? Have you taken a look at that at all?

Mr. KARIER. What we are doing is trying to track all the new generation as closely as possible, including projects like Brett Wilcox's. There are a number of projects that have broken ground and are under construction, and we anticipate there will be about 1,800 new megawatts available by the end of this year in the Northwest. 200 of that is wind power. And there's another wave—probably equal to that amount—that will come on within the next year after that.

So the council originally identified that we needed about 3,000 new megawatts in the Northwest to reestablish a reasonable reserve level. And at least over the next two or 3 years, the projects that are under construction look like they will hit that target. That is assuming that all the projects are completed that are under construction or planned.

Mr. LARSEN. Are those all for the entire system or some of those projects for specific companies like Golden Northwest?

Mr. KARIER. These are projects in the Northwest, and it is all-inclusive. And if a project is designed for a specific industry, that may displace power from another utility.

So what we're looking at is the total supply-and-demand picture to make sure that we have enough reserves in the Northwest.

Mr. LARSEN. Mr. Chairman, I appreciate the opportunity to be up here today.

As you know, I'm not on the Resources Committee. I am on the Transportation and Infrastructure Committee. So there is an issue about high-financing the structure. If you don't mind, I would like to ask because in my district, there was a—in Bellingham, Washington—there was an explosion, a rupture, a pipeline explosion, that killed three young men. And the issue of pipeline safety is very important to the people I represent, but also recognizing that, that we do have to—there have to be some investments in the pipeline infrastructure to move natural gas to the areas where we need it to run the power plants.

Has—has the Northwest Power Planning Council looked at what percentage of this 38,000-or-so miles that the present energy report says we're going to need in terms of a new pipeline—has it looked at what kind of pipeline infrastructure we're going to need in the Northwest region to meet our needs?

Mr. KARIER. We are starting to look very closely at natural gas because so much of the new generation is going to be natural gas fired. And because prices have been volatile in natural gas, there is a lot of uncertainty there of how much—how much that power will cost.

Prices did rise significantly. They are about twice as high as they were two or 3 years ago. They've been very volatile. Our analysis of the gas industry is that there's a lot of effort being put into new supplies and to expansion of the pipeline. All of this seems to be on track to keep pace with—with the new demands, but it's an extraordinary new demand coming on with these plants.

So I think it's an area we need to keep monitoring and to look for potential bottlenecks. And there may be price spikes in the gas industry.

Mr. LARSEN. Are we going to do another round?

Mr. CALVERT. We're going to look at this chart rather than (inaudible) the last panel here pretty soon. But I have a couple questions I'd be happy to entertain (inaudible).

Dr. Karier, on the issue that Mr. Larsen just brought up on natural gas, would your primary source of natural gas be from Canada?

Mr. KARIER. That's right. For the Northwest, the primary sources are from Canada, from Alberta, and British Columbia.

Mr. CALVERT. Do you know the percentage of how much natural gas—in the Washington area, for instance, or the Pacific Northwest—comes from Canada rather than some other location?

Mr. KARIER. The other location is, I think, from the Rocky Mountain area from Colorado, and I don't know the exact percentage. I can find out. I think the majority of it is coming from Canada, though.

Mr. CALVERT. Is there any price differential at the present time between the gas that you're getting from Canada versus the—the Rocky region?

Mr. KARIER. I don't believe so, but again, I would have to check that.

Mr. CALVERT. The—the other issue on the amount of power that's coming on-line—you mentioned that you believe that—how many megawatts are coming on-line within the next year?

Mr. KARIER. 1,800 megawatts in the next year.

Mr. CALVERT. In the next 2 years?

Mr. KARIER. I believe it is an additional 1,700 megawatts in the second and third years.

Mr. CALVERT. And you believe that you'll be exceeding the 15 percent reserve capacity within two to 3 years? Do you believe that once you get to that, that—that there still will be market manipulation that can potentially have that type of activity going on, or do you believe that prices will start going down andstabilizing?

Mr. KARIER. In—well, in terms of the reliability that will provide, all these projects must be finished. The way that the council calculates it is we want a 5 percent or less chance of an outage due to inadequacy. Right now it's running at about a 20 percent possibility of inadequacy this coming winter, which is far too high.

So if all those projects are finished, we believe we'll be down in that range of a reasonable probability of an outage.

Certainly, I think the best pressure, to keep prices down in the long run, is to have an adequate supply available. And in this market, we can hope that all these projects will be finished, that adequate supply will be there, and prices will come down, and that will go a long way to producing stability for the market.

Mr. CALVERT. Thank you. Any additional questions?

Mr. DEFAZIO. Thank you, Mr. Chairman. Just to follow up on that line of questioning...

So in a deregulated market where utilities and generators no longer have a duty to run their system—let me just give you a statement that was made by the—I was in a debate with a fellow named Phil Romero, who is apparently a former staff member for Pete Wilson at the (inaudible) talking about his authorship of the California (inaudible) and a chair of the (inaudible) Electric Board last Monday night in Eugene.

And in response to a question—similar to what you just asked—about how much generation and supply is available in the Northwest now and how much of a shortage we have, Mr. Bergman, who is quite sophisticated in this matter, said, "I can't answer that question. No one can answer that question, because in the current market, nobody is telling anybody what they've got under contract and what they can generate because they're too vulnerable to the market and market manipulation.".

Was that a fair statement?

Mr. KARIER. Well, we found that it's difficult to get all the information that we require from the utilities. And certainly, I think that's a problem that needs to be looked into.

We—we do have a pretty good idea of the capacity that's existing out there in the Northwest and also--.

Mr. DEFAZIO. Right. But, if I could, in a deregulated market, nobody has to operate to their capacity; is that correct?

Mr. KARIER. That's true.

Mr. DEFAZIO. So if you're calculating that to get to this 5 percent margin, you just need a certain amount of installed capacity; and you are then assuming that those people will run those plants, the prices will be affordable, and the energy will be sold in the Northwest. Are those the assumptions you're making?

Mr. KARIER. I think the assumption is that there will also be an adequate number of producers that will be competing with each other. And if there is some sort of violation of—of competitive standards and rules, then certainly that could happen.

Mr. DEFAZIO. Well, what's happened in California is a few large energy companies dominate the market, and they can make more money sometimes by not running part of their supply and running the other part at extortionate prices.

What's to prevent that from happening here? What's going to overcome the market manipulation forces? There is this idea that, "Gee, maybe if we build enough, we'll get there.".

But if people can still merge and they can be dominated and people can exert market power, what is ever going to solve that problem and get us back to the reliability we had when it was a regulated, cost-based, affordable system?

Mr. KARIER. I certainly agree with some of the sentiments that you're expressing. In terms of the way the market has evolved, it's much more of a boom-bust type of market than I think anyone anticipated. And the fact that it took so long to get this new generation under construction, I think, is a significant problem.

Under a well-functioning market, you would hope that the producers would have anticipated that there was an impending shortage and they would have started this construction two or 3 years ago. That didn't happen. They started after the prices spiked. And so we have to wait two or 3 years until enough capacity comes online.

Mr. DEFAZIO. 28,000 megawatts is applied to BPA for transmission rights is what Mr. Wright says, at least preliminarily. If all that 28,000 got built, we would have a surplus of power potentially here in the Pacific Northwest.

So the other side of the market that we might see—which might be just this huge, quick downturn, to a point where it dropped to the prices of 2 years ago. Wouldn't that be below the imbedded cost of these new plants, let alone their marginal costs? Would they even operate the damn thing?

Mr. KARIER. Our experience so far has been underproduction. And we're experiencing a price spike associated with that.

Mr. DEFAZIO. Well, we had overproduction and now underproduction. I mean—you know, what we're talking about is extraordinary volatility here. Is volatility in price and in reliability a desirable characteristic for electricity? Is there a substitute that I'm not aware of?

Mr. KARIER. Well, prior to this, we had a regulated market, which basically forecasted energy needs and then regulated construction. And it was—it was obviously more stable—the prices

were not volatile. We did not have these kinds of shortages that we're experiencing now.

Mr. DEFAZIO. What's stopping us from going back to regulation?

Mr. KARIER. You may know the answer.

Mr. DEFAZIO. You just appointed us, Congress. Thank you.

Mr. CALVERT. Mr. Larsen--.

Mr. LARSEN. Mr. Chairman, thank you.

I have a few questions, one for Dr. Karier.

You talked about natural gas and the—the resources that need to be developed. The question I was trying to get at—that was, have you done—has the council done calculation on how many miles of pipelines we need to build in the Northwest, or is that someone else's job? Should I go to someone else to look at that?

Mr. KARIER. That's something that's tangential to what we're doing. We're simply monitoring what the gas industry is doing to see if there are potential bottlenecks that may arise. The industry at this point is trying to expand capacity within existing physical structures—and they seem to have some ability to do that before they start building expanded physical structures.

Mr. LARSEN. Thanks.

Mr. Klein, this is related to this issue of volatility. And in the market, we have—deregulation seemed to have been based on at least one premise that electricity was a commodity and had the characteristics of a commodity.

But can you, from your perspective, explain or provide some criteria about what you think a commodity is and how electricity is different from that and the impact that it's had on volatility in the market.

Mr. KLEIN. The first way, I'll answer that in a more humorous vein, and that is, it's an invisible commodity. So that makes it much different than some of the others.

But I—it's possible, I guess, that you could, if you spend enough time on it, maybe accomplish a restructuring that would allow it to be a commodity.

But I think the difficulty comes—is in order to—with electricity being such a necessity—I mean, you don't have to—like coffee beans or something like that, I suppose—but since it's such a necessity of life—.

Mr. LARSEN. In the Northwest, you're talking about?

Mr. KLEIN. That's true.

-- you really have to ensure there is a robust and vibrant market. You can't follow other typical commodity environments where you just believe the market will take care of itself and entities can enter and sell their apples today, or decide not to sell their apples today, on the market. People will just not buy apples if they're too costly.

In this case, where these are lighting and heating our schools and providing energy for needed surgeries and operations, this is an essential commodity. So if someone wants to turn it into a deregulated environment, you're going to have to do something unusual, and that puts some goalposts, puts some regulation around that market. And I guess no one's ever done that before, created a—a—a free market that—that is so constrained so you can assure

it remains robust. Then you're back to starting again. Then why are we doing this?

That's not to say that there aren't some things that we can do as a nation to promote so that we don't—we don't fall into that complacency and we don't look at new technologies in the energy industry, distributed generation, or things like this.

There are other ways, I think, that our legislative leadership can look to enhancing or providing incentives so that the electric industry doesn't see itself as a protected monopoly and doesn't look at new innovations. So I think there's a balance there.

Mr. DEFAZIO. If I could interrupt for just a second on the commodities aspect—I think it's useful to note that it is the only commodity that is traded on the Commodities Futures Exchange Commission—Trading Commission, which is not regulated by that commission. It is unique. It was exempted in the early '90's.

In fact, actually, one of the key votes was from the wife of a senator from Texas who serves on the board of Enron. It is now the only unregulated, deregulated commodity in the world, in the United States, that's traded.

Mr. LARSEN. Thank you, Mr. Chairman.

Mr. CALVERT. I thank this panel for your testimony and answering our questions.

And we will invite our third and final panel.

Ms. Sara Patton, the Coalition Director for the Northwest Energy Coalition; Mr. Ray—I believe it's Lepp—Vice President/General Manager, Birmingham Steel; Dr. James Anderson, Associate Professor of Fisheries Sciences at the University of Washington; and Mr. Rob Walton, the Assistant Manager, Public Power Council.

I thank the witnesses for attending today's hearing. We have some lights there. We attempt to try to keep the testimony to 5 minutes, where we'll have time for questions.

With that, Ms. Patton, you may begin your testimony.

STATEMENT OF SARA PATTON, COALITION DIRECTOR, NORTHWEST ENERGY COALITION

Ms. PATTON. Thank you.

Mr. Chairman, members of the Committee, my name is Sara Patton. I'm the Executive Director of the Northwest Energy Coalition.

The Coalition is in alliance with almost 100 organizations that advocate policies to provide clean and affordable energy for the residents of Washington, Oregon, Idaho, Montana, and British Columbia.

Our member organization includes consumer and environmental groups, community action agencies, progressive utilities, businesses, and others. A full list of our members is appended to my testimony.

Before I came to the Coalition, I worked for 15 years at Seattle City Light, designing and implementing the utility's award-winning conservation programs.

You've asked me to address the role conservation renewables can play in the current water and energy situation affecting the Pacific Northwest.

I will start with an assessment of the potential for cost-effective, clean, new renewable energy resources in the region and then move

to the demand side of the equation—on the contribution that energy efficiency and load management can make in the current situation.

On Clean, Renewable Energy: The excellent news about cost-effective, clean, renewable energy for the Northwest is perhaps best demonstrated in the excellent response to the Bonneville Power Administration's request for proposal for wind power. BPA asked for a thousand megawatts of wind power, at a competitive price, capable of commercial operation by late 2003.

In fact, BPA received a proposal for 2,532 megawatts of quick, clean, cost-effective wind projects in the region. BPA's press release on the subject, which begins with the exclamation, "The response blew us away," is appended to this testimony, along with a chart of the locations and sizes of projects.

And the good news about wind power's role in the current energy situation is not limited to potential for quick, new projects. There are over 90 megawatts of wind plants operating now in the region and over 400 megawatts of wind and geothermal energy under development to serve the region right now. A map and chart of these projects is also appended to my testimony.

Wind is estimated to cost between 3 and a half and 6 cents a kilowatt hour. The full potential of wind power in the region is enormous, at 133,000 average megawatts. And as BPA's experience bears out, the construction lead time is quite low, usually between one and 3 years.

The region also has a geothermal and solar potential—that I have detailed in my written testimony, but I won't talk about them right now, because I want to move to the Efficiency and Load Management. I want to make three points, one on the decline of energy efficiency investments that we've seen in the last 10 years; today's conservation opportunities; and, third, the load management opportunities. And I'll expand on each of these points in turn, but first I want to get a couple of important definitions.

The first definition is of "energy conservation." during this drought and financial crisis, we've asked people to turn down their thermostats, to turn off their lights, and to cut their hours of operation.

That's not energy conservation. That's curtailment or, more familiarly, shivering in the dark. The current situation demands this kind of sacrifice, and we thank the residences and businesses of our region for their very generous response.

The reduction in consumption is good for all of our pocketbooks but especially for low-income households and small businesses. And any water we can leave in the rivers is a blessing for the salmon struggling through this drought.

The energy conservation I will be talking about today, however, is not curtailment. It is not doing without but, rather, doing more with less. It's more efficient lighting, well-insulated homes, and high-efficiency motors in the industry.

This increased efficiency gives us comfortable homes, a competitive business, with the very least harm to our air, water, and climate.

The second definition—"load manage"—the term is used to cover a range of efforts to reduce consumption during peak periods. The

efforts include installing devices on residential water hatcheries to allow a utility to turn them off remotely when peak demand threatens blackouts or forces the utility to purchase outrageously priced power.

Similar opportunities are available in businesses and in industry. Typically the utility pays the customer for the willingness to reduce the consumption and agrees to a specified limit on the number and duration of those reductions.

These load amendment programs serve as a very cost-effective way to avoid the purchase of expensive power and/or blackouts in the short term without painful reduction in the quality of service.

Back to my three points after my definitions.

First, the Decline in Energy Efficiency Investments: In my written testimony, the Pacific Northwest largely abandoned the most successful and cost-effective energy conservation for the nation starting in 1994. We've achieved 1,500 megawatts—average megawatts, at a savings, at a cost 2 to 2 and a half cents a kilowatt hour, with a retail value of between 2- and $2.5 billion.

In Washington, investment has declined by 75 percent from 1993 to 1998. The BPA's investment dropped 80 percent between 1993 and 1999. There's lots of room for improvement. And the good news is that we have great opportunity today.

In its 1998 Conservation and Power Plan—that the Power Council projected over 1,500 average megawatts of cost-effective conservation at an average cost of 1.7 cents a kilowatt hour.

Given a much higher forecast of the cost of new generating between now—the council's staff confidently predicts that there are 2,400 average megawatts of energy conservation which are cheaper than new power.

The third point is we must take advantage of load management opportunities. In the very near term, utilities and the BPA can provide significant emergency insurance against blackouts and financially deduct the power purchases for load management.

Most high-rise, commercial buildings in this region already have energy measurements—computer sensors capable right now of shedding inessential (inaudible) loads on a moment's notice.

Less sophisticated devices are relatively easy to install and allow utilities to turn off water heaters, for example, instantaneously. Now is the time to get these options in the field. An entire year's class of salmon smolt are facing a massacre with the migration to the sea.

And we're risking human life with a high possibility of blackouts or condemning children with asthma and people with emphysema to the emergency rooms from all the new diesel generation we're firing up right now.

It's time to deliver clean and efficient—clean energy from efficiency and renewables and to take full advantage of load management opportunities.

My written testimony ends with a list of things Congress can do to help the region meet this precious, clean, and affordable energy.

Thanks, once again, for the opportunity.

Mr. CALVERT. Thank you.

[The prepared statement of Ms. Patton follows:]

Statement of Sara Patton, Executive Director, NW Energy Coalition

Introduction

Mr. Chairman, Members of the Committee, my name is Sara Patton. I am the Executive Director of the NW Energy Coalition. The Coalition is an alliance of almost 100 organizations advocating policies to provide clean and affordable energy for the residents of Washington, Oregon, Idaho, Montana and British Columbia. Our member organizations include consumer and environmental groups, community action agencies, progressive utilities, businesses and others. A full list of our members is appended to my testimony (Attachment A). Prior to coming to the Coalition, I worked for fifteen years at Seattle City Light, designing and implementing the utility's award-winning conservation programs.

We appreciate the opportunity to testify at this very timely hearing. Energy policy is on the public agenda today in a way that it has not been in many a year.

This hearing is focused particularly on the electric energy situation in the Pacific Northwest. While our region has its own particular situation, much of today's discussion can help inform our understanding of these issues at a national level as well.

The Committee is well aware of the Pacific Northwest region's supply situation and the implications for our region of recent developments in California energy markets. This situation makes it clear that inaction is not an option. You have asked me to address the role conservation and renewables can play in the current water and energy situation affecting the Pacific Northwest. The Northwest has a proud record of development of renewable energy and energy efficiency resources and the opportunity to build on that foundation is clear and compelling.

I will start with an assessment of the potential for cost-effective, clean, new renewable energy resources in the region and then move to the demand side of the equation - on the contribution that energy efficiency and load management can make in the current situation.

CLEAN RENEWABLE ENERGY

The excellent news about cost-effective clean renewable energy for the Northwest is perhaps best demonstrated in the excellent response to the Bonneville Power Administration's (BPA) Request for Proposals for wind power. BPA asked for 1000 megawatts (MW) of wind power at a competitive price and capable of commercial operation by late 2003. In fact, BPA received proposals for 2,532 MW of quick. clean. cost-effective wind projects in the region. BPA's press release on the subject, which begins with the exclamation, "The response blew us away . . ." is appended to this testimony along with a chart of the locations and sizes of the projects (Attachments B & C).

And the good news about wind power's role in the current energy situation is not limited to potential for quick new projects. There are over 90 MW of wind plants operating in the region and over 400 MW of wind and geothermal energy under development to serve the region right now. A map and chart of these projects are appended to this testimony (Attachment D). Wind is estimated to cost from 3.5 to 6 cents per kilowatt-hour (kWh). The full potential for wind power in the region is enormous at 133,000 average MW. I have been quoting MW rather than average MW above. Since wind is an intermittent resource, its average megawatts of production are usually about a third of its megawatts of capacity depending on the site. So 133,000 aMW is a very sizable potential. And as BPA's experience bears out, the construction lead-time is quite low, usually between 1–3 years.

The region also has significant geothermal power potential: between 7,000 and 11.000 MW at a cost of between 4.5 and 7 cents per kWh. The region has 45 aMW of geothermal under development and another 45 aMW in process.

Finally, we have sunshine in the region, if not on the I–5 corridor. There are more than 200,000 aMW of solar potential in the region from a combination of direct thermal and photovoltaic production. The costs for direct thermal vary from 2 to 13 cents per kWh and for photovoltaics from 17 to 21 cents per kWh. Even though photovoltaic power is still expensive to produce, it is frequently a cost-effective option for remote locations. which would require expensive line extensions in order to buy power from central station plants on the grid.

Fact sheets on wind, geothermal and solar power from the Renewable Northwest Project are appended to my testimony (Attachment E) and also available on RNP's web site at www.mp.org. The Renewable Northwest Project is an alliance of environmental and consumer groups with renewable energy developers, which promotes clean, renewable energy for the region.

ENERGY EFFICIENCY AND LOAD MANAGEMENT

I want to make three key points:

- While the Northwest has a record of innovation and leadership on energy efficiency, recent years have seen a distressing lapse of attention to conservation by BPA and too many Pacific Northwest utilities.
- There remain large opportunities to save energy, money and the environment through investments in energy efficiency in our region.
- While past conservation efforts have focused largely on reducing overall usage, today's situation also requires a focus on reducing peak demand.

I will expand on each of those points in turn but first a couple of important definitions. The use of the term "conservation" during the current crisis has caused my colleagues and me a great deal of distress. We have been used to using the terms "energy conservation" and "energy efficiency" synonymously. During this drought and financial crisis, many spokespeople and the media have called for homes and businesses to reduce their consumption by turning off lights, turning down (or up) thermostats and cutting hours of operation. They have called that behavior "conservation." We would call it curtailment or more familiarly, "shivering in the dark."

The current situation demands exactly this kind of sacrifice, and we support our elected officials and other leaders in calling for it. We thank the residents and businesses of the region for their generous response. The reduction in consumption is good for all of our pocketbooks, but especially for low-income households and small businesses, and any water we can leave in the rivers is a blessing for the salmon and other fish and wildlife struggling through this drought.

The energy conservation I will be talking about today, however, is NOT curtailment. It is not doing without, but rather doing more with less. It is more efficient lighting, wellinsulated homes, and high efficiency motors. This increaesd efficiency gives us.,. comfortable homes and competitive business and industry with the very least harm to our air, water and climate.

Second "load management" is a term used by utilities to cover a range of efforts to reduce consumption during peak demand. Usually the peaks have been measured for generation capacity, but the region is now also considering peak demand on transmission and even distribution capacity as well. The efforts include installing devices on residential water heaters to allow the utility to turn them off remotely when peak demand threatens a blackout or forces the utility. to purchase outrageously priced power. Similar opportunities are available in businesses and industry to reduce or curtail non-essential electrical consumption temporarily in response to system peaks. Typically the utility pays the customer for the willingness to reduce consumption and agrees to specified limits on number and duration of the reductions.

These load management programs do not necessarily result in less energy consumption overall and they are not strictly speaking improvements in efficiency. They can. however, serve as very cost-effective ways to avoid purchase of expensive peaking resources in the long term and purchase of expensive power and/or blackouts in the short term without a painful reduction in quality of service.

The Decline in Energy Efficiency Investments

According to the Northwest Power Planning Council, Pacific Northwest utilities acquired about 1327 average megawatts of cumulative conservation savings from 1978 to 2000. Federal, state and local efficiency codes and standards have saved more than 200 megawatts. For perspective, the grand total of 1,500 average megawatts is more than enough to serve the entire load of Seattle City Light. Utility funded conservation savings in those years were acquired at a cost between 2 and 2.5 cents per kilowatt-hour and had a retail value to consumers of $2.5 billion.

But starting in 1994, the region saw a steep decline in utility investments in energy efficiency. The most detailed study of this trend came in Washington State. The State's Department of Community Trade and Economic Development published a detailed survey of conservation investment trends in 1998 based on information from utilities serving 86% of the state's electric consumers.

That study found that total utility investments in conservation peaked in 1993 at $ 169 million (constant 1997 dollars) and then declined in each year thereafter. By 1998 utility conservation investments were down to only $42.5 million, a 75% reduction. No other state made a comparably detailed assessment, but there is little reason to doubt that the Washington experience was representative of the region as a whole. This is particularly likely given that the Bonneville Power Administration's financial support for public utility conservation programs was, between 1993 and 1999, cut by more than 80%.

Why did this happen? There are two major causes. First, estimates of the cost of new generation declined, driven by the advent of highly efficient combined-cycle

combustion turbines and projections of low future gas prices. In order to be cost-effective, of course. conservation investments must save energy at a cost lower than the price of new supply. When that "avoided cost" dropped, so did the supply of cost-effective efficiency investments, though the avoided costs used by almost all utilities included no accounting for environmental costs of various resources.

Some reduction in conservation effort was, thus, economically, if not environmentally. justified. But the scale of the conservation cutbacks far exceeded any reasonable estimate of the reduction in the pool of cost-effective savings. We need to search further for a complete explanation of these developments.

A second explanation for a reduction in utility conservation spending was the possibility of deregulation. The prospect of competition at the retail level created great uncertainties for utilities. Who would their customers be in the future? What would be the size of the load they would have to serve? Could the costs of conservation investments in the facilities of customers who defected to another supplier be recovered? In the absence of clear answers to these questions, utilities were reluctant to make new investments in either supply-side or demand-side resources.

Whatever the relative weight of these causes, the end result is clear. The Northwest experienced a drastic decline in investments in conservation, even in highly cost-effective conservation.

Today's Conservation Opportunities

With combined-cycle combustion turbines today's new generation resource-of-choice. recent dramatic increases in gas prices have significantly raised the avoided cost against which conservation investments must compete. The pool of cost-effective conservation opportunities has substantially expanded.

In its 1998 "Northwest Conservation and Electric Power Plan," the Northwest Power Planning Council evaluated the twenty-year supply of cost-effective conservation across a range of scenarios for future electricity demand, alternative resource costs, and water conditions. The Council concluded that, "The average amount of regionally costeffective conservation that the Council has identified is approximately 1,535 average megawatts." This number did not include any savings in the aluminum industry, although the Council believed that "there is undoubtedly some additional potential in that sector, as well." The average levelized cost of these 1,535 average megawatts of savings was approximately 1.7 cents per kilowatt-hour. Yes, this is an additional 1500 aMW on top of the 1500 aMW the region has already saved.

The 1998 Plan's mid-range forecast assumed that average real gas prices would escalate by about 1% per year. Obviously events have overtaken this forecast and, in so doing. have increased the amount of conservation that is cost-effective compared to new generation alternatives. The Council's new plan is not expected to be completed until late 2002, but Council staff has confidently predicted that the new long term gas, price forecasts will result in at least 2400 aMW of cost-effective energy efficiency potential in the region.

A study completed in June of this year by Council and Seattle City Light staff reinforces the message that there's a lot of highly cost-effective conservation out there. The study attempted to estimate the twenty-year conservation potential in Seattle's service territory.

With a 50 mill avoided cost threshold, the study found that 211 to 257 aMW of cost-effective conservation could be acquired over twenty years. The average cost of this conservation resource was estimated to be between 1.8 and 2.1 cents per kilowatt-hour. With this information, Seattle has decided to ramp up towards a doubling of its annual conservation targets. Over the next decade the utility plans to meet half of all load growth with conservation. And remember that this potential exists in a city that has. over twenty years, already implemented the most aggressive conservation effort in the region.

Cost-effective conservation remains a plentiful and highly affordable resource for the Northwest.

Load Management Opportunities

Historically Northwest conservation programs have focused on reducing the total number of kilowatt hours used, without much regard to when, in the year or the day, those savings occurred. In our hydro-dominated system this made sense. We were, in the jargon of the industry, "energyconstrained," not "peak-constrained." That is, the hydroelectric system has enormous peak capacity - Grand Coulee alone has a capacity of almost 10,000 megawatts - but the amount of water in the system limits the total number of kilowatt hours that can actually be generated over a year.

It is important to recognize that this situation has changed. Even our hydroelectric system is no longer big enough to buffer us against the high marginal costs

of peak energy usage. The unacceptably large probabilities of being unable to meet demand that the Northwest Power Planning Council has warned of are concentrated in the winter months (December–February) and on a limited number of peak hours in those months.

As the entire West Coast has seen this year, the costs of serving peak loads can be enormous. The cost of transmission capacity that is very rarely used can, all by itself, be larger than the ordinary cost of delivered power. If transmission capacity is priced at $24 per kilowatt year, then capacity that is used for only 400 hours per year costs 6 cents per kilowatt-hour actually delivered. The same economics apply to distribution capacity that is very rarely actually used. Finally, of course, system peaks - often driven by extreme cold-weather events in the Northwest -commonly strike many utilities at once. This coincident demand for energy can, and does, drive the cost of energy itself to remarkable heights. Add it all up and the value of reducing Pacific Northwest peak loads can be very substantial.

WHAT CONGRESS CAN DO

Let me close with a list of things Congress can do to assure that these renewable energy. conservation and load management opportunities do not escape our grasp and that the exciting potential of renewable resources does not remain mainly potential.

- Support tax credits for energy efficient new construction of buildings and homes.
- Support a ten year extension of the production tax credit for wind generating resources.
- Support stronger appliance efficiency standards and tax credits for early adopters.
- Provide matching funds for utility-run conservation programs, e.g., rebates for energy efficient appliances, weatherization and high efficiency industrial motors.
- Increase funding for low-income weatherization and energy assistance programs.
- Provide tax credits and other incentives for pollution control equipment to retrofit older generating plants.
- Establish a temporary federal price cap, i.e., Federal Energy Regulatory Commission implemented cost-plus pricing. Exempt new generation to get plants on line quickly.
- Provide financial support for BPA to invest in energy conservation and purchase more power, so it doesn't have to rely on harming salmon to ensure this October's Treasury payment.
- Support the use of energy efficiency and distributed renewable resources to relieve transmission congestion.

Thank you for the opportunity to present this testimony. The region does not have to overbuild fossil fuel power plants to meet the present crisis. We have plentiful, quick and cost-effective solutions from energy efficiency, wind and load management.

NW Energy Coalition

For a clean and affordable energy future

ATTACHMENT A

Member Organizations

A World Institute for a Sustainable Humanity — International
Alaska Housing Finance Corporation — AK
Alliance to Save Energy — National
Alternative Energy Resources Organization — MT
American Rivers — National
Association For The Advancement of Sustainable Energy Policy — BC
Central Area Motivation Program — WA
Citizens Utility Board — OR
Clallam-Jefferson Community Action Council — WA
Climate Solutions — WA
Cold Spring Conservancy — WA
Community Action Directors of Oregon — OR
Earth and Spirit Council — OR
Emerald People's Utility District — OR
Eugene Future Power Committee — OR
Eugene Water and Electric Board — OR
Fair Use of Snohomish Energy — WA
Friends of the Earth — National
Golden Eagle Audubon Society — ID
Greenpeace — International
Housing & Community Service Agency of Lane County — OR
Human Resources Council, District XI — MT
Idaho Community Action Association — ID
Idaho Community Action Network — ID
Idaho Conservation League — ID
Idaho Consumer Affairs — ID
Idaho Rivers United — ID
Idaho Rural Council — ID
Idaho Wildlife Federation — ID
Kootenay-Okanagan Electric Consumers Association — BC
Land and Water Fund of the Rockies — Regional
League of Utilities and Social Service Agencies — OR
League of Women Voters — ID, OR, WA
Metrocenter YMCA — WA
Missoula Urban Demonstration Project — MT
Montana Environmental Information Center — MT
Montana Public Interest Research Group — MT
Montana River Action — MT
Montana Trout Unlimited — MT
Mountaineers — WA
National Center For Appropriate Technology — MT
Natural Resources Defense Council — National
Northern Plains Resource Council — MT
National Energy Efficiency Alliance — Regional
Northwest Energy Efficiency Council — WA
Northwest Resource Information Center — ID
Northwest Sustainable Energy for Economic Development (SEED) — Regional
Olympic Community Action Program — WA
Opportunity Council — WA
Oregon Action — OR
Oregon Energy Coordinators Association — OR
Oregon Energy Partnership — OR
Oregon Environmental Council — OR
Oregon State Public Interest Research Group — OR
Pacific Northwest Council of Carpenters — Regional
Pacific Rivers Council — OR
Portland Energy Conservation, Inc. — OR
Portland General Electric — OR
Puget Sound Council of Senior Citizens — WA
Renewable Northwest Project — Regional
Rivers Council of Washington — WA
Salmon For All — OR
Save Our *Wild* Salmon Coalition — Regional
Seattle Audubon Society — WA
Seattle City Light — WA
Sierra Club — Regional
Sierra Club of British Columbia — BC
Snohomish County Public Utility District — WA
Solar Energy Association of Oregon — OR
Solar Information Center — OR
Solar Washington — WA
South Central Community Action — ID
South East Idaho Community Action Agency — ID
Southern Alliance for Clean Energy — Regional
Spokane Neighborhood Action Programs — WA
Tahoma Audubon Society — WA
Trout Unlimited — WA
Union of Concerned Scientists — National
Washington Citizen Action — WA
Washington Environmental Council — WA
Washington Public Interest Research Group — WA
Washington State Association of Community Action Agencies — WA
Washington State University Energy Program — WA
Washington Wilderness Coalition — WA
Western SUN Cooperative — Regional
Working for Equality and Economic Liberation — MT
Yakima Valley Opportunities Industrialization Center — WA

Associate Members
City of Ashland — OR
Puget Sound Energy — WA

Supporting Members
Clackamas County Weatherization — OR
Department of Community, Trade and Economic Development — WA
Housing Authority of Skagit County — WA
Multnomah County Weatherization — OR
Rocky Mountain Institute — National

219 First Avenue South, Suite 100 • Seattle, WA 98104
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www.nwenergy.org

Attachment B

bpanews

PR 25 01

FOR IMMEDIATE RELEASE:
THURSDAY, April 26, 2001
CONTACT: George Darr, (503) 230-4386

Astonishing number of wind generation proposals blows into BPA

PORTLAND, Ore. – "The response blew us away," said George Darr, Bonneville Power Administration's renewable power resource program manager. Darr spent last weekend counting up the wind generation projects submitted in response to the agency's request for proposals.

"I thought developers would be far enough along with their projects to submit maybe 1,000 megawatts of projects, but the 25 proposals added up to about 2,600 megawatts," said Darr. "Further, if you count the room for expansion included in the proposals, there are over 4,000 megawatts of wind power on these sites. That is astonishing."

Most of the proposed sites are in Oregon (10) and Washington (8). The rest are distributed among Idaho, Montana, Wyoming and even Canada.

Rep. Norm Dicks (D-Wash.) was also impressed with the response. "I have been convinced that the Pacific Northwest offers the potential for significant wind power generation that could be an effective complement to our hydroelectric system. It is extremely encouraging to see such a large number of creative proposals submitted, and it is my hope that BPA will evaluate them promptly and take advantage of the relatively fast siting capability offered by wind generated power," said Dicks.

BPA will evaluate the projects in terms of cost, how well they can be integrated into the Northwest power grid and other factors. Location is an important consideration both for how well the projects can be used to serve loads and for the impact they have because of the intermittent nature of wind output. It is very helpful if they are near other generation.

-more-

Bonneville Power Administration 905 N.E. 11th Avenue, Portland, Oregon 97232
Mailing Address: Media Relations - KC7, P.O. Box 3621, Portland, OR 97208-3621
Phone: (503) 230-5131 **Fax:** (503) 230-5884 **Web site:** http://www.bpa.gov

BPA will select the most promising proposals by the end of May and then begin contract negotiations with developers. Once BPA and the developers have reached agreement on contract terms, BPA will conduct National Environmental Policy Act review of the environmental impact of the proposed projects. Darr hopes the first of the projects can be online in late 2002 or early 2003.

Rep. Greg Walden (R-Ore.), co-chair of the House Renewable Energy Caucus and the sole Northwest member of the Energy and Commerce Committee, was encouraged by the response from rural communities. "We need more energy generation in the Northwest to help us bring down costs. This is one of the best kinds of energy to bring on line — it's clean and renewable. And the growth of clean energy production in the rural Northwest will bring vital new revenues and jobs to parts of the region that need an economic boost."

Peter West, green program director at the Renewable Northwest Project in Portland, Ore., was encouraged by the response. "The results show the strength and diversity of the wind resource in the Northwest. With the leadership of BPA, the Northwest is poised to be one of the hottest wind sites in the world. This shows how renewable resources will help solve our energy crisis."

Because wind speed varies, the 2,600 megawatt capacity of the proposals will likely translate into about 850 average megawatts of power. That is more than enough power to meet the needs of the city of Portland.

###

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Phone: (503) 230-5131 **Fax:** (503) 230-5884 **Web site:** http://www.bpa.gov

Geographic Distribution of Proposed Wind Projects

State or Province	No. of Projects	MW	aMW
Idaho	1	70	21
Montana	3	238	93
Oregon	10	1123	319
Washington	7	799	275
Wyoming	4	208	87
Alberta	1	94	25

Pacific Northwest Renewable Energy Projects

11/30/00

Resource	Project	State	Capacity (MW)	Output (aMW)	Participants	Developer	EIS Status	General Status
Wind	Foote Creek Rim I	WY	41.4	14.5	PacifiCorp (19.6), EWEB (6.5), BPA (15.3)	SeaWest	Completed	Operating
	Foote Creek Rim II		1.8	0.8	BPA (1.8)			Operating
	Foote Creek Rim III		25	10.6	Public Service of Colorado			Operating
	Foote Creek Rim IV		16.8	7.4	BPA			On line date 8/31/00
	Columbia Wind Farm 1	WA	25	7	BPA, Conservation and Renewable Energy Systems		Re-review pending	on hold
	Columbia Hills Windplant	WA	31	9.3	On Hold	Enron Wind holds leases	Completed for old Kenetech project	Permit issued for old Kenetech project
	Condon	OR	24.6	7.4 (est.)	BPA	SeaWest	Underway	Initiating permitting & resource assessment
	Stateline	OR, WA	300	100 (est.)	Negotiations Ongoing	FPL Energy	Completed	WA construction underway OR permitting underway
	Vansycle Windplant	OR	24.5	7.5	PGE	FPL Energy	NA	Operating
	Blackfeet I Wind Project	MT	22-50	8.8 (est.)	Montana Power, BPA	SeaWest	Underway	Beginning permit & review process
	9 Canyon Wind Project (near Kennewick)	WA	15+		Energy Northwest	Energy NW		beginning initial analysis
Geothermal	Medicine Lake Glass Mountain Area (Near Klamath Falls, OR)	N. CA	49	45	BPA	Cal Energy	Complete	Rejected by Forest Service Appeal Pending
	Four Mile Hill Glass Mountain Area (Near Klamath Falls, OR)	N. CA	49	45	BPA	Calpine	Complete	Forest Service, BPA ROD BPA Contract
Solar	Various Projects*	OR, MT WA			City of Ashland Orcas Power & Light Montana Power	N/A	N/A	programs and installations for residential, schools, commercial and agricultural

Notes: *This is not intended to be a complete list; there are many more solar installations in the NW

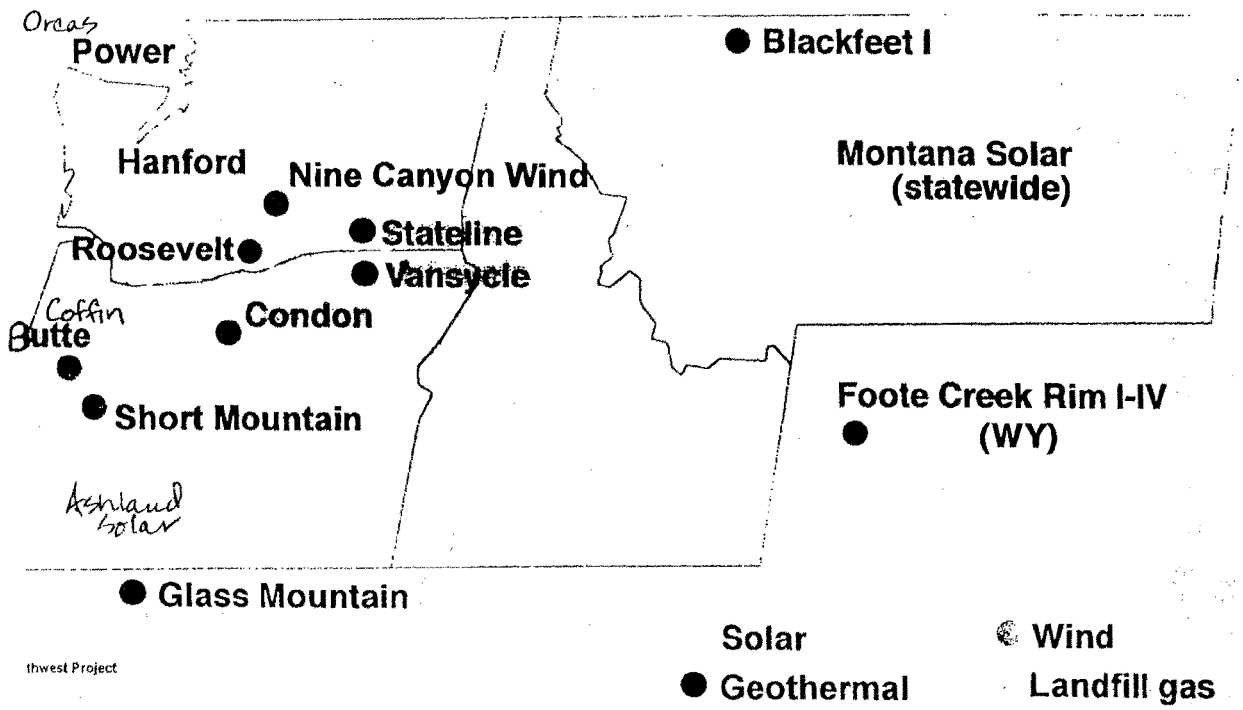
The Conservation and Renewable Energy Systems represents Benton, Clallam, Franklin, Grays Harbor, Klickitat, Pacific and Skamania County PUDs.

Salem Electric will purchase power from some of these renewable energy projects through BPA

Renewable Northwest Project

Attachment D

New Renewable Energy Projects in the Northwest



thwest Project

Wind power

Wyoming wind photo by Jim Maloney

Montana alone has enough wind resources to supply 15 percent of the electricity needs of the United States.

Potential • Cost • Economic benefits • How it works • System integration • Environmental impacts • Incentive programs • Wind Links

Potential

The Pacific Northwest has the potential to generate 133,000 average megawatts or more of electricity from wind power. The majority of the region's wind resources are in Montana, but some of the best sites are also in Idaho, Oregon and Washington. Montana alone has enough winds resources to supply 15 percent of U.S. electricity demand; Oregon and Idaho could meet all of their power needs with wind, and Washington could use wind power for about 3 million homes.

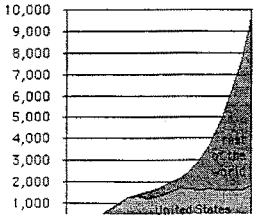
Read all about two new wind projects in the West. We have the scoop on Vansycle Ridge wind project in Oregon, and the Wyoming Wind Project at Foote Creek Rim.

LOCATION OF WIND RESOURCES

wind quality good excellent

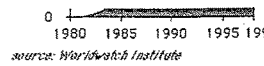
Just over 68 MW of nameplate capacity has been developed for the Northwest. California leads the United States in wind development despite its modest wind resources, with over 1,650 MW of installed capacity. Texas and Minnesota also are making rapid investments in wind power. Texas has developed 188 MW of capacity in the last four years and a new "renewable portfolio standard" will add another 1300 MW or more in the near future. Wind investment in Minnesota is driven by a law that required the state's largest utility to develop 425-825 MW of wind power in exchange for the right to store additional waste on the site of one of its nuclear plants. Subsequent studies found that additional wind farms were the least expensive option for expanding the state's power supply.

WING GENERATING CAPACITY
(installed, megawatts)



The United States is currently being left behind in wind development by Europe, which expects to have at least 17,000 MW installed by 2005 and is shooting for 40,000 MW by 2010.

Technological improvements, lower costs, uncertain fossil fuel prices, the desire for



system diversity, and environmental concerns continue to drive investments in wind energy.

Cost
Advances in technology and experience have made wind competitive with many fossil fuel power sources. The cost of energy from wind projects fell by 80 percent between the early 1980s and late 1990s; real levelized costs are now about 4-6 cents per kilowatt-hour without any tax credits, competitive with many new coal or natural gas facilities. Costs for individual projects depend on financing, transmission infrastructure, and wind quality. The most cost-effective wind farms usually have at least 35 turbines and a total capacity of 25 MW or more.

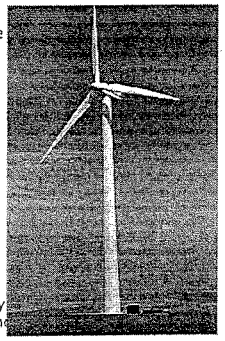
Potential wind energy in the Northwest

Oregon	4,900 aMW
Washington	3,700 aMW
Idaho	8,300 aMW
Montana	116,000 aMW
Resource type	intermittent, predictable
Capacity factor	20-44%
Real levelized cost	(1999$) 4-6 ¢/kWh
Construction lead time	1-3 years

sources: see endnotes

Economic Benefits
Wind generation is very competitive with other sources of electricity, especially when factoring in social and environmental costs and the risk of future fuel price increases. But wind projects provide added benefits by keeping more money in local economies, integrating with existing land uses, and providing extra income to property owners in the form of power sales or royalty payments. The Wisconsin Energy Bureau estimates that wind projects create three times as many jobs as the same level of spending on fossil fuels. Portland General Electric estimates that a 240 MW natural gas plant drains $28-55 million out of the regional economy annually for fuel imports.

How it Works
Turbine blades, modeled after airplane wings, rotate due to a pressure differential caused by air moving over the surface of the blade. The blades cause a rotor to turn, which drives an electrical generator. The turbines are oriented automatically by the wind or by computer-controlled drive systems so that they always face toward the wind.



Wind turbines can be designed to operate either at variable speeds or at a single, fixed speed. The variable speed designs are more complex but they convert wind power into electricity advances have made them the best ch projects.

Most wind turbines are designed to use wind blowing at 9-65 mph. Sizes for new U.S. turbines range from 500 to 750 kW and European turbines range from 600 to 1,650 kW.

System Integration
Wind farms have predictable, reliable output with seasonal and daily variations which can be matched to utility load requirements. Wind resources can also be balanced using a power system's existing load-matching capabilities, or multiple wind sites can be combined to create a flat, stable power supply curve. Because the best wind resources in the Northwest are located in rural areas, access to the transmission grid is a critical component in selecting a site.

Environmental Impacts
Wind power generates no emissions, in contrast to fossil fuel plants which create particulates, greenhouse gases, and acid rain precursors. Although wind is one of the most benign power sources, if not properly sited, it too may have environmental impacts. Wildlife and avian impacts can be the greatest concern, but new tower, blade and turbine technologies and careful siting minimize environmental impacts.

Incentive Programs
Programs are available through each of the region's states. Oregon provides personal and business tax credits for renewable energy projects as well as some long-term, low-cost financing and technical advice. Washington provides a sales tax exemption for turbines used in large wind projects. Montana grants a property tax exemption for business or residential applications and a tax credit for capital equipment costs associated with wind energy development. In Idaho, up to $20,000 of a system's construction costs can be deducted from income taxes over 4 years, and low-interest loans are available for some renewable energy development.

Wind Links
Read all about two new wind projects in the West. We have the scoop on Vansycle Ridge wind project in Oregon, and the Wyoming Wind Project at Foote Creek Rim.

See AWEA's map of wind projects in the US:
www.awea.org/projects/index.html

Bottom photo: Vansycle Ridge wind turbine.

Sources:
1. Power capacities for intermittent resources such as wind can be expressed in two forms: (1) "nameplate" or "peak" megawatts (MWp) refer to the amount of power delivered when the wind is blowing at the project's rated speed; (2) "average" megawatts (aMW) indicate the average amount of power delivered over the course of the year, averaging together times of high and low wind. The "capacity factor" indicates the ratio between the average output and the nameplate output.
2. Wind capacity factor from from Fourth Northwest Conservation and Electric Power Plan, Northwest Power Planning Council (NWPPC), 1998. Cost of energy from "Comparative Cost of Wind and Other Fuels," American Wind Energy Association (AWEA) fact sheet, accessed online 6/15/99
3. Northwestern wind resources from Investing in the Future: A Regulator's Guide to Renewables, National Association of Regulatory Utility Commissioners, 1993. America Takes Stock of a Vast Energy Resource, published by EPRI through USDOE and the National Renewable Energy Lab. Minnesota development from Minnesotans for an Energy Efficient Economy, 7/99and from the Izaak Walton League of America's "Testimony in Support of Increased Wind Energy Development in Minnesota", 1998, available online at http://www.me3
.org/issues/wind/iwianspirp.html. Texas development and plans from Tom Smith, Public Citizen, 7/99 European wind energy from Wind Energy -the Facts;

Volume 5: Market Development, European Commission Directorate-General for Energy, 1997.
4. Fossil fuel and wind costs and price trend from AWEA op cit. note 2. Wind farm sizes from conversation with Tom Gray, AWEA, June 1999.
5. Wind resource information from An Assessment of the Available Windy Land Area and Wind Energy Potential in the United States, Pacific Northwest Laboratories. "Good" resource areas have Class 4 winds, which average 14.6-15.7 mph at 30 meters altitude. "Excellent" areas are Class 5 and above, with average wind speeds above 15.7 mph.
6. General economic impacts from Dollars from Sense: The Economic Benefits of Renewable Energy, National Renewable Energy Laboratory, 1997. Job impacts from The Economic Impacts of Wind Energy Use in Wisconsin, Wisconsin Department of Administration, Energy Bureau, 1995, and Wind Energy Program Overview, U.S. DOE, 1993. Cost of fuel imports from Report of the Geothermal Subgroup to PGE Management, pg. A-2, Portland General Electric, 1993.
7. Operational wind speeds from NWPPC, op. cit. note 2. Wind turbine sizes from Tom Gray, op. cit. note 4.
8. NWPPC, op cit. note 2, pp. FWN-8-FWN-9; Wind Subgroup Report to PGE Management, pp. 14-15, Portland General Electric, 1993.

Geothermal power

Experts believe the Northwest has enough potential geothermal power to serve more than 1.3 million homes.

What Is Geothermal Power?
Geothermal energy is heat from deep in the earth. The heat is brought near the surface by underground circulation of water and by the intrusion into the earth's crust of molten magma. The portion of geothermal energy that can easily be developed is trapped in saturated, fractured hot rocks near enough to the earth's surface to be reached by drilling. Wells, sometimes over two miles deep, bring the steam or hot water to the surface, where the steam is used to to run an electrical generator in a geothermal power plant. The hot water is returned to the periphery of the geothermal reservoir. In most cases of high temperature (above 250 F), geothermal resources are not pumped out of the ground because they will flow under natural pressure at these temperatures.

Potential
The Pacific Northwest has the potential to generate up to 11,000 megawatts of electricity from geothermal power. Although estimates of available resources are uncertain until exploratory work is done, the Northwest Power Planning Council has identified eleven specific areas where it expects there are about 2,000 MW developable – that's enough power to serve over 1.3 million homes.

LOCATION OF GEOTHERMAL RESOURCES

thermal activity moderate high

Geothermal areas in the western United States are usually found where there has been relatively recent volcanic activity. The most promising sites in the Northwest are in the basin and range country of southeastern Oregon, and along the Cascades in Oregon, Washington and northern California. Virtually all of the geothermal electric generation developed in the U.S. so far has been in California, Nevada and Utah. Low-temperature geothermal district heating has been used for decades in Klamath Falls, Oregon, and Boise, Idaho, and the Big Island of Hawaii generates 25% of its power from geothermal.

Cost
Real levelized costs for geothermal electricity generation are 4.5-7 cents per kilowatt-hour – competitive with some fossil fuel facilities, but without the pollution. Delivered costs depend on ownership arrangements, financing, transmission, the quality of the resource, and the size of the project. Geothermal plants are built of modular parts, with most projects including one or more 25-50 MW turbines.

Geothermal plants are relatively capital-intensive, with low variable costs and no fuel costs. Usually financing is structured so that the project pays back its capital costs in the first 15

years, delivering power at 5-10¢/kWh. Costs then fall by 50-70 percent, to cover just operations and maintenance for the remaining 15-30 years that the facility operates.

Economic Benefits
Geothermal power, like all renewable resources, keeps economic benefits local. The most promising geothermal project sites are in rural areas. Geothermal power provides local jobs, retains dollars locally, pays local property taxes, and contributes royalties to the local county to support services. A study by the Oregon Department of Energy found that a 100 MW project in Eastern Oregon could create over a million dollars of additional local income each year, and would pay $4-6 million in local and state fees, royalties and taxes. In contrast, a similarly sized natural gas project sends $11-24 million out of the region every year for fuel costs alone.

Geothermal energy resources in the Northwest

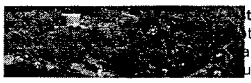
Total potential supply	7,100-11,000 MW
Resource type baseload	Capacity factor: 90%
Construction lead time	1-3 years
Real levelized cost (1999$)	4.5-7 ¢/kWh
Operating life	30-50 years
U.S. geothermal developed	2,850 MW
NW proposed	120 MW

sources: see endnote

How It Works
There are several types of geothermal resources. Most of the installed geothermal electrical generating plants use either flash or binary technologies. Generally, flash technologies are used when the geothermal resource has temperatures of 350°F and higher, and binary technologies are used at temperatures below 350°F. In both technologies, the geothermal fluids are returned to the underground reservoirs and naturally reheated for reuse.

In a flash steam process, water from underground wells is separated (flashed) into steam and water. The water is directly returned to the geothermal reservoir by injection wells, or cycled for other process or agricultural uses before re-injection. The steam is used to drive a turbine and generate electricity. Any gases in the steam are removed and, if necessary, treated to remove dissolved pollutants. The steam is cooled to liquid form and then also re-injected into the geothermal reservoir. For very high temperature resources, the water can be controlled to flash more than once to recover even more energy from the same resource.

A binary power plant is used for moderate-temperature resources. The hot water from a geothermal source is used to heat a secondary working fluid, such as ammonia or isobutane, in a closed-loop system. The working fluid is vaporized in a heat exchanger and is then used to drive a turbine-generator. A cooling system is used to condense the vaporized working fluid back into liquid form to begin the process again. The hot water from the geothermal resource is injected back into the reservoir. The hot water and the working fluid are kept separate, so that environmental issues are minimal.



tem Integration
thermal plants are the most able of all electricity sources, larly operating at 90 percent

nore of their rated capacity r-round. Because they can run tinuously, geothermal plants most often used for providing me plants in Italy and at The Geysers in California have been used to help meet daily peak loads. Geothermal power can provide significant system diversity, stability and transmission benefits, thereby increasing system reliability and lowering overall operating costs.

Environmental Impacts

Although geothermal is one of the more benign power sources, it must be properly sited to prevent possible environmental impacts. New geothermal systems re-inject water into the earth after its heat is used, in order to preserve the resource and to contain gases and heavy metals sometimes found in geothermal fluids. Care must be taken in planning geothermal projects to ensure that they don't cool nearby hot springs or cause intermixing with ground water. Geothermal projects can produce some carbon dioxide emissions, but these are 15-20 times lower than the cleanest fossil-fuel power plants of the same size.

Sources

1. Resource potential from Fourth Northwest Conservation and Electric Power Plan, Northwest Power Planning Council (NWPPC), 1998, pp. FGT-5-FGT-7. The real levelized cost of energy is the long-term average cost of energy without the effect of inflation. The levelized cost of energy shown here is based on conversations with Jeff King, NWPPC, 7/99 Jack Pigott, Calpine Corporation, 7/99 and David McClain, Geothermal Resource Council, 7/99 Total U.S. geothermal development from "International Geothermal Association: Geothermal Power Plants On-Line in 1998," available at www.demon.co/uk/geosci/wrtab.html. Northwest development from NWPPC, p. FGT-13.
2. NWPPC, op. cit. note 1; Investing in the Future: A Regulator's Guide to Renewables, National Association of Regulatory Utility Commissioners (NARUC), 1993, p. D-5; Report of the Geothermal Subgroup to PGE Management, Portland General Electric, 1993.
3. See note 1 for levelized cost sources. Project financing from Jack Pigott op cit. note 1. O&M costs from NWPPC, op cit. note 1. Other information from NARUC, op. cit. note 2, pp. B.9-B.12 and Dave McClain op cit. note 1.
4. Map information from U.S. Geological Survey, reproduced in NARUC op. cit. note 2, page A-3. "Moderate" thermal activity indicates areas where hot springs have temperatures below 194° F, suitable for direct heating applications. "High" thermal activity indicates areas with springs hotter than 194° F, potentially suitable for electricity generation.
5. PGE, op. cit. note 2, app. A; Economic Impacts of Geothermal Development in Deschutes County, Oregon, Oregon Dept. of Energy, 1991, cited by PGE.
6. This section and diagram based on NWPPC, op. cit. note 1, and NARUC, op. cit. note 2.
7. Renewable Energy Technology Characterizations, EPRI/DOE, 1997, ch. 3.
8. NWPPC, op. cit. note 1.

Graphic by Matthias Fripp, 1999

Solar Power

"The Northwest receives more than enough sunlight to meet its entire annual power needs."

The Basics • Resource Potential • Photovoltaic Cells • Direct Thermal • Environmental Impacts • Net Metering • Incentive Programs

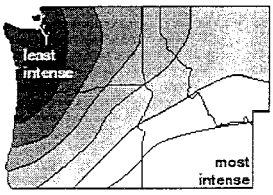
The Basics

Solar energy technologies convert the sun's light into usable electricity or heat. Solar energy systems can be divided into two major categories: electric and thermal. Photovoltaic cells produce electricity directly, while solar thermal systems produce heat for buildings, industrial processes or domestic hot water. Thermal systems can also produce electricity by operating heat engines or by boiling steam to spin electric turbines. Solar energy systems have no fuel costs, and low operating and maintenance costs. The total costs of solar applications vary depending on the type of financing used to invest in the equipment, and the relative availability of solar radiation.

Resource Potential

In the Northwest, solar energy offers more potential than any other renewable resource; in fact, the region receives more than enough sunlight to meet its entire annual power needs. As the map to the right illustrates, the Northwest's highest potential is in southeastern Oregon and southern Idaho; however, there are no "bad" solar sites – even the cloudiest parts of the Northwest receive almost half as much solar energy as the deserts of California and Arizona – and they receive more than Germany, which has made itself a solar energy leader.

DISTRIBUTION OF SUNLIGHT



total solar energy striking a tilted, south-facing surface (kWh/m²/day)

2.5	3.1	3.6	4.2	4.7	5.3	5.8

source: NWPPC Power Plan

Solar energy resources in the Northwest:

Total potential supply	> 200,000 average MW
Resource type	intermittent, predictable
Capacity factor	16-30%
Construction lead time	0-2 years
Real levelized cost (1998$)	direct thermal 2-13 ¢/kWh rooftop photovoltaics 17-21 ¢/kWh sources: see endnote

Photovoltaic Cells

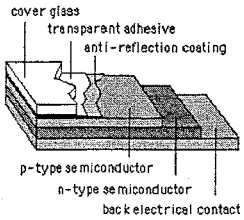
Photovoltaics (PVs) convert sunlight directly into electricity, using semi-conductors made from silicon or other materials. Photovoltaic modules mounted on homes in the Northwest can produce electricity at a real levelized cost of 17 to 21 cents per kilowatt-hour (kWh).

Find out how students in Montana are using solar energy.

PVs generate power on a much smaller scale than traditional utility power plants, so they can often provide high-value electricity exactly where and when it is needed. PVs are often the best choice for supplying power for remote, "off-grid" sites or in situations where the transmission or distribution system

would otherwise need to be upgraded in order to meet peak demands. Distribution line extensions of more than half a mile are generally more expensive than investing in a PV system for a typical home.

ANATOMY OF A SOLAR CELL



Other cost-effective PV applications include building-integrated power generation, meeting high summer demand for electricity (e.g., air conditioning), pumping water, lighting signs and powering equipment used for communications, safety or signaling.

Prices for photovoltaics are falling as markets expand. Between 1975 and 1998, sales volume for PV modules grew by an average of 21 percent per year, while real prices fell from $80 to less than $4 per watt of capacity.

Direct Thermal
Direct-use thermal systems usually are located on individual buildings, where they use solar energy directly as a source of heat. The most common systems use sunlight to heat water for houses or swimming pools, or use collector systems or passive solar architecture to heat living and working spaces. These systems can replace electric heating for as little as 2 cents per kilowatt-hour, and utility and state incentives reduce the costs even further in some cases.

Environmental Impacts
Solar power is an extremely clean way to generate electricity. There are no air emissions associated with the operation of solar modules or direct application technologies. Residential-scale passive construction, photovoltaic, solar water heating, and other direct applications reduce land use impacts from typical utility generation, transmission and distribution.

Net Metering
Utilities in all four Northwestern states offer net metering programs, which make it easy for customers to install solar electric systems at their homes or businesses. In a net metering program, customers feed excess power generated by their solar equipment during the day into the utility's electrical grid for distribution to other customers. Then, at night or other times when the customer needs more power than their system generates, the building draws power back from the utility grid.

Net metering allows customers to install solar equipment without the need for expensive storage systems, and without wasting extra power generated when sunlight is at its peak. Such programs also provide a simple, standardized way for customers to use solar systems while retaining access to utility-supplied power.

Most net metering programs keep track of power generation and consumption using only the electric meter already connected to the customer's building; the meter literally runs backward when power is being fed from the solar system into the grid, and then runs forward again when power is drawn

from the utility grid. The customer is billed only for the net amount of electricity that is drawn from the utility. Some utilities may even go further, such as Orcas Power and Light in North Puget Sound, Washington, which offers customers a half cent above the retail price for power they generate from solar.

Net metering works well with the latest generation of PV systems, which have sophisticated electronic power controls. Modern PV systems provide electricity exactly matched to the utility's voltage and frequency, and they shut off automatically when the utility power supply fails, so they pose no risk to electric line repair crews.

Under new laws, net metering is available from utilities throughout Oregon and Washington, and utilities in most of Montana offer it as well. Idaho Power and Washington Water Power offer net metering in Idaho in accord with a Public Utilities Commission rule.

Incentive Programs in the Northwest
Every state in the Northwest offers incentives for solar energy development. Oregon and Idaho offer low-interest loans and substantial tax credits for solar systems bought by businesses, individuals or governments. Oregon and Washington offer technical assistance for setting up solar systems, and Montana and Oregon exempt non-commercial solar systems from property tax assessment. Many local utilities also provide incentives. For example, some Oregon utilities offer technical assistance, no-interest loans and cash discounts for solar water heating systems; the Washington State University Energy Extension offers a 25 percent rebate for off-grid solar systems; the City of Olympia offers one for on-grid systems; and the Okanagan electric co-op sells solar systems to customers at cost.

Sources:
1. Power supply estimate assumes use of 1% of NW land area, with 13% efficient panels and 4 kWh/m2 average insolation. Construction time from Fourth North-west Conservation and Electric Power Plan, Northwest Power Planning Council (NWPPC), 1998. appendix FSO. Real levelized cost of energy for PV and direct thermal based on capital cost, O&M, annual output and project life given in "Solar Energy Systems for the Million Solar Roofs Initiative," NWPPC, June 1998, assuming 6.5% after-tax cost of capital and 2.5% general inflation. Esti-mates do not include tax incentives or property taxes.
2. NWPPC Power Plan, op. cit. note 1. Germany's sunlight from How the Northwest Can Lead an Energy Revolu-tion, Atmosphere Alliance, 6/98, pg. 7.
3. "Real levelized cost" is a common way of comparing electricity from different sources. All expected costs for the project– including equipment, finance charges, maintenance and fuel – are cor-rected for inflation, amortized over the life of the project and divided by the amount of electricity that will be produced each year. Real levelized cost estimates are somewhat lower than actual average costs because they factor out the effect of infla-tion.
4. Line extension costs from Bill Edmonds, PacifiCorp, 6/99 Comparison to solar based on project parameters in note 1, assuming 1.5 kWa load, $7,000/kWp installed cost for modules and batteries and 6¢/kWh retail price for electricity. Other cost-effective uses from Photovoltaics: Advancing Toward the Millenium, National Renewable Energy Laboratory, 1996. Sales volume and prices from Worldwatch Institute.
5. NWPPC, op. cit. note 1

Graphics created by Matthias Fripp, 1999

Mr. CALVERT. Mr. Lepp, do you—

STATEMENT OF RAY LEPP, VICE PRESIDENT AND GENERAL MANAGER, WESTERN REGION, BIRMINGHAM STEEL CORPORATION

Mr. LEPP. Thank you, Mr. Chairman.

My name is Ray Lepp. I'm Vice President/General Manager of the Seattle division of Birmingham Steel. The steel plant is located in West Seattle, just minutes outside of downtown.

The plant has been in its current location on Elliot Bay since 1905. It is a permanent fixture in the city's landscape. In fact, virtually every school, hospital, skyscraper, stadium, bridge, airport in the Puget Sound area is made in part by the steel manufacturing plant, and thus it helps to create Seattle's landscape. We've also provided the steel for the Bonneville power dams in the past.

Before I address the two energy-related questions, I'd like to share a few things about our plant. Birmingham is a big recycler. All of our feed scrap is recycled material. More than 16,000 junk cars are recycled each month at the plant. Firearms from over 50 Puget Sound law enforcement agencies are melted down. We make new steel from cans, discarded appliances, and other scrap metal; thus we reduce solid waste destined for landfills and save energy for natural resources.

Birmingham employs up to 300 skilled workers at the plant, several of whom are third-generation employees who provide great living-wage jobs to people who may not fit the high tech mold of today's economy. Our employee turnover is less than 1 percent. We're an old industry but one that many people depend on.

Birmingham has invested over $145 million in the plant to acquire this facility in 1991. We've invested in pollution control equipment to reduce emissions, invested in noise reduction abatement, and improved the landscaping.

The plan is one of the most efficient fuel manufacturing plants in North America. Our environmental, community service, and employee safety programs have all been recognized with awards in the last year.

Electricity is an integral part of our process. As such, Birmingham requires a significant amount of electric energy to melt scrap metal to produce rebar, angle bar, and other merchant bar products that are used in construction.

Electricity is our number two cost at the plant; scrap metal is our number one. So why do I share this information? It's because I feel you need to know that this plant is at risk of shutting down. I need you to know that the steel industry is highly competitive.

With electricity being our second highest cost at the plant, these costs can make or break us. Many of our competitors around the country continue to have an advantage over us in this area. They get their electricity at a lower cost, whether it be imports from Utah or imports from China or Japan. The West Coast energy crisis is threatening our economic competitiveness.

So the questions you've raised are indeed timely, especially in light of Bonneville's projected rate increases.

Birmingham's electric facility, Seattle City Light, receives power from Bonneville. And those costs are passed on to us from other

rate payers. Seattle City Light has already increased our rates by 53 percent with an additional 47 percent projected increase coming this July.

The lower rainfall, the low snowpack, and ESA restrictions have hurt the region. But that's one of the risks that one assumes, being somewhat dependent on hydropower.

Bonneville is a great benefit to this region and one I'd fight to preserve. I know that the latest rate filing is controversial, given that it requires the aluminum companies to shut down for 2 years. That doesn't really seem right to me, but neither does the two-tiered rate proposal of the aluminum companies.

In fact, Seattle City Light estimated that the two-tiered rate would result in a cost increase to Birmingham Steel of roughly 6- to $10 million a year. Such a shift, when added to the 53 percent rate increases we've already had and the 47 percent July 1st, would place Birmingham in a hopeless situation.

I'm not sure what the answer is, but as plant manager of the facility, it's my responsibility and my duty to fight for and protect my 300-plus employees and 300 indirect employees.

What happens to your business if rates increase significantly? Simply stated, Birmingham will close its doors, and 300-plus employees will lose their jobs. A facility that employs several second-, third- and fourth-generation employees simply will go away.

No operator could sustain the type of increases with the rate incurred and operate this plant competitively among competitors who aren't faced with the same cost increases.

The only way we've survived this long is that several years ago, before the current energy crisis, Birmingham faced its own crisis. Our utility's electric rates were threatening our competitiveness and our viability.

We initiated discussions with our utilities to identify conservation strategies to reduce our load. Since that time, we've conserved more than 10 percent by replacing equipment, reducing lighting, and implementing other conservation strategies.

We believe we may be able to conserve an additional couple percent, but beyond that, we can't reduce demand without threatening our process.

We compete with imports and facilities that aren't affected, and we remain competitive on the strength of our award-winning energy conservation and 35 percent water conservation over the past 18 months.

To conclude, I'm here to tell you, the members of the U.S. Subcommittee on Water and Power, that this energy crisis is real, and our clients cannot sustain these increases and stay in business.

Thank you for your time.

Mr. CALVERT. Thank you.

[The prepared statement of Mr. Lepp follows:]

Statement of Ray Lepp, Vice President and General Manager, Western Region, Birmingham Steel Corporation

Good morning members of the U.S. Committee on Resources, Subcommittee on Water and Power. My name is Ray Lepp, Vice President and General Manager of the Seattle division of Birmingham Steel. The steel plant is located in West Seattle, just minutes outside of downtown. The plant has been in its current location since

1905 and is a permanent fixture in the city's landscape. In fact, virtually every school, hospital, skyscraper, stadium, bridge and airport in the Puget Sound area is made in part by the steel we manufacture at the plant, and thus, we've helped create Seattle's landscape.

Before I address the two energy-related questions you asked of me, I'd like to share just a few things about the steel plant:

- Birmingham is a big recycler. All of our feed scrap is recycled material—more than 16,000 junk cars are recycled each month at the plant, firearms from over 50 Puget Sound law enforcement agencies are melted down at the plant—we make new steel from cans, discarded appliances and other scrap metal. Thus, we reduce solid waste destined for landfills, and save energy and natural resources.
- Birmingham employs over 300 skilled workers at the plant, several of whom are third-generation employees, and we provide great living-wage jobs to people who may not "fit" into the high-tech mold of today's economy. Our employee turnover is less than 1%. We're an old industry, but one that many people depend on.
- Birmingham has invested over $145 million in the plant since acquiring the facility in 1991—we've invested in pollution control equipment to reduce emissions, invested in noise reduction abatements and improved landscaping—the plant is one of the most efficient steel manufacturing plants in North America. Our environmental, community service and employee safety programs have all been recognized with awards in the last year.
- Electricity is an integral part of the steel manufacturing process. As such, Birmingham requires a significant amount of electric energy to melt scrap metal to produce rebar, angle bar and other merchant bar products that are used in the construction of roads and buildings. Electricity is our number two cost at the plant—scrap metal is our number one cost.

So why do I share this information with you? I share this information with you because I need you to know that this plant is at risk of shutting down. I need you to know that the steel industry is a highly competitive industry, and with electricity being our second highest cost at the plant, electricity costs can make or break us. Many of our competitors around the country continue to have an advantage over us in this arena—they get their electricity at a lower cost. Whether it be Nucor in Plymouth Utah or imports from China . . . the West Coast energy crisis is threatening our economic competitiveness.

So, the questions you've raised are indeed timely, especially in light of BPA's projected rate increases. Birmingham's electric utility, Seattle City Light, receives power from BPA, so those costs are passed on to us and other ratepayers. Seattle City Light has already increased our rates by 53% with an additional 47% increase coming this July. The lower rainfall, low snowpack and ESA restrictions have hurt this region, but that is one of the risks one assumes being somewhat dependent on hydropower. BPA is a great benefit to this region and one that I'd fight to preserve. I know that the latest rate filing is controversial given that it requires the aluminum companies to shut down for two years. That doesn't really seem right to me, but neither does the "two-tiered rate" proposed by the aluminum companies. In fact, Seattle City Light estimates that the "two-tiered rate" would result in a cost increase to Birmingham of roughly $6–10 million a year. Such a shift, when added to the 53% rate increases we've already incurred and 47% rate increases proposed for July 1st, would place Birmingham in a hopeless situation. I'm not sure what the answer is, but as plant manager of this facility, it is my responsibility and my duty to fight for and protect my 300 plus employees and 300 indirect contract employees.

What happens to your business if rates increase significantly? Simply stated, Birmingham will close its doors and the 300 plus employees will lose their jobs; a facility that employs several second, third and fourth generation employees will simply go away. No operator could sustain the type of increases we've already incurred—a 53% rate increase already imposed and an additional 47% rate increase proposed for July 1st—and operate this plant competitively when its competitors aren't facing the same cost increases. Add the latest increases to the estimated $6–10 million "two-tiered rate" shift and there is no question that we would go out of business.

The only way we've survived this long is that several years ago, before the current energy crisis, Birmingham faced a crisis of its own—our utility's electricity rates were threatening our competitiveness and economic viability. We initiated discussions with our utility, Seattle City Light, to identify conservation strategies to reduce our load. Since that time, we've conserved more than 10% by replacing equipment, reducing lighting and implementing other conservation strategies. We believe we may be able to conserve an additional 2–3%, but beyond that, we cannot reduce demand without threatening our manufacturing process. We compete with imports and facilities that are not impacted by the West Coast energy crisis. We have re-

mained competitive on the strength of our award-winning energy conservation and 35% water conservation efforts over the past 18 months.

How does it affect your employee's production and your competitiveness? I believe that I've already answered this—simply stated, production will decrease because we can't compete with competitors who aren't experiencing the same cost increases.

To conclude, I'm here today to tell the members of the U.S. Subcommittee on Water and Power, that this energy crisis is real and that this plant cannot sustain these increases and stay in business.

Thank you for your time. I'm available to answer questions.

Mr. CALVERT. Dr. Anderson?

STATEMENT OF JAMES J. ANDERSON, ASSOCIATE PROFESSOR, SCHOOL OF AQUATIC AND FISHERY SCIENCES, UNIVERSITY OF WASHINGTON

Dr. ANDERSON. Thank you, Mr. Chairman.

I'm Associate Professor in the School of Aquatic and Fishery Sciences at the University of Washington.

I've been working on Columbia River salmon and power issues for two decades. They went by quickly.

I—the first time I presented before this Committee was in 1995. At that time, the fish runs going up the Columbia were the lowest on record. There were 10,000 fish that came back in the spring of that year.

This year, we have 350-—370,000 fish that returned to the river, plus the drought. That was a tremendous number of fish. In fact, it's a record since the time we've been keeping records, going back to the '30's. We have more fish that have gone up the river this year than ever before.

In my testimony, I show a couple of graphs that give you a visual impact of what this is. This is completely unexpected, particularly since in 1995, we were talking about taking out the dams. We thought fish were going to be extinct in a very short period of time.

Why are these runs coming back right now? Well, what I was saying back then—as many scientists who were believing and finding through their data—there were great variations in the ocean which are driving—is a major driving factor for the productivity of these stocks.

So what I want to do is give you a little characterization of what that variability is and then how the different actions we are taking in the hydrosystem affect the survival of these stocks relative to that variability in the ocean.

I present in my testimony a number of figures which show the—the daily return of runs over 40 years of the major stocks into the major regions of the—of the—of the basin. If you look at those, what you find is there is a variability, a scale change. In the '60's and '80's, the stocks were fairly high. In the '70's, in the '90's, they were—they were low. And it appears again that the stocks are increasing. Certainly this year and the last year, we've had some better runs into the system, in general. And this year, we have a spectacular run.

So we have a little reprieve from extinction, at the very—at the very least. And what we need to do is, in short, to begin to use the information that we have on the system so we can take a little load

off demand off the hydrosystem and still be able to—to recover the fish, still be able to generate electricity.

What this means is we have to use the information we have available, and we have to use it in a rational manner. I don't believe that we are doing—clearly, we are not doing as well as we could with that.

Six years ago, we thought what we needed to do was take out the dams. Now we realize that there is a multitude of factors.

What I want to do now is discuss the basic things that we do in the hydrosystem: flow augmentation, spill, and transportation, in fairness to the ocean, to give you kind of an idea of how this all needs balance with each other.

There's been a lot of studies looking at the relationship between flow and survival. We find that survival—to plot the year-to-year survival with the year-to-year flow, there is a relationship.

The higher—the wetter the water year, the more survival you have going through the river; the more fish come back. If you look within a season, if you see how the flow changes from the beginning of the migration through the end, there is no relationship we've been able to find in the hydrosystem between flow and survival.

We've talked about water augmentation. This does not affect flow. It's not a significant factor that we can show any impact. In fact, it could be—in some situations, water augmentation warms the system, and it could be detrimental to the fish.

The point on "spill" is spill has a very small impact. It has a theoretical impact. But compared to other measures we can take, it's very expensive and very ineffective. Transportation is the most effective way that we have to get fish through the river.

This year, we have—for every one fish—for every ten fish that come back through in-river routes, we have 15 fish that come back through transportation. The river transport studies show that this is a good way to move fish; we should continue to do this.

Now, the final point I want to make is that the ocean is a factor. It's a big factor. In 1995, we had a quarter percent of the fish come back. This year we have on the order of 2 to 3 percent. This is a—a tenfold factor, in a relative sense, a thousand percent increase in survival because of the ocean. Our hydrosystem factors, in a relative sense, might give us a 1 to 10 percent increase.

Now, my final point, then, if we understand and factor in what the ocean does, we have some flexibility in how we operate the hydrosystem. We don't—I believe we do not have to make draconian measures in the hydrosystem when ocean systems exist.

And I'll conclude my testimony with that.

Mr. CALVERT. Thank you, Doctor.

[The prepared statement of Mr. Anderson follows:]

Statement of James J. Anderson, Associate Professor, School of Aquatic and Fishery Sciences, University of Washington

My name is James Anderson; I am an Associate Professor in the School of Aquatic and Fishery Sciences at the University of Washington. My research over the past two decades has involved Columbia River salmon and the influence of the hydrosystem and climate on the survival and productivity of the stocks. I wish to thank the Power Water Subcommittee for this opportunity to testify on the current science and status of fish populations in the Columbia River system.

Background

I first appeared before this committee in June of 1995 and testified on the state of Columbia River salmon (Anderson 1995). That spring the salmon run in the Columbia River was the lowest ever recorded. In my testimony I explained how scientists were finding that throughout the North Pacific marine populations were correlated with decadal-scale patterns of ocean temperatures and currents. I suggested that the very low salmon populations were in part due to climate change. The young salmon smolts were entering a warm ocean in which food was scarce and warm-water predators were abundant. I concluded that the fate of the endangered salmon was strongly determined by what happened in the ocean (See Anderson 2000 for summary). At that hearing the committee also heard from witnesses claiming that the fish were doomed to extinction unless the Snake River dams were removed. The hearing encapsulated an ensuing scientific debate, reduced to whether the salmon's decline was nature's fault or the dam's fault.

Now, six years later the region is face with a near record drought, the value of the water has raised the cost of salmon recovery to billions of dollars, and the largest spring chinook run in 40 yrs has just returned to the Columbia. The question is no longer whether the ocean is major contributor to population variations. The question now is what is the real value of recovery measures in terms of fish survival. In my testimony I review the status of the stocks and the scientific information on the effectiveness of current hydrosystem actions to aid fish survival.

Salmon population status

Returns of wild salmon are not yet available for this year, but the counts at dams, which include both hatchery and wild fish, indicate a good year for 2001 following on the good returns from 2000. Over 360,000 spring chinook passed Bonneville dam this spring. On the peak day, twenty seven thousand fish passed Bonneville, which is nearly three times the entire spring run in 1995. illustrates how incredible the difference was between the two years. This year the run is five times larger than the ten-year average. Last year 177,000 spring chinook returned, which was one the largest run in 20 years.

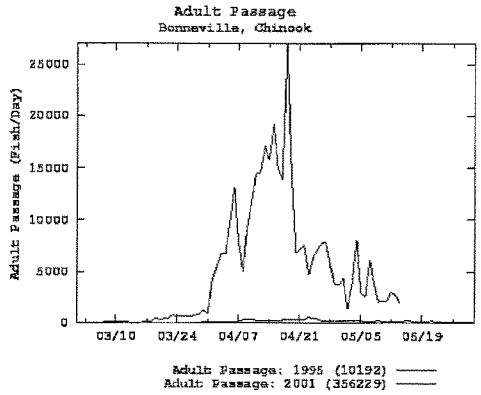


Figure 1. Daily Passage of spring chinook at Bonneville Dam in 1995 and 2001 (From DART). Note the 1995 passage barely registers compared to the 2001 passage numbers.

Figures 2 through 8 show the daily counts of adult salmon returning to the Snake and the mid–Columbia and put the recent runs in a historical context spanning 40 years. The Snake River chinook population was low in the early 1980s and throughout the1990s. It increased in 2000, and this year the run was the largest on record.

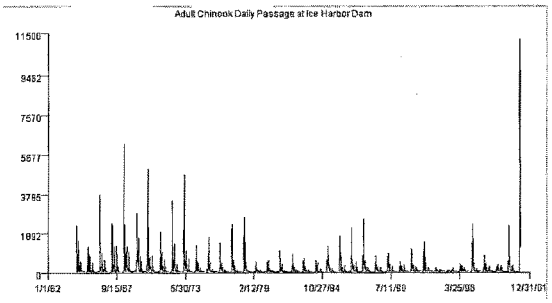


Figure 2. Daily passage of chinook into the Snake River Basin

The Snake River sockeye exhibited a decline in the early 1980s and reached near extinction levels in the 1990s. However, the captive brood program and improved ocean conditions are likely factors attributable to the small increase in 2000 ().

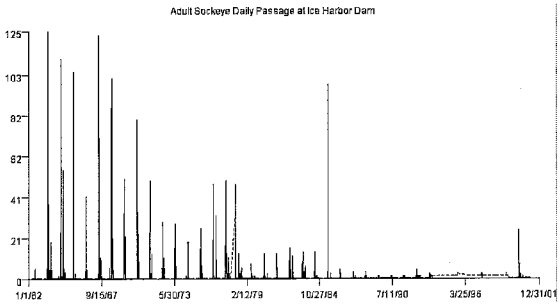


Figure 3. Daily passage of sockeye into the Snake River Basin

Snake River steelhead population was low in the 1970s and has increased largely through a hatchery program. Currently, the wild run is about 10% of the hatchery run ().

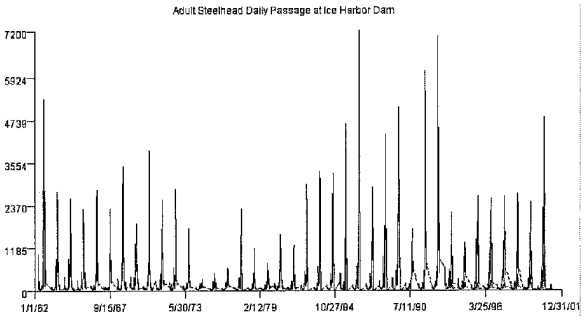


Figure 4. Daily passage of steelhead into the Snake River Basin

In the Mid–Columbia, the chinook were also low in the 1970s, but have improved over the last two years presumably because of improving ocean conditions ().

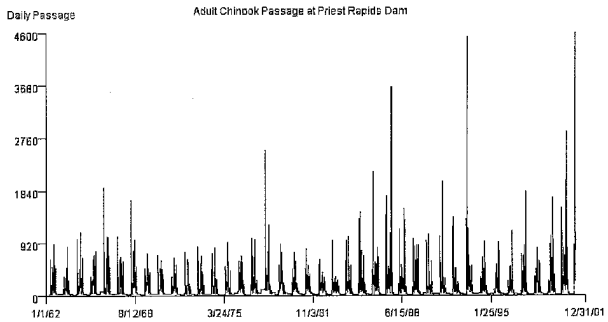


Figure 5. Daily passage of chinook into the Mid-Columbia Basin

Mid-Columbia sockeye returns were low in the1990s but improved in 2000 ().

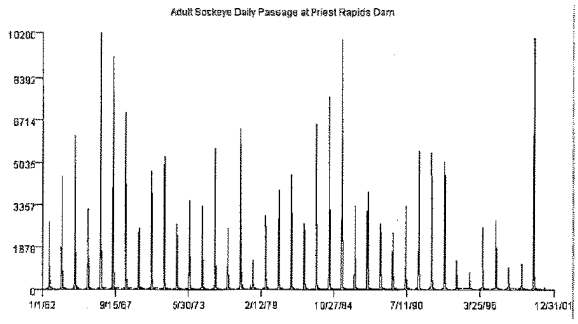


Figure 6. Daily passage of sockeye into the Mid-Columbia Basin

The mid–Columbia steelhead run has been small for 40 years. It was especially low in the mid 1990s and increased in 2000. The run is essentially maintained as a hatchery program ().

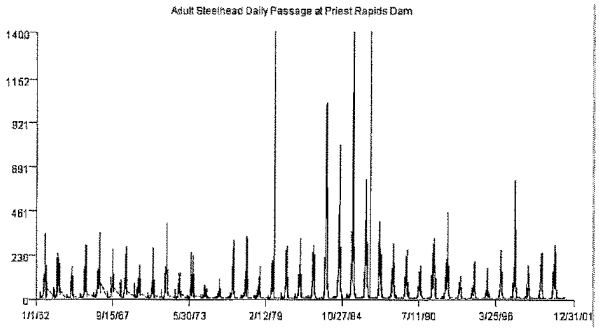


Figure 7. Daily passage of steelhead into the Mid-Columbia Basin

The passage of chinook at McNary Dam characterizes the total Snake and Columbia River runs. Note the double peak each year. The first peak represents the Snake River spring chinook and the second peak is mostly composed of Hanford Reach fall chinook. The total run was low in the 1970s and the 1990s. Again, this year's return is the highest in the record ().

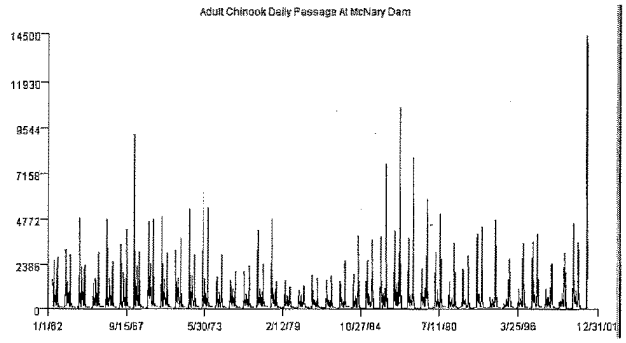


Figure 8. Chinook passage at McNary Dam

Finally, to put the 2001 drought into perspective, the daily flow at McNary Dams between 1962 and 2001 is illustrated in . Three significant droughts have occurred: 1973, 1977 and 2001. In these years the spring runoff peak is essentially missing from the daily record.

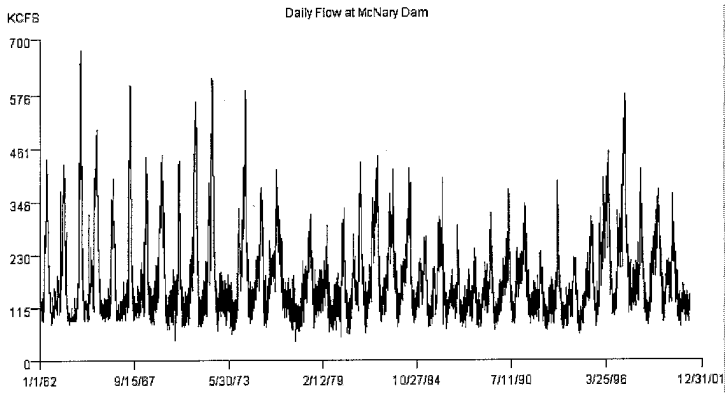


Figure 9. Daily Flow at McNary Dam

Several general characteristics are noteworthy in these records. First, the returns represent both hatchery and wild stocks with wild fish dominating the runs in the early part of the record and hatchery fish dominating in the recent years. Second, the records demonstrate that salmon populations vary on decadal scales and between years. Stocks were generally higher in the 1960s and 1980s and lower in the 1970s and 1990s. Year-to-year variations in all stocks are considerable. It is not uncommon for a stock to increase or decrease by a factor of two to three from one year to the next.

Status of Salmon Science

In my testimony six years ago I presented information that the ocean was a significant factor in determining the survival of salmon populations. This hypothesis was not controversial to many ecologists, but it was largely ignored by Columbia River fishery managers, who attributed the decline of the stocks to the hydrosystem. Today, with six additional years of research coupled with a significant change in the ocean there is acceptance that the year-to-year and decadal scale variations typified in the figures above cannot be attributed to any single factor; be it the ocean currents, sea surface temperatures, coastal winds, river flows, or dam operations. Because many factors are beyond our control, fishery managers have focused on hydrosystem operations as primary recovery measures: flow regulations, river temperature regulation, and dam operations. The strategy assumes that managing the hydrosystem within specified physical standards will improve fish survival and facilitate fish recovery.

However, because of the increasing value of the water and concerns as to the effectiveness of control measures, the strategy of operating the hydrosystem according to physical standards alone is not sufficient. Managers need to base the physical actions in terms of the resulting biological impacts on the salmon and especially in terms of survival. The effectiveness of actions needs to be put in the perspective of their contribution to the overall life history of the fish. I will briefly discussion the major hydrosystem actions and their effectiveness.

FLOW AUGMENTATION

A significant question during this drought concerns the effectiveness of flow augmentation in improving fish survival. To address this question it is important to first realize that a relationship of seasonal flow and smolt survival within a year, or a relationship of flow and survival between years, does not imply flow augmentation will increase survival. Flow augmentation is produced by scheduled releases from storage reservoirs and by limiting municipal and agricultural withdrawals. Flow augmentation does not change the yearly averaged flow; it only reshapes the runoff over the season. Flow augmentation has a small and variable impact on the natural seasonal flow, temperature and turbidity, because the natural patterns are driven by the unregulated tributary runoff while flow augmentation is mostly from storage reservoirs.

Based on flow and smolt survival research, a relationship has been found between yearly-averaged flows and the survival of chinook and steelhead passing through the hydrosystem. However, the same research demonstrates that seasonal flows are not correlated with hydrosystem survival. Because flow augmentation makes up a small portion of the seasonal flow, it too is not correlated with smolt hydrosystem survival.

A relationship between seasonal flow and survival of fall chinook migrating from Hells Canyon to Lower Granite Dam has been observed in studies. Here again, the contribution of flow augmentation to this seasonal flow is small and the potential impact on survival is not measurable. Furthermore, there is a reasonable possibility that flow augmentation from the Hells Canyon dam complex may in some years decrease fish survival (Anderson, Hinrichsen and Van Holmes 2000). The research indicates that the natural seasonal patterns of flow, temperature and turbidity are correlated, so simple correlations any of these variables with smolt survival does not identify which one may affect survival. Based on fish bioenergetics, increased temperature will increase smolt mortality and since water releases from Hells Canyon can increase the Snake River temperature, augmentation can increase mortality. Furthermore, in these studies fish travel time was uncorrelated with flow, so it has no effect in reducing smolt exposure time to predators.

Simply put, flow survival studies conducted over 8 years indicate that the impacts of flow augmentation on smolt survival are not measurable at best, may be neutral, and in some situations may decrease survival. Potential impacts of flow augmentation on survival can be estimated with models. However, the benefits were not estimated in the NMFS Biological Opinion.

DAM PASSAGE AND SPILL

Studies on smolt dam passage indicate benefits for smolts passing dams in spill water compared to passing through bypass systems and turbines. However, recent model analyses show the benefits of spill are small. Not spilling at Columbia River dams this year decreases the total passage survival of Snake River smolts from about 50% to 49%; a difference of 1%. The net change for Mid Columbia smolts is about 10% and for lower Columbia River smolts is about 3% (NWPPC 2001).

Considerable progress has been made on identifying the impacts of hydrosystem operations on the upstream migration of adult salmon (Bjorn et al 2000). Of concern is the effect of spill. Periods of high spill appear to delay salmon passage and increase fall-back across the dams.

TRANSPORTATION

The vast majority (80 to 98%) of salmon smolts from the Snake River reach Bonneville tailrace in barges. Ninety-eight percent of the fish survive the barge trip, but after release the fish die at a higher rate than smolts that have arrive at Bonneville tailrace via in-river migration. If this differential mortality of transported fish relative is equal to the mortality of smolts passing through the river, then barging has no benefit over in-river passage. In normal and low water years it is believed that barging is better for Snake River salmon and this is the preferred strategy for this year. Barging mid–Columbia salmon is less effective because the fish must migrate

through several of dams before they reach McNary Dam, from which can be transported.

Ultimately the efficacy of transportation depends on the level of differential mortality. Few reliable estimates are available and it appears to vary between species, over the season, and from year-to-year. Furthermore, the reason why transported fish die at a greater rate than fish that have passed through the hydrosystem is unclear. Hypotheses, focusing on stress in transportation, suggest it may be possible to improve the transportation system, making it the preferred passage route.

OCEAN EFFECTS

Over the past six years a number of studies have correlated ocean variables and marine populations. For example, Alaskan and west coast salmon have an inverse relationship with decadal scale cycles in ocean currents and temperatures (Hare, Mantua and Francis 1999). Between 1977 and 1998 ocean conditions, characterized by the Pacific Decadal Oscillation (PDO), favored Alaskan salmon and were detrimental to west coast salmon. In 1998, the PDO reversed and correspondingly west coast salmon stocks increased while many Alaskan stocks declined. Studies in the Oregon coastal waters confirm a recent and significant increase in the abundance of salmon food (Peterson 2000). An article in the Seattle Times noted "This is the third spring in a row that scientists working out of Newport have encountered a fertile Pacific, a trend that began in one of the wettest Northwest years on record and has continued even as onshore weather patterns this year set the stage for a severe drought (H. Bernton, Seattle Times staff reporter, May 09, 2001)

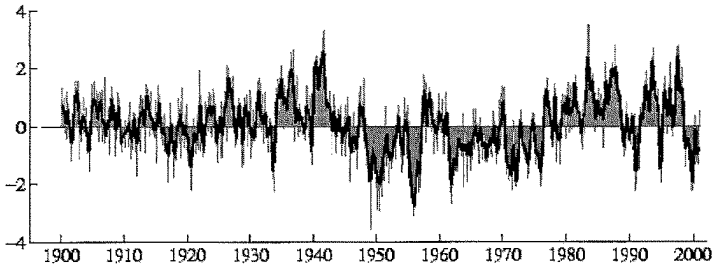


Figure 10. A one-hundred year record of the "Pacific Decadal Oscillation" (PDO). Positive values indicate a warm ocean; negative values indicate a cool ocean. Major changes in northeast Pacific marine ecosystems correlate with phase changes in the PDO; warm eras have seen enhanced coastal ocean biological productivity in Alaska and inhibited productivity off the west coast of the contiguous United States, while cold PDO eras have seen the opposite north-south pattern of marine ecosystem productivity (From http://www.atmos.washington.edu/~mantua/).

COMBINED EFFECTS OF OCEAN AND HYDRO OPERATIONS ON SALMON

An important step in setting hydrosystem performance standards and selecting recovery actions is to recognize and adjust for the considerable influence that ocean and climate cycles have on salmon populations. The improved ocean conditions over the past three years have benefited both wild and hatchery stocks and are a major factor in the record returns of spring chinook. The data suggest ocean factors outweigh the effect of hydrosystem operations. Comparing smolt to adult survival from the 1995 outmigration to the 1998 and 1999 outmigrations, the survival has increased from 0.25% in 1995 up to about 2% in 1998–1999 period. This 1000% increase in relative survival can creditably be attributed to the increased productivity in the ocean. In comparison, the relative change in survival with spill and flow augmentation have been estimated to be on the order 1 to 10%. This comparison to the poor conditions in the mid 1990s is relevant because virtually all estimates of salmon extinction and recovery probabilities assume the ocean remains in the extreme poor state of the 1990s.

A recent paper on recovery options concluded that even dam breaching would not recover the stocks under the conditions that existed for brood years 1990–1994 (Kareiva, Marvier, McClure 2000). However, the paper did not mention that the years used in the analysis represented some of the warmest years on record (See

the PDO in). If the analysis were revisited, including both good and bad ocean conditions, the conclusions would be significantly different. In fact, an analysis in the Plan for Analyzing and Testing Hypotheses (PATH) demonstrated that with a regime shift back to cool ocean conditions, the stocks would recover without changes to the hydrosystem (Marmorek, Peters, Parnell 1998). The majority of PATH participants rejected this hypothesis as unrealistic, with little chance that the smolt-to-adult survival could rise above 1%. However, the recent shift in the ocean follows the analysis assumptions, and if the ocean survival persists through this decade, the PATH analysis suggests the stocks would recover without aggressive the hydrosystem operations. However, most analyses on salmon recovery to date consider scenarios that require draconian measures to save the stocks from extinction. Conspicuously absent are analyses that include ocean cycles.

I am not suggesting that salmon will recover irrespective of societal efforts. Such a stance would be irresponsible. But to implement performance measures without regard to their benefits in relationship to the status of the ocean is equally irresponsible. Science, in service of salmon recovery and management, must assess the impacts of physical actions in terms of their biological effects on the stocks. The science must quantify biological performance through monitoring, and where the data is insufficient, through biologically realistic models. Furthermore, the science must seek to understand the mechanisms by which the environment affects salmon survival.

The improved ocean conditions give salmon a temporary reprieve from extinction. But, eventually the ocean will warm again and with or without a drought, the competing demands for the water will be great. If we continue to increase our understanding of salmon ecology and if we begin to realistically assess the benefits of recovery actions, we may be able to meet the coming challenge. However, if we forgo learning and disregard quantified analyses in making decisions, salmon management could face a failure of public trust and salmon recovery would be jeopardized.

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Mr. CALVERT. Mr. Rob Walton.

STATEMENT OF ROBERT G. WALTON, ASSISTANT MANAGER, PUBLIC POWER COUNCIL

Mr. WALTON. Thank you, Mr. Chairman, members of the Subcommittee.

Thank you very much for this opportunity to testify about job management and energy availability in the Pacific Northwest.

My name is Robert Walton. I'm the Assistant Manager of the Public Power Council, a regional association representing the consumer-owned utility customers of BPA.

Our members include municipal and cooperative utilities and PUD's in five states. You've mentioned Snohomish PUD, Tacoma City Light, Eugene Water and Electric Board. Those are some of our members.

I submitted written testimony to you, including analysis by the Northwest Power Planning Council staff on the power supply situation and the biological impact of reduced spill.

I'd like to depart from those written comments in my 5 minutes and summarize my perspective on the short- and long-term issues that we face.

In the short term, as many of the speakers have described, the drought has put tremendous pressures on the Federal agencies in the region. I see a tug-of-war, which is pretty clear, over the issue dozzer, which is how to use the water in the Columbia River this year.

Pulling in one direction are the fish advocates. And you've heard from the Yakima tribal leader, Randy Settler, today. And there are others who argue that we should support the out-migrating smolt by spilling water—spill—spill water, to implement the Endangered Species Act, the Federal trust and treaty responsibilities, and non-tribal harvest.

Pulling in the other direction are members of the power community and many members of the—the economic sector in the region.

Mr. DeFazio said earlier that the public won't tolerate an unreliable power system; this isn't India. That's exactly why we're arguing against spill this year. Many people consider the water in this drought, in this energy crisis too valuable to spill.

And some of the evidence suggests that the biological benefits from spilling this year are not sufficient to warrant the high cost.

As Dr. Anderson suggested, we have a record run this year of spring chinook. And it's interesting to note that the harvest rate on the salmon in the river—which includes the nonlisted and the listed species—has gone up this year from 9 to 15 percent.

So in our written comments, PPC supports the declaration of emergency—the—operating the Federal system to meet load supporting—supports the criteria to maintain a reliable system and would support the extraordinary measures that Mr. Wright described.

We certainly support the responsibility of the power system to mitigate the impacts that the dams have on fish and wildlife.

In the longer term, I'd like to offer my perspective on some failures that I see interestingly in common between energy policy and salmon management policy. I think both can be described as being stuck in the middle between alternative courses of action.

The result in both salmon and energy policy is irrational decisions that are being made that take us in neither direction.

I'd like to quote from—from my written testimony from a passage that was published in May 1994 by the first National Marine Fisheries Service Recovery Team, the so-called "Debbon" (phonetic) team—quote, "There is no directed authority or accountability to ensure effective management of the overall system.".

By the way, they're talking about fisheries' management, but I'd like you to think in terms of both fish and power.

The bottom line is a classic situation. Among a myriad of agencies and interests, no one, really, is in charge. Institutional, jurisdictional, state, and Federal boundaries make rational overall fisheries management decisions impossible. Each agency has its own area of designated authority and responsibility and gets its own funding and sets its own goals, leading to its own special projects and agenda, all of which are budget-dependent.

It seems to me in the fish arena, we have a—we're stuck in the middle between two potential salmon management strategies. One, as advocated by National Marine Fisheries Service, would have us manage their tiny populations of naturally spawning native wild fish. If so, it seems to me that there's a very difficult opportunity—chance that the Federal agencies will be able to meet their—their obligations to provide harvest to the tribal and nontribal fishermen.

If this continues to be our salmon policy, it's hard to justify killing these salmon for fun and profit. As an alternative, they could manage for the state-of-the-art use of artificial production hatcheries to produce the kind of fish that can spawn naturally or in hatcheries to try to build the fish runs that are capable of harvest.

On the energy side, I don't think I need to tell members of the Subcommittee—you've already stated it very eloquently today—we're stuck in the middle between a regulated system that had a clear assignment of responsibility, a clear obligation to serve, a clear obligation to maintain reserves, a clear obligation to keep the rates down and, on the other side, as some people have described it, the genius of the marketplace, with a deregulated system. We're stuck in between the combination of both the—the—the power and the fish policies—is that the regional execs are being asked to make decisions right now in the short term—spill or not spill—when, in fact, the long-term policies behind both fish and power strategies, in my mind, are not clear enough to lead us to long-term success.

Thank you.

Mr. CALVERT. Thank you.

[The prepared statement of Mr. Walton follows:]

Statement of Robert G. Walton, Assistant Manager, Public Power Council

Mr. Chairman, Members of the Subcommittee: thank you very much for this opportunity to testify about Drought Management and Energy Availability in the Pacific Northwest. These are very timely and important subjects for the Subcommittee to consider and I appreciate your interest and attention.

My name is Robert Walton. I am the Assistant Manager of the Public Power Council (PPC), a regional association representing the consumer-owned utility customers of the Bonneville Power Administration (BPA). PPC's members include municipal and cooperative utilities and public utility districts (PUDs) in 5 states. These consumer-owned utilities purchase power and/or transmission from BPA and pro-

vide the largest share of BPA's income, which is used to fund BPA's treasury payments and the fish and wildlife program, along with other programs and obligations.

As the entities that pay the bills, we have a direct interest in scrutinizing BPA's operations and expenses regarding power generation and fish and wildlife mitigation. But as consumer-owned utilities, we do not merely seek to keep the lights on and reduce costs. We also reflect our customers' interest in a healthy environment with thriving fish and wildlife populations. What we seek is cost-effectiveness, program accountability and demonstrable results.

My testimony today addresses two issues.

- How will Federal agencies operate the Federal Columbia River Power System (FCRPS) this year: spill water over dams to increase survival of salmon or use that water to maintain a reliable electrical power system?
- General concerns about a lack of accountability in the management of salmon and electrical reliability.

PPC's Recommendation to the Federal Agencies Regarding Operation of the Columbia River

PPC commends the Federal agencies for assigning top priority to maintaining power system reliability and public safety. We recommend the agencies continue to utilize the provisions in the Biological Opinion that allow for emergency operations of the Federal Columbia River Power System.

In particular, PPC supports the declaration of a power emergency and continued implementation of the April 13 draft operating plan for the Federal Columbia River Power System (FCRPS). (See letter to BPA Acting Administrator Steve Wright on May 10, Attachment A.) Although the Biological Opinion calls for extensive "spill" to aid salmon migration, the draft operations plan determines the amount of water spilled for fish based on the volume forecast for water runoff in the system. Due to the extremely low runoff forecasts to date, the Federal agencies would not spill any water this year under the current criteria.

Top Priority for Water Stored in the FCRPS Should Go to Maintaining the Reliability of the Pacific Northwest Power System

The Federal agencies have established criteria to ensure the region can meet power demand in the near term and next winter. For example, criterion 2 in the Federal agencies' operating plan established a goal of maintaining a 5% loss of load probability in future months. PPC supports this criterion, but is troubled that the drought and West Coast energy situation may make it impossible for the agencies to maintain that level of reliability. In fact, the region is working hard to maintain a reliability in the 20% to 26% range. To PPC, a 20% chance that the region would fail to meet load this winter is not consistent with a reliable power system.

Faced with a goal of 5% loss of load probability and analyses that indicate a 20% or higher loss of load probability, PPC concludes that the prudent course of action for the Federal agencies is to store as much water as possible in the FCRPS to meet future load.

Without the declaration of a power emergency and implementation of the current operating plan, the Federal agencies would be forced (under the 2000 Biological Opinion) to spill water over the dams instead of running it through the generators. The Northwest Power Planning Council has estimated (see Attachment B) that this water, if run through the generators, would produce over 6600 mw-months of energy in the Federal system. PPC supports the conclusion reached by Council and BPA staff that the loss of this amount of energy would do serious harm to the region's energy supply, increasing the risk of blackouts in the Northwest.

PPC's member utilities are participating, along with Investor–Owned Utilities, the Governors and many others in the region, in a widespread effort to reduce electrical load and increase electrical generation. There are some signs of progress in these efforts. The potential consequences of a power system failure in the middle of winter, however, are so onerous that PPC urges the Federal agencies to err on the side of ensuring the reliability of the power system.

The Impact that Spilling Water would have on the Economy of the Pacific Northwest

In addition to reducing power system reliability, spilling large amounts of water would cost the region a lot of money. The Council estimated the value of power that could be generated if spill were eliminated to be more than $ 1 billion (see Attachment B). These are costs that would ultimately be borne by the region's ratepayers.

BPA's utility customers face the prospect of a wholesale rate increase this October estimated to be between 80% and 250% over current levels. The impact of such an increase could have devastating impacts on the region's economy, resulting in the loss of thousands of jobs and economic harm to the region's residential customers. If Federal agencies were forced to spill water for fish, the additional costs would add

to the size of the rate increase, resulting in additional economic displacement in the region.

The Impact that Elimination of the Spill Program this Year would have on Salmon

BPA's customers understand and support the obligation to mitigate for the impact of the dams on fish and wildlife in the Columbia Basin. However, we haven't always supported the specific measures that have been implemented. The power industry has been skeptical about the biological benefits of flow augmentation and spill for years. In times of high energy prices, the cost-effectiveness of spilling water to increase survival of juvenile salmon has been particularly suspect.

PPC's decision to support elimination of spill this year is based in large part on recent preliminary analyses by the Power Planning Council Staff (see Attachment C). Using a National Marine Fisheries Service (NMFS) model and data, the Council analyses suggested that relatively few adult salmon would be lost as a consequence of eliminating the 2001 spill program. One of the major reasons for this is the fact that NMFS has decided to put most of the fish in barges, not left in the river this year. The analyses suggested that elimination of spill would cause a modest decrease in survival of the juvenile fish in the river, but the impact on the entire outmigration was only a few percent. After considering the low ocean survival of these fish, the analyses suggests the impact of eliminated spill would result in the loss of a relatively small number of adult salmon.

A number of scientists for fisheries agencies and tribes have criticized the Council staff's preliminary analysis. Some of their criticisms may have merit, but even if the preliminary analyses are off by an order of magnitude or more, point seems to be the same: we could significantly reduce the reliability of the region's power supply and increase the cost of electricity in the current situation, but save a relatively small number of salmon in the process. From a power system perspective, it would be imprudent to spill water this year, given the apparent ranking of costs and benefits.

Who is in Charge of Keeping the Lights on and Managing the Salmon?

In May, 1994, seven experts appointed by NMFS released their report entitled: "Snake River Salmon Recovery Team: Final Recommendations to National Marine Fisheries Service." In the report (page III–1), they stated:

> There is no directed authority or accountability to ensure effective management of the overall system. The bottom line is a classic situation: among myriad agencies and interests, no one really is in charge. Institutional, jurisdictional, state and Federal boundaries make rational overall fisheries management decisions impossible. Each agency has its own area of designated authority and responsibility, gets its own funding, and sets its own goals—leading it to its own special projects and agenda, all of which are budget dependent. For example, in the early 1980s, the NPC developed a water budget with hopes that rigorous data would be collected to test and enhance its effectiveness. For more than a decade, the critical data have not been collected.

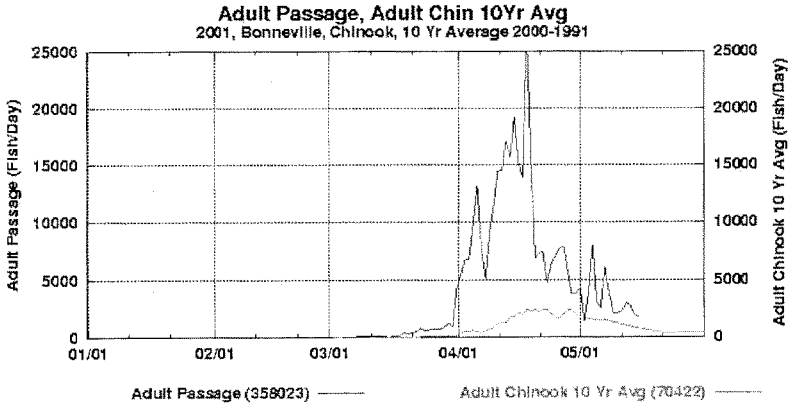
Unfortunately, this six year-old quote still rings true in 2001, but now it also seems to make an important point regarding the management of electrical power as well as salmon resources.

As the Pacific Northwest and the West Coast face increasing challenges to maintain electrical power system reliability, the quote from the recovery team applies: no one is in charge of keeping the lights on. That is, no single entity or person is has the responsibility to ensure that the lights stay on in the region and along the West Coast. BPA, NMFS and other Federal agencies are making decisions to generate or spill on the Columbia River, but they don't have responsibility for all the electrical power control areas in the region. Neither FERC nor the Department of Energy appears to have clear responsibility to maintain a reliable power system. Individual utilities may have an obligation to serve, but not beyond their service territories. Certainly the independent power producers don't have a responsibility to keep the lights on.

Regarding the management of salmon, the Endangered Species and Northwest Power Acts, trust and treaty relationships to tribes, international treaties and other statutes all apply to the Federal agencies. As the recovery team stated in May, 1994, no one entity has taken charge of managing the salmon resource. One result of this situation is a failure to establish clear goals or a definition of success in terms of salmon recovery.

We would like to offer one example of the current situation. It is a fact that the number of salmon and steelhead species listed under the Endangered Species Act in the Northwest is increasing, and some of those species are in serious decline.

However, a significant portion of ratepayer money directed at salmon recovery over the last 20 years has been spent on developing a huge hatchery program. The result? This year's return of spring chinook above Bonneville Dam is the largest in over 60 years, but most of the fish are of hatchery origin. As the following graph shows, this year's return is about five times higher than the ten-year average.



Source: Data Access in Real Time, Columbia Basin Research, School of Aquatic & Fishery Sciences, University of Washington

This large number of salmon ought to be good news, but it isn't exactly a success story, because there is no way to harvest the hatchery fish without killing fish protected by the Endangered Species Act. As a result, salmon managers are faced with the choice of either killing the hatchery salmon to keep them from spawning (assuming they can identify the hatchery salmon) or having them spawn in the same waters as the protected salmon and thereby changing the genetic makeup of the protected salmon. This is one of several consequences of a failure to establish clear lines of responsibility.

PPC would like to participate in and support a reliable and affordable electrical power system as well as a successful salmon rebuilding effort. Without clear lines of responsibility and accountability, however, success is much harder to achieve.

Thank you for this opportunity to testify before your Subcommittee.

ATTACHMENT A

May 10, 2001

Mr. Stephen J. Wright, Acting Administrator
Bonneville Power Administration
905 N.E. 11th Avenue
Portland, OR 97232

RE: To Spill or Not to Spill

Dear Steve:

The choice of whether to spill at Federal dams in May forces the Federal agencies to manage competing risks. PPC believes the agencies should continue to assign top priority to maintaining power system reliability and public safety.

Specifically, PPC believes that the agencies should continue to operate the Federal Columbia Power System pursuant to the declared power emergency and implement the criteria in the April 13 Draft Plan. The criteria in the plan are objective and reasonable, especially in light of the substantial risk that BPA will not be able to meet its power obligations.

Grant PUD recently asked FERC to approve a temporary emergency variance of the interim spill requirements at Grant's projects. Specifically, Grant makes this request so that the District can make that generation available for critical regional energy needs, for the purpose of displacing generation at other hydro projects where spill may be more effective in passing fish this year than at the District's Priest Rapids Project and/or for the purpose of facilitating other power and fishery measures in this unusual low water year.

At this point, PPC sees the Grant proposal as the only compromise available to the Federal agencies in their attempt to balance in-river survival with power system reliability. Therefore, PPC supports the proposal—if it is approved by FERC.

We appreciate your efforts to implement the criteria in the April 13 Draft Plan while looking for ways to minimize costs and risks to ratepayers.

Sincerely,

C. Clark Leone
Manager

ATTACHMENT B

EXECUTIVE SUMMARY

The ongoing drought has focused concerns about the adequacy of the region's power supply for the coming summer, fall and winter. Operational strategies for the Columbia/Snake river hydropower system are a key component of managing through this year with the objectives of:

- Satisfying electricity demand through this spring and summer;
- Achieving reasonable summer flows for salmon migration;
- Not significantly worsening fall and winter reliability and the ability to meet Biological Opinion (BiOp) reservoir target elevations in 2002; and
- Limiting the impacts of wholesale power purchase costs on the region's economy and the financial condition of the region's utilities.

To assess the options available to the region, the Council has analyzed several alternatives for the operation of the power system over the coming year. The analysis was done in two stages. The first focused on this spring and summer for two water scenarios—1977 water and 1944 water. These years bracket the current runoff volume forecast for 2001. For each of these water years, several operating strategies were evaluated. They include: running the hydropower system to the Biological Opinion constraints for spill and flows; maintaining spill while drafting the system deeper to meet loads; and three strategies that involve significant reductions in spill combined with limited use of deeper drafts, with the objective of achieving BiOp reservoir elevations by the end of August. The analysis looked at such metrics as the amount of curtailment that could be experienced, the cost of purchased power to address any curtailment, end-of–August reservoir elevations, and spring and summer flows.

The second stage of the analysis focused on the operation of the system through the fall and winter with the starting elevation of the reservoirs in September being the primary variable. This analysis was done probabilistically with uncertainty about fall and winter water conditions, temperatures and forced outages of thermal units. The analysis looked at the probability and magnitude of load loss during the winter period and April 2002 reservoir elevations.

The conclusions drawn from this analysis are:

- Operating the hydropower system to the BiOp targets for spill and flows would lead to either significant curtailments and/or very large purchased power costs this summer.
- Operations this spring and summer that leave reservoirs at the end of August at elevations significantly below BiOp elevations expose the region to significantly increased probability of power supply inadequacy next winter. In addition, such operations would result in a significant probability that April 2002 reservoir elevations will be well below BiOp elevations, thereby reducing spring flows for salmon.
- The only alternatives we see that both avoid curtailments and/or large purchased power costs this summer AND return reservoirs to BiOp elevations by the end of August involve substantial reduction in spill and limited drafting of reservoirs beyond BiOp elevations. Reductions in spill can be restored by purchases, reductions in load and additional generation. Alternatives that significantly reduce spill have the additional advantage of reducing market prices this summer and bringing additional income into the region in the form of dollars, returned energy next fall and winter, or both.
- Decisions need to be made now, but they can be revisited periodically as the spring and summer unfold. The spill season begins in April. By that time, we will have relatively little additional information about how the rest of the spring and summer are going to unfold. From the power supply standpoint, a prudent approach would be to significantly reduce spring spill. If conditions improve through the spring, it may be possible to restore some spill. If, instead, we were to opt to maintain spill or reduce it only slightly in the spring and if conditions

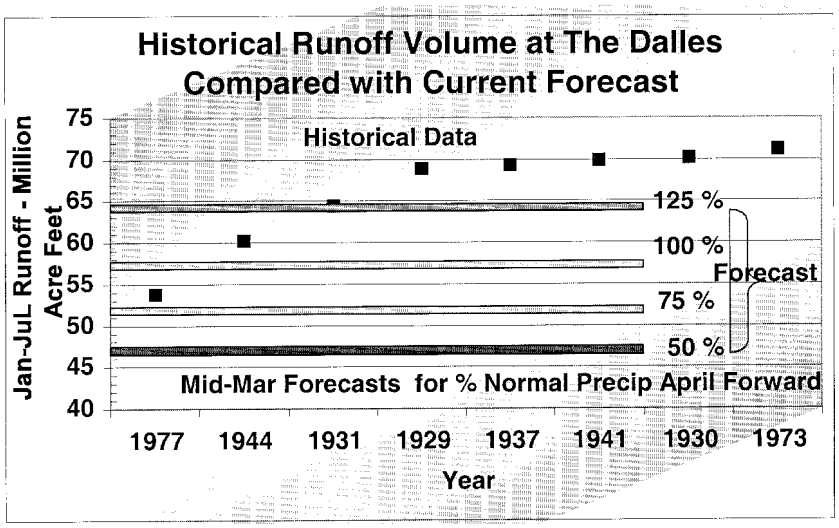
do not improve, that spill energy would be lost to the system and would necessitate more stringent and potentially very expensive measures later on.

- The potential for power supply problems this summer and next winter and the probable high cost of power call for continued and increased attention to implementing load reduction, conservation and new generation.

INTRODUCTION

The runoff forecast for 2001 continues to degrade. The January-through–July forecast released March 15th is 57.6 million acre feet (MAF) at The Dalles Dam.[1] The mid–March forecast for runoff volume at The Dalles compared with the eight lowest years in the 60-year historic record is shown in Figure 1. The most often quoted forecast assumes 75 percent of normal precipitation for the last two weeks of March and 100 percent of normal precipitation from April 1st on. However, alternative forecasts are made for higher and lower percentages of normal April–July precipitation. As Figure 1 shows, if the April through July precipitation is 75 percent of normal, the runoff volume would be less than the 1977 volume, the lowest on record. While National Weather Service personnel to whom we have talked do not believe April through July precipitation that is 50 percent of normal is very likely, the possibility of runoff as low or somewhat lower than 1977 is quite possible.

Figure 1



These conditions raise obvious concerns about whether the Northwest power system can meet loads through this summer and next winter and satisfy the other demands placed on it.

Objectives

In view of the very poor water conditions facing the region and the continuing power crisis in California, the Council has undertaken an analysis with the objective of identifying strategies that:

- Satisfy electricity demand through this spring and summer;
- Achieve reasonable spring and summer conditions for salmon migration, given the circumstances;
- Do not significantly worsen fall and winter reliability and the ability to meet Biological Opinion reservoir target elevations in 2002; and
- Limit the impacts of wholesale power purchase costs on the region's economy and the financial condition of the region's utilities.

[1] The April "early bird" forecast has come in at 55.7 MAF.

Tools

The tools that the region has at its disposal to meet these objectives are:

- Use of "emergency" hydro. Emergency hydro is defined as additional energy that can be generated by drafting reservoirs below elevations intended to increase the likelihood of meeting spring and summer BiOp flows for salmon. The risk in using emergency hydro is that we may take reservoirs so low that summer flows are affected and end-of–August elevations have a significant adverse effect on fall and winter reliability.
- Reducing spill. Spill is water that is passed over the dams, not passed through turbines. Consequently, spilled water produces no energy. Spill is an element of the BiOp and is also an element of the FERC-sanctioned agreements governing the operation of non-Federal projects on the Columbia. The risk in reducing spill is the possible impact on survival of in-river downstream juvenile migrants.[2]
- Purchase of imported power. To the extent that we can purchase power, potential deficits can be reduced or eliminated and water can be retained in the reservoirs. The availability and price of imports is problematic this year. Physically, there ought to be imports available in off-peak periods. However, this year the price may be prohibitive. The costs of purchased power work their way into retail rates with adverse impacts on the regional economy. In addition, Bonneville's financial position is particularly vulnerable this year. High purchase power costs could imperil Bonneville's ability to make its Treasury payment and maintain necessary operating reserves through the fall.
- Additional in-region "emergency generation." Several utilities in the region have or are in the process of installing emergency generation. These are typically groups of diesel fuel or natural gas-fired reciprocating engines—"Diesel Farms." Others have turned to small, single cycle gas turbines, some older used units, others new. In addition there is some ability to utilize existing industrial and large commercial backup generation. These are relatively small in utility terms, but can add up in aggregate. To the extent these units can be acquired and operated at costs less than the cost of purchased power, they can offset expensive purchases or use of the other alternatives. The downside is the potential air quality impacts associated with these typically comparatively high emissions units.
- Voluntary or purchased load reduction. This can take several forms. One is investment in traditional conservation—the more efficient use of electricity. This has the advantage of reducing electricity use while not impacting productivity or lifestyle. Certainly a lesson of the past year is that sustained investment in conservation is important. However, there is relatively little that can be implemented by this summer. The other approach is curtailment—reducing or eliminating some uses of electricity. This can be voluntary, such as elimination of unnecessary decorative lighting and signage; turning off lights and appliances when not is use, and so on. Or it can be purchased curtailment. The most prominent example of this has been the aluminum industry, where most plants are now being paid not to operate. The amount of the payment is less than the cost of the power to serve them. This approach has other applications as in irrigated agriculture and other industries.

ANALYTICAL APPROACH

In this analysis, the Council used its GENESYS model of the Northwest power system. That model is described in detail in the Council's March 2000 power supply adequacy study.[3] GENESYS treats the region as a whole, but does simulate the transmission constraints into the region and between the Eastern and Western parts of the Northwest. Individual utilities or control areas are not modeled. The region modeled included all of Montana, Oregon, Idaho, and Washington so that results could be directly compared with information from the Northwest Power Pool. Regional loads were reduced to account for the recent reductions in direct service industrial (DSI) load. It was assumed that there was approximately 500 megawatts of DSI load still operating. Further reductions in DSI load are possible. In addition, there are some additional industrial closures that may not be reflected in the analysis. The model also incorporates known "emergency" generation such as the "diesel farm" installations that several regional utilities have undertaken. The potential for imports from outside the region—British Columbia, California and the Desert

[2] Most smolts in the Snake River will be barged this year, but some remain in-river. There is no barging in the Columbia main stem upstream of McNary.

[3] Power Supply Adequacy

Southwest—is represented by seasonal supply curves that are estimated from available data and consultations with informed persons in the affected regions.

Stage 1 -- March through August 2001

The analysis was approached in two stages. The first concentrated on the March-through–August period. The analysis began with the reservoirs at their actual March 1st elevations. Typically in analyses of this sort, important variables like hydro conditions, temperatures and, therefore, electricity loads, and forced outages of power plants are treated probabilistically. Several hundred simulations or "games" are run where the water conditions, temperatures and forced outages are sampled according to their probability of occurrence. By analyzing the results of these hundreds of games we can estimate the probabilities of load-resource imbalances and meeting reservoir elevation and river flow targets. However, because there are so few years in the 60-year record of hydro conditions with runoff volumes like the current forecast and only one with a lower runoff, we have chosen to do scenario analysis using 1944 and 1977 water conditions. The analysis is limited to monthly energy analysis due to difficulties in modeling sub-daily operations with this year's reservoir and water conditions. Average temperatures and expected operation of thermal units were used.[4] The actual maintenance schedules of thermal generating units are now commercially sensitive information and not easily obtained. For this analysis, planned maintenance of thermal units was scheduled into May, June and early July as has historically been the case.

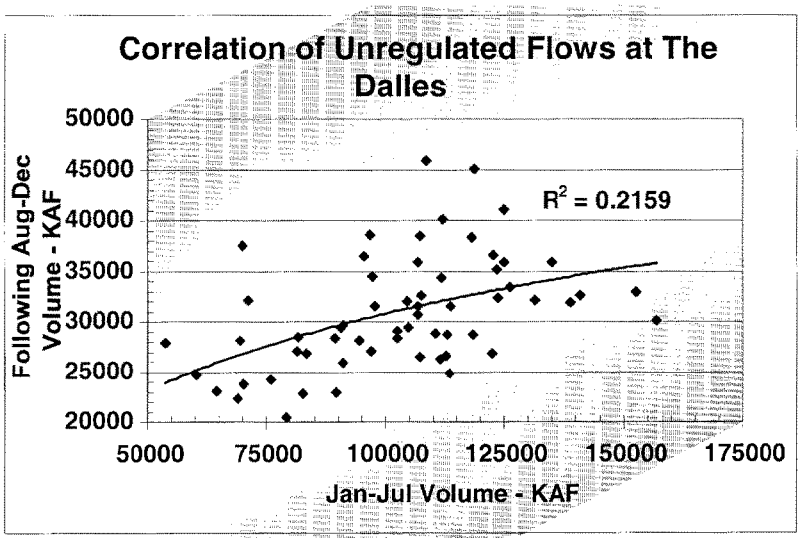
The first stage looked at various operating strategies for the spring and summer primarily involving emergency hydropower and reductions in spill. Purchases were not evaluated explicitly because of the uncertainty of the availability of purchases this spring and summer (California is experiencing rolling blackouts as this is being written, a time when peak loads in the state are approximately 60 percent of what can be expected this summer) and their expected extremely high cost. However, depending on availability, purchases could substitute for spill reduction or could be used to restore reservoir levels after emergency hydro operations. Council staff is attempting to get information regarding aggregate firm import commitments that Northwest utilities may have. The analysis will be updated if this information becomes available. The analysis focused on the level of potential curtailment, the effect on spring and summer flows, and the end-of–August reservoir elevations.

Stage 2 -- September 2001 through February 2002

The second stage of the analysis focused on the ability of the region to meet loads through the ensuing fall and winter for different reservoir elevations at the beginning of September. For this part of the analysis, a set of hydro conditions corresponding to the lower two thirds of the water years (runoff volumes less than 114 MAF) were used. This is because there appears to be a correlation, albeit very weak, between the January-through–July streamflow volumes and the volumes in the ensuing August-through–December period. This correlation is shown on Figure 2.

[4] The monthly output of thermal units was discounted by their forced outage rates.

Figure 2



The model was run in its full stochastic mode, i.e., multiple games with water conditions, temperatures and, therefore, loads, and forced outages on thermal units determined randomly. In addition, a limited amount of imports was assumed to be available during off-peak periods.

RESULTS

Stage 1 -- March through August 2001

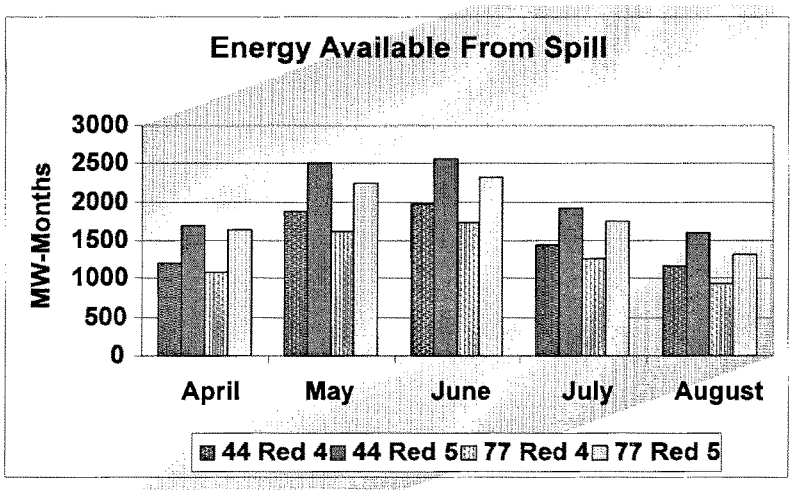
Operation of the system for the March-through–August period was analyzed for several different scenarios for 1944 and 1977 water conditions. For each year, a "Base Case" was run that corresponds to operation of the system according to the BiOp. In addition, a "Maximum Emergency Hydro" case was run that maintains spill and drafts reservoirs as necessary to meet load, using up to 10,000 megawatt-months of emergency hydro. Finally, three different spill reduction cases were run with a limited amount of emergency hydro (up to 1,000 megawatt-months) used as necessary to meet load while at the same time maintaining end-of–August reservoir contents very close to BiOp elevations (within 1 or 2 percent).

The spill reduction cases were:

- Spill reduction 4—No spill at Federal projects;
- Targeted spill—Morning and evening spill at John Day and Bonneville, no spill at other projects, Federal or non-Federal;
- Spill reduction 5—No spill at any projects.

The amount of energy involved in spill is quite large. Figure 3 shows the availability of spill energy across the spill season for the spill reduction 4 and 5 cases.

Figure 3



"Red 4" = Spill reduction which eliminates spill at all federal projects
"Red 5"= No spill at any projects, federal and non-federal

SUMMER SUMMARY

For each of these cases several measures were evaluated:

- The total curtailment across the period;
- The cost of imports IF the curtailment could be offset by purchases, assuming a $250/MW-hr price;
- The approximate amount of spill energy used;
- The August 31 system content below BiOp elevations; and
- The amount of "retained" energy. The retained energy is the amount of spill energy available over and above that needed to meet load and restore system contents to BiOp elevations at the end of August.

This information is summarized in Table 1. Also shown is a result from the second stage of the analysis: the probability of unserved demand at some level across the 2001–2002 winter months. This will be discussed in a later section.

Several things are readily apparent from Table 1. The first is that operating the system to the BiOp to spill and meet flow targets is not an option. To do so would

Table 1 -- Summary

	Summer					Winter
Alternatives	Total Curtailment (mw-mo)	Cost of Imports* to Balance Loads ($Millions)	Apprx Spill Energy Used (mw-mo)	Aug 31 Content Below BiOp (mw-mo)	"Retained" Energy (mw-mo)	Winter Season (Dec-Feb) Loss of Load Probability
Base Case BiOp(1944)	5606	$1,009	0	0	0	20%
Max Emerg (1944)	0	$0	0	5872 (-20.7%)	0	39%
Lim Emerg+ Red 4 (1944)	177	$32	5186	211 (-0.7%)	3422	20%
Lim Emerg + Target (1944)	0	$0	5237	369 (-1.3%)	4349	20%
Lim Emerg + Red 5 (1944)	0	$0	5567	39 (-0.1%)	5569	20%
Base Case BiOp(1977)	7993	$1,439	0	0	0	20%
Max Emerg (1977)	1663	$299	0	7976 (-27.9%)	0	45%
Lim Emerg + Red 4 (1977)	1289	$232	6345	127 (-1.4%)	432	20%
Lim Emerg + Target (1977)	441	$79	7401	72 (-0.3%)	789	20%
Lim Emerg + Red 5 (1977)	89	$16	7486	402 (-0.4%)	1652	20%

"Max Emerg" = Maximum use of emergency hydro up to 10,000 mw-months -- drafting reservoirs below BiOp elevations
"Lim Emerg" = Limited use of emergy hydro up to 1,000 mw-months
"Red 4" = Spill reduction which eliminates spill at all federal projects
"Target"= Targeted spill reduction with morning and evening spill at Bonneville and John Day, no spill at other projects, federal and non federal
"Red 5"= No spill at any projects, federal and non-federal
* Imports priced at an average of $250 per megawatt-hour

leave very large unserved load (curtailments) with either 1944 or 1977 water. If it were possible to purchase imported energy to meet those deficits, the cost could easily exceed $1 billion, and it is not at all clear that purchases of this magnitude would be available.

A second observation is that by using maximum emergency hydro—drafting the reservoirs deeper—while maintaining spill could, with 1944 water, avoid summer curtailments. With 1977 water, there would be some remaining curtailment, but of a magnitude that might be managed with additional load reduction and some purchases. However, in this instance the curtailment occurs in August when imports might be especially hard to acquire. In both cases, the August 31st reservoir content is well below BiOp elevations. This has implications for reliability later in the fall and winter, as indicated by the higher loss-of-load-probability in the last column of Table 1. This question is examined in Stage 2 of the analysis.

The final observation is that with the combination of significant reductions in spill and some use of emergency hydro, it is possible to effectively eliminate curtailment in the 1944 water case and return reservoirs to their BiOp elevations by the end of August. In addition, there is an appreciable amount of retained energy in the system. For 1977 water, the combination of significantly reduced spill and limited use of emergency hydro does not eliminate curtailments but reduces them to much more manageable levels while returning reservoirs to BiOp elevations. The curtailments largely occur in May and June, coinciding with the period during which most planned maintenance on thermal units is assumed to be occurring. If water conditions this year approach 1977 conditions, the region could need to look to further steps to avoid curtailment. As in the 1944 water case, there is some energy retained in the system, although much less. We have looked at additional scenarios that do not reduce spill quite as much and compensate by using additional emergency hydro. However, unless we are willing to accept August 31 reservoir contents that are well below BiOp, the amount of reduction in spill has to be significant.

This retained energy could be used to restore some spill, fill reservoirs somewhat higher at the end of the summer or to generate additional power.[5] If this retained energy were used to generate electricity it could generate additional revenue to offset high power prices. Alternatively, it might be exchanged with California on an X Megawatt-hours-for-one basis, with much of the returned energy coming the following winter when it could help address potential power supply problems. In either event, some of the benefit could be set aside to fund fish mitigation measures that might offset some or all of the effects of a one-time reduction in spill.

It should also be recognized that introducing the amount of additional energy associated with spill into the market will have the effect of reducing market prices. To analyze the potential effect, two short-term price studies were done using the AURORA model. One run used the hydro generation associated with full spill, the other used the hydro generation associated with no spill, both for 1944 water. The average market price differential between the two runs was $56/megawatt-hour. This would reduce the revenues that Bonneville and other Northwest utilities might receive from reducing spill and selling additional energy. But purchasers of power on markets throughout the West would benefit from lower prices.[6] If we assume that 10 percent of the electricity consumed during the April-through–August period is secured through short-term markets as opposed to long-term contracts, the value of this reduction in price would be $1.2 billion.

SPRING AND SUMMER FLOWS

Also of concern is the effect of the operational strategies on spring and summer flows. Figures 4 and 5 show the percent change in flows from the BiOp operation for spring and summer at McNary and Lower Granite for 1944 and 1977 water respectively.

[5] The degree to which this water can be used to increase reservoir levels is limited because of limited inflows to reservoirs high in the system late in the summer.

[6] Those like Bonneville who could have spill energy to sell would still have increased revenues, just not as great as current market prices might suggest.

Figure 4

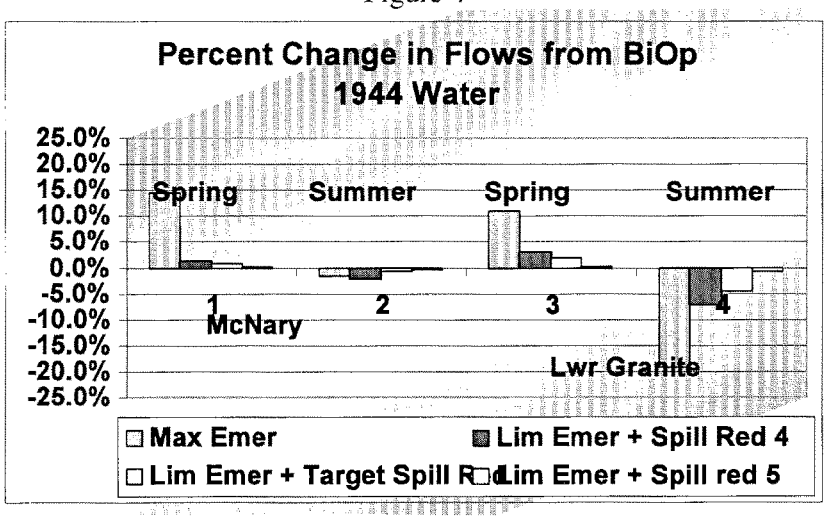
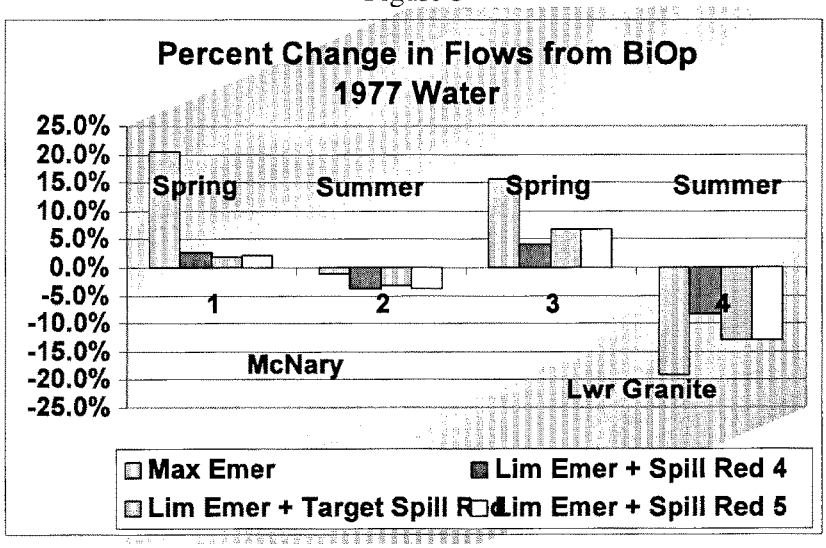


Figure 5



Spring flows are generally increased from BiOp levels for the operating strategies modeled because each involves some emergency drafting. Summer is a different story. The system is trying to refill reservoirs that provided emergency energy earlier in the summer, thus reducing summer flows. This is particularly so for the "maximum emergency hydro" example. Generally, summer flows in the Snake are most at risk. In the reduced spill cases, some of the summer flows could be restored by generating with the retained spill energy or by spilling.

Stage 2 -- September 2001 through February 2002

This part of the analysis was focused on reliability concerns through the fall and coming winter. Of particular interest was to assess the effect of lower end-of–August reservoir elevations on the ability to meet load. Three cases were examined:

- Reservoirs at BiOp elevations at the end of August;

- Reservoirs starting at the elevations corresponding to the use of emergency hydro only for 1944 water conditions (79 percent of BiOp elevation); and,
- Reservoirs starting at the elevations corresponding to the use of emergency hydro only for 1977 water conditions (72 percent of BiOp elevation).

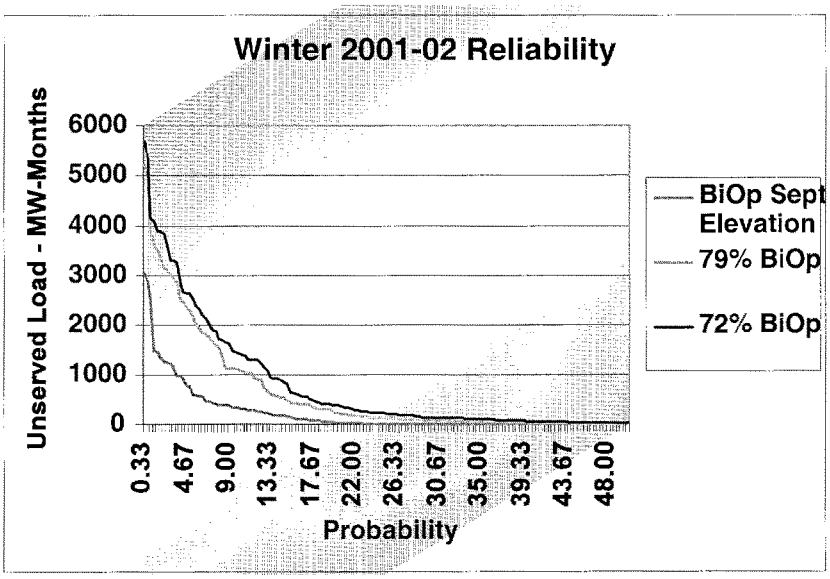
It should be pointed out that the last two cases are essentially surrogates for starting the reservoirs at elevations significantly below BiOp levels. For example, additional drafting for higher summer flows could have the same effect.

As noted earlier, this part of the analysis was carried out probabilistically using random draws of water conditions, forced outages of thermal units and temperatures which, in turn, are used to determine loads. A reduced set of water years was used to reflect the fact that there appears to be a weak correlation between the unregulated volumes in the fall and winter and the unregulated volumes in the preceding eight months. For this analysis, it was assumed that a very limited amount of imports was available beginning in October, primarily during off-peak periods. This reflects the experience of this past winter. We would hope that with additional generation scheduled to come online in the Southwest this summer, more imports might be available at an affordable price. Faced with curtailment, the simulation uses emergency hydro up to a total of 10,000 megawatt-months, limited by physical and operational constraints. In the absence of imports, the emergency hydro is restored to the extent possible by running in-region thermal units harder and purchasing imports.

WINTER 2001–2002 POWER SYSTEM ADEQUACY

The first question was the probability of curtailment occuring at some time during the winter season, the months of December 2001 and January and February 2002. This is shown in Figure 6.

Figure 6



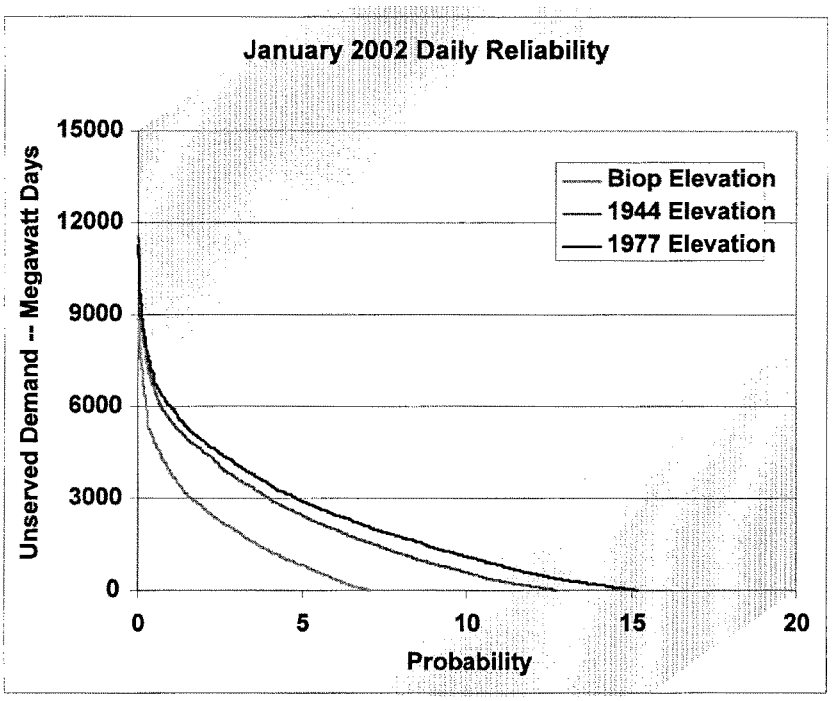
When starting at BiOp reservoir elevations, in 20 percent of the 300 winters modeled, there was some level of unserved load, with the maxiumum seasonal unserved load being over 3,000 Megawatt-months. This is not indicative of a reliable system and is consistent with the results of the Council's March 2000 study, which found a 24 percent probability of unserved load in 2003. In this year's analysis we have lower loads and some additional resources, both of which should improve reliability. However, this is conteracted by also having reduced import capability and lower average hydro capability because we are drawing from the lower two-thirds of the set of water years.

The amount of power needed to bring the loss of load probability down to 5 percent was found to be approximately 2,500 megawatts. This could achieved through of some combination of additional generation, imports, conservation and/or voluntary or purchased load reduction.

For the lower reservoir starting elevations, 39 to 45 percent of the winters experience some unserved load with average unserved loads of 800–900 Megawatt–Months in those winters and maximums reaching over 5000 Megawatt-months.

January is the worst of the winter months. To get a better sense of the magnitude of shortfalls that could be experienced, we looked at the average daily unserved load for that month. This is shown in Figure 7.

Figure 7

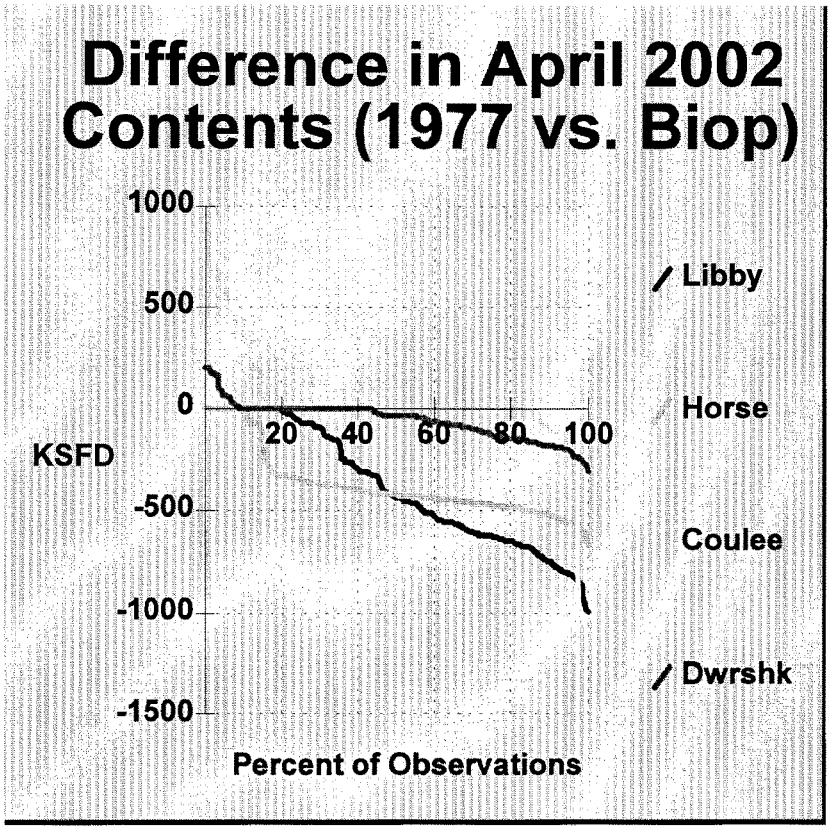


For the case with reservoirs starting at BiOp elevations, approximately 7 percent of the 9,300 January days simulated (300 games times 31 days), had some level of unserved load, with the maximum daily average reaching about 8,000 Megawatt-days. Starting the reservoirs at the lower elevations increases the percentage of days to 13 and 15 percent with the maximums reaching 10,000 to 11,000 Megawatts-days.

SPRING 2002 RESERVOIR ELEVATIONS

The other effect of lower reservoir starting elevations is on April 2002 reservoir elevations. These elevations are established to ensure being able to provide spring flows for downstream salmon and steelhead migrants. In the BiOp, approximately 12 MAF of water by April 15th is targeted for providing spring flows. On average, starting reservoirs in the fall at the lower elevations results in approximately 2 MAF less water in storage by April than when the reservoirs begin the fall at BiOp elevations. In the worst case with the lower starting reservoir elevations, April storage volumes are over 6 MAF lower. The duration curves of reservoir content (shown as difference from BiOp contents) is shown on Figure 8 for the case where reservoirs are started in September at their low 1977 water elevations.

Figure 8



CONCLUSIONS

Several conclusions can be drawn from the results of this analysis.:

- Operating the hydropower system to the BiOp targets for spill and flows would lead to either significant curtailments and/or very large purchased power costs this summer.
- Operations this spring and summer that leave reservoirs at the end of August at elevations significantly below BiOp elevations expose the region to significantly increased probability of power supply adequacy problems next winter. In addition, such operations would result in a significant probability that April 2002 reservoir elevations will be well below BiOp elevations, thereby reducing spring flows for salmon.
- The only alternatives we see that both avoid curtailments and/or large purchased power costs AND return reservoirs to BiOp elevations by the end of August involve substantial reduction in spill this spring and summer and limited drafting of reservoirs beyond BiOp elevations. Reductions in spill can be restored by purchases, reductions in load and additional generation. Alternatives that significantly reduce spill have the additional advantage of reducing market prices this summer and bringing additional income into the region, either in the form of dollars or returned energy next fall and winter.
- Decisions need to be made now, but they can be revisited periodically as the spring and summer unfold. The spill season begins in April. By that time, we will have relatively little additional information about how the rest of the spring and summer are going to unfold. From the power standpoint, a prudent ap-

proach would be to significantly reduce spring spill. If conditions improve through the spring, it may be possible to restore spill. If, instead, we were to opt to maintain spill or reduce it only slightly in the spring and conditions do not improve, that spill energy would be lost to the system and would necessitate more stringent and potentially very costly measures later on.

- The potential for power supply problems this summer and next winter and the probable high cost of power call for continued and increased attention to implementing load reduction, conservation and new generation.

ATTACHMENT C

MARCH 30, 2001

DRAFT

ISSUE PAPER:

ANALYSIS OF 2001 FEDERAL COLUMBIA RIVER POWER SYSTEM OPERATIONS ON FISH SURVIVAL

INTRODUCTION

The Columbia River Basin is now facing a severe drought. The current forecasts predict that this will be at least the second worst water year in the 72-year historical record, and there is a possibility that this year may in fact set a new record for low flow conditions.

The poor water conditions, a growing BPA financial problem, and looming energy concerns are causing the region to look for alternatives to meet anticipated energy needs. Changes to the operations of the Federal Columbia River Power System (FCRPS) will most likely be needed to optimize power production and help offset the growing Northwest and West Coast power crisis.

Reductions in spill designated for juvenile fish passage have been considered as one way to help meet energy demand. While spill reductions may help ease the difficult power situation, it is unclear how these reductions may affect juvenile fish survival. To help answer this question, Council staff examined the possible relative biological effects of various spill and transportation alternatives on Columbia basin fish survivals. While there are many unlisted hatchery and naturally spawning populations in the Columbia Basin, the Council analysis focuses solely on ESA-listed stocks.

The 2000 Federal Columbia River Power System Biological Opinion (2000 Biological Opinion) uses a combination of strategies to help juvenile salmon and steelhead migrating out to the ocean pass through or around each hydroelectric dam. There are four possible routes: (1) through a juvenile bypass system, which intercepts fish with screens and routes them through a specially designed passage in the dam; (2) by opening the spill gates, which routes the fish over the spillway but decreases the water available for generating electric power; (3) through the turbines, which is not a preferred route due to reduced survival; and (4) by intercepting fish and transporting them in barges to a release point below the hydroelectric system.

This Issue Paper focuses on three questions:

- Given full implementation the 2000 Biological Opinion for 2001 water conditions, how will additional spill reductions at FCRPS dams change the total system survival of migrating ESA-listed juveniles?
- How will juvenile transportation at McNary Dam affect the survival of the Upper Columbia ESA-listed stocks?
- How will adult returns be affected by changes in spill and fish transportation operations?

The analysis that follows is a preliminary staff analysis of these questions. The Council seeks comment on this analysis and will consider these issues further at its April 24, 25, and 26 meeting in Spokane, Washington. Those wishing to comment may submit written comments to Mark Walker, Director, Public Affairs Division, Northwest Power Planning Council, 851 SW Sixth Avenue, Suite 1100, Portland, OR 97204 or mwalker@nwppc.org through April 20, 2001.

SUMMARY OF RESULTS

In analysis included in the 2000 Biological Opinion, the National Marine Fisheries Service (NMFS) used its spreadsheet model to project the survival of salmon passing through the hydrosystem. This model, known as SIMPAS, is used in this analysis to estimate the relative effects of various spill and transportation alternatives on juvenile salmon survival.

The following are the results of this analysis.

When compared to full implementation of the 2000 Biological Opinion under 2001 water conditions, spill reductions at FCRPS dams:

- Have little to no effect on the total system survival of Snake River spring/summer chinook, Snake River steelhead or Snake River fall chinook.
- Decrease total system survival for Upper Columbia spring chinook, Upper Columbia steelhead and Middle Columbia steelhead to the highest extent compared to other ESU's. These stocks are not transported and pass through several dams.
- Have less effect on the total system survival for Lower Columbia chinook and Lower Columbia steelhead because 1) most of the these listed populations are geographically situated below Bonneville Dam and 2) the Lower Columbia chinook and steelhead only pass one FCRPS dam (Bonneville Dam).

When compared to full implementation of the 2000 Biological Opinion under 2001 water conditions, full transportation at McNary Dam with no spill at FCRPS dams:

- Increases Upper Columbia spring chinook total system survival under all alternatives.
- Increases Upper Columbia steelhead total system survival under most conditions.

For the alternatives examined, estimated adult losses for listed fish range from:

- Zero adults lost for Snake River steelhead (0.0 percent of total return) to
- 53 to 2,535 Upper Columbia spring chinook adults lost with no transport at McNary Dam (12.7 percent of total return).

CAVEATS

Staff believes that this analysis focuses on the attributes most important to this year's decision. While not all the relevant factors have been measured or identified, this analysis focuses on the relative effect of various alternatives. Parameters that are assumed to be the same among various alternatives effectively "cancel out" in a relative analysis. Nevertheless, the reader should be aware that:

(1) This analysis focuses primarily on juvenile fish survival through the dams. It does not include any consideration of the potential effect of migration delays resulting from fish holding at dams before entering the juvenile bypass system. While this behavior has been observed in some circumstances, the Council is not aware of any empirical measurements demonstrating the effect this behavior has on the survival of juvenile fish to maturity.

(2) This analysis also does not include any consideration of the benefit to adult fish migration resulting from reduced spill. While it has been observed that the number of adult fish entering the ladders at a dam often increases when spill is terminated, the Council is not aware of any empirical measurements demonstrating the effect of this behavior on the survival or fitness of adult fish migrating upriver.

(3) This analysis does not consider the effects of reducing spill at the non-Federal dams located in the mid–Columbia region. The SIMPAS model does not include information on the survival of juvenile fish through those dams.

(4) The survival estimates shown in this issue paper are survivals through the hydrosystem. These estimates include all mortalities that occur to juvenile fish during this phase of their migration, even mortalities that would occur naturally in the absence of the hydrosystem. No attempt has been made in these estimates to differentiate mortalities that result from the hydrosystem from mortalities that result from other sources.

SUMMARY OF RECOMMENDATIONS

This issue paper does not attempt to weigh the value of additional electrical power generation versus the value of increasing the survival of juvenile fish through spill. However, in the event that it is determined that spill should be decreased, the staff offers the following recommendations for the 2001 juvenile migration season:

- Stop spill at Ice Harbor and McNary dams.
- Maximize transportation at all FCRPS collector dams, including McNary.
- Utilize surface sluiceway spill at dams to pass juveniles wherever possible and beneficial.
- If water is available for spill, focus spill to optimize benefits to Middle Columbia steelhead and to a lesser extent remaining inriver Upper Columbia spring chinook and steelhead.
- Although major changes in the fish passage structures at the dams are unlikely to be accomplished this year, the U.S. Army Corps of Engineers should immediately accelerate development of surface-oriented bypass systems which, in ef-

fect, allow juvenile fish to have the advantages of spill without the large impact on power generation.

SIMULATED PASSAGE MODEL (SIMPAS)

Council staff used the SIMPAS model to analyze the relative effects of various spill and transportation alternatives on fish survival in the Snake River and upper Columbia River basins.[7] SIMPAS is a spreadsheet model developed by the NMFS Hydro Program staff that uses empirical fish passage data to estimate relative juvenile survival through the hydrosystem for various alternatives. The model was used by the Federal Biological Effects Team to help develop the 2000 Biological Opinion and is currently used to analyze the relative consequences of hydropower operational changes on the survival of listed stocks.

Question 1. Given full implementation the 2000 Biological Opinion for 2001 water conditions, how will additional spill reductions at FCRPS dams change the total system survival of migrating ESA-listed juveniles?

To address Question 1 the staff analyzed four different spill alternatives:

Base Case -- Full implementation of the 2000 Biological Opinion at all Federal dams based on projected 2001 water conditions. This includes:

- No spill at Lower Granite, Little Goose and Lower Monumental dams
- Full transport of juveniles at Snake River collector dams
- No summer spill at McNary Dam with full transportation

Alternative 1 -- Base Case plus:

- No spill at Ice Harbor Dam
- No spill at McNary Dam

Alternative 2 -- Alternative 1 plus:

- 24 hour spill reduction to 20percent of total flow at The Dalles Dam.
- 24 hour spill reduction at Bonneville Dam to 50 kcfs.

No Spill Alternative

- No spill at FPRPS dams

Average of Low Flows -- Projected 2001 spring and summer river flows were estimated using a weighted average of the 8 lowest water years (1929, 1930, 1931, 1937, 1941, 1944, 1973 and 1977) of a 61-year historical record. In the event that 2001 is even lower than these averages, it is possible that inriver survival may decline further and thus the relative benefit of transporting fish, where possible, may increase. Table 1 shows average river flows used in the analysis.

Table 1. Average flows used in the analysis.

	Columbia River @ McNary	Snake River @ Lower Granite
Spring flow	129 kcfs	53 kcfs
Summer flow	127 kcfs	29 kcfs

Delayed mortality of transported juveniles- The 2000 Biological Opinion estimates differential post–Bonneville Dam mortality (D value) of transported fish. The D value is defined as the ratio of the post–Bonneville survival of transported fish to the post–Bonneville survival of fish that remain inriver. If the D value is greater than 1.0 then transported fish have a post–Bonneville survival rate that is higher than inriver fish. If the D value is less than 1.0, then transported fish have a post–Bonneville survival rate that is lower than inriver fish. A D value of less than 1.0 may be caused by a variety of causes including the delayed effects of the transportation and collection process.

To more accurately reflect the total system survival and the delayed mortality that may occur after transport, the Council staff adjusted transported fish survivals using the D values contained in the 2000 Biological Opinion. The D values used are summarized in Table 2.

[7] A description of SIMPAS and model documentation can be found in Appendix D of the 2000 Biological Opinion.

Table 2. D values used in the analysis.[8]

	Snake River		Upper Columbia	
Species	Low	High	Low	High
Spring Chinook	0.63	0.73	0.63	1.0
Steelhead	0.52	0.58	0.52	1.0
Fall Chinook	0.24	0.24	-	-

RESULTS

Using SIMPAS, the Council staff estimated total system survival to below Bonneville Dam for each ESA stock using the various alternatives. Staff chose to use total system survival over inriver survival because it better reflects the effects of spill reductions given the number of stocks being transported. Total system survival to below Bonneville Dam is calculated by summing the percent survival of transported fish with the percent survival of fish remaining inriver. In the spill analysis, only Snake River fish are transported. Where fish are not transported, inriver survival equals total system survival.

Table 3 summarizes total system survival to below Bonneville Dam for the various stocks and alternatives. Starting with 1,000 juveniles, the table shows how many fish survive to below Bonneville Dam. Total system survivals for Snake River stocks represent survival from Lower Granite pool to below Bonneville Dam. System survival for Upper Columbia stocks represent survivals from McNary pool to below Bonneville Dam. Middle Columbia survivals represent survival from John Day pool to below Bonneville. Finally, Lower Columbia survivals indicate survival from Bonneville pool to below Bonneville Dam.

Table 3. Total system survival of 1,000 juveniles to below Bonneville Dam under base case, alternatives 1 & 2 and no spill using D values from Table 2. ( ) indicates a reduction in survival from the base case.

Listed Stock	Base Case Biological Opinion	Alternative 1 No Spill @ IHR & MCN	Alternative 2 Reduce Spill @ TDA & BON	No Spill
Snake River Spring/Summer Chinook LGR-BON	558 to 645	558 to 645 (0)	557 to 644 (1)	557 to 644 (1)
Snake River Steelhead LGR-BON	455 to 508	455 to 508 (0)	455 to 508 (0)	455 to 508 (0)
Snake River Fall Chinook LGR-BON	111	111 (0)	110 (1)	110 (1)
Upper Columbia Spring Chinook MCN-BON	469	467 (2)	451 (18)	416 (53)
Upper Columbia Steelhead MCN-BON	531	529 (2)	512 (19)	475 (56)
Middle Columbia Steelhead JDA-BON	602	602 (0)	582 (20)	540 (62)
Lower Columbia Chinook BON	844	844 (0)	834 (10)	820 (24)
Lower Columbia Steelhead BON	868	868 (0)	858 (10)	844 (24)

To understand and encompass the range of effects that reducing spill has on total system survival, the Council staff compared the Base Case to the No Spill alternative. Table 4 shows the change in number of juveniles surviving to below Bonneville Dam.

Table 4. Comparison of total system survival estimates. Starting with 1000 juveniles, number of juveniles surviving to below Bonneville Dam: Base Case vs. No Spill

	No. of Juveniles Base Case Biological Opinion	No. of Juveniles No Spill	No. of Juveniles Loss	percent Change from Base Case
Snake River Spr/Sum Chinook LGR-BON	558 to 645	557 to 644	-1	-0.2
Snake River Steelhead LGR-BON	455 to 508	455 to 508	0	0.0
Snake River Fall Chinook LGR-BON	111	110	-1	-1.0
Upper Columbia Spring Chinook MCN-BON	469	416	-53	-11.3
Upper Columbia Steelhead MCN-BON	531	475	-56	-10.5
Middle Columbia Steelhead JDA-BON	602	540	-62	-10.3
Lower Columbia Chinook BON	844	820	-24	-2.8
Lower Columbia Steelhead BON	868	844	-24	-2.8

RESULTS

- Stopping spill at Ice Harbor and McNary dams has little effect on the total system survival of any listed stock. The only stocks that are slightly affected are the Upper Columbia spring chinook and steelhead, which have a 0.4 percent decrease in survival.
- Because most Snake River listed stocks are transported, decreasing or eliminating spill at FCRPS dams has little to no effect on Snake River stocks. Total system survival of Snake River spring/summer chinook decreases by 0.2 per-

cent, Snake River fall chinook decrease by 1.0 percent, and there is no decrease in Snake River steelhead.

- Lower Columbia chinook and steelhead survivals are less affected by eliminating spill at all dams (decreases of 2.8 percent for chinook and 2.8 percent for steelhead) because these stocks only pass one hydro project, Bonneville Dam.[8]
- Elimination of spill at all dams has the greatest impact on the survivals of Upper Columbia spring chinook and steelhead (decreases of 11.3 percent and 10.5 percent respectively) and Middle Columbia steelhead (a decrease of 10.3 percent). These stocks are not transported and pass through several dams.

Question 2. How will juvenile transportation at McNary Dam affect the survival of the Upper Columbia ESA-listed stocks?

Upper Columbia spring chinook and steelhead survivals are affected the most by eliminating spill at the lower river FCRPS dams. Because McNary Dam has fish transport facilities, a possible way to increase Upper Columbia fish survivals is to collect juveniles at McNary and transport them to below Bonneville Dam. To help determine the usefulness of this approach, staff looked at total system survival from McNary pool to below Bonneville Dam for the base case 2000 Biological Opinion alternative and the no spill alternative with full transport at McNary Dam. High and low transportation effects (D values) were used from Table 2 to estimate total system survival. Table 5 summarizes the findings.

Table 5. Comparison of total system survival. Starting with 1,000 juveniles, number of juveniles surviving to below Bonneville Dam: Base Case vs. No Spill and full transport at McNary Dam.

Listed Stock	No. of Juveniles Base Case Biological Opinion	No. of Juveniles No Spill and Transport at MCN	No. of Juveniles Loss or Gain	% Change from Base Case
Upper Columbia Spring Chinook MCN-BON	469	518 to 783	+49 to +314	+10.4 to +67.0
Upper Columbia Steelhead MCN-BON	531	458 to 837	-73 to +312	-13.7 to +58.8

RESULTS

- Under full transportation at McNary Dam, total system survival for Upper Columbia spring chinook increases using both low and high D values. Increases in total system survival range from 10.4 percent to 67.0 percent.
- Transportation at McNary appears to benefit Upper Columbia steelhead under most but not all conditions. Transportation at McNary does not benefit steelhead for lower D values. Total system survival changes for Upper Columbia steelhead range from "13.7 percent to 58.8 percent.

Question 3. How will adult returns be affected by changes in spill and fish transportation operations?

Council staff estimated the number of adults lost or gained from the changes in operations by listed stock. The alternatives studied assumed no transportation and full transportation at McNary Dam under spill and no spill conditions. High and low D values from Table 2 were used for transportation benefits. The number of juveniles arriving at the various dams was obtained from the 2001 NMFS juvenile out-

[8] It should also be noted that because most of the Lower Columbia ESUs are geographically located below Bonneville Dam, fewer Lower Columbia listed fish are affected by dam passage. Furthermore, NMFS has not determined which, if any, Lower Columbia chinook or steelhead stocks that are found above Bonneville Dam qualify as ESA-listed populations. The 2000 Biological Opinion states that causes for the decline of these two ESUs are primarily related to habitat and hatchery impacts.

migration memo.[9] A summary of the number of listed juveniles arriving at various locations is shown in Table 6.

Table 6. Number of ESA-listed stocks arriving at various locations.

Listed Stock (Starting Reservoir)	Number of Outmigrating Juveniles Arriving at Dam
Snake River Spr/Sum Chinook (LGN)	1,107,897
Snake River Steelhead (LGN)	850,853
Snake River Fall Chinook (LGN)	937,627
Upper Columbia Spring Chinook (MCN)	2,391,087
Upper Columbia Steelhead (MCN)	701,687
Middle Columbia Steelhead (JDA)	379,264
Lower Columbia Chinook (BON)	352,186
Lower Columbia Steelhead (BON)	34,000

The adult estimates were calculated by multiplying the number of juveniles lost or gained by an estimated smolt to adult ratio (SAR) for each stock. A general range of SARs was estimated by taking upriver SARs contained in the April 2000 NMFS white paper on transportation[10] and back calculating adult survival to below Bonneville Dam. Tables 7 through 9 include the range of SARs used and summarize the results.

[9] Memo from Michael Schiewe to Donald Knowles, "Estimation of Percentages for Listed Pacific Salmon and Steelhead Smolts Arriving at Various Locations in the Columbia River Basin in 2001." March 22, 2001.

[10] NMFS. "Summary of Research related to Transportation of Juvenile Anadromous Salmonids Around Snake and Columbia River Dams." April 2000.

Table 7. Number of adults lost or gained based on NMFS 2001 outmigration estimates. Base case vs. no spill alternative; no transportation at McNary Dam. ( ) indicates a reduction in survival from the base case.

Listed Stock	No. of Adults (Loss)/Gain		Total No. of Returning Adults		Percent Loss/Gain
	#Adults Low SAR S. Chin 0.2% Sthd. 0.3% F. Chin. 0.5%	#Adults High SAR S. Chin. 2.0% Sthd. 3.0% F. Chin. 5.0%	#Adults Low SAR S. Chin 0.2% Sthd. 0.3% F. Chin. 0.5%	#Adults High SAR S. Chin. 2.0% Sthd. 3.0% F. Chin. 5.0%	
Snake River Spr/Sum Chinook	(2)	(22)	1,279 to 1,427	12,785 to 14,270	-0.2%
Snake River Steelhead	-	-	1,161 to 1,297	11,610 to 12,967	0.0%
Snake River Fall Chinook	(5)	(47)	516	5,157	-0.9%
Upper Columbia Spring Chinook	(253)	(2,535)	1,989	19,894	-12.7%
Upper Columbia Steelhead	(118)	(1,179)	1,000	9,999	-11.8%
Middle Columbia Steelhead	(71)	(705)	614	6,144	-11.5%
Lower Columbia Chinook	(17)	(169)	578	5,776	-2.9%
Lower Columbia Steelhead	(2)	(24)	86	861	-2.8%

Table 8. Number of adults lost or gained based on NMFS 2001 outmigration estimates. Base case vs. no spill alternative; full transport at McNary Dam with low transportation survival (low D values). ( ) indicates a reduction in survival from the base case.

Listed Stock	No. of Adults (Loss)/Gain		Total No. of Returning Adults		Percent Loss/Gain
	#Adults Low SAR S. Chin 0.2% Sthd. 0.3% F. Chin. 0.5%	#Adults High SAR S. Chin. 2.0% Sthd. 3.0% F. Chin. 5.0%	#Adults Low SAR S. Chin 0.2% Sthd. 0.3% F. Chin. 0.5%	#Adults High SAR S. Chin. 2.0% Sthd. 3.0% F. Chin. 5.0%	
Snake River Spr/Sum Chinook	(2)	(22)	1,279	12,785	-0.2%
Snake River Steelhead	-	-	1,161	11,614	0.0%
Snake River Fall Chinook	(5)	(47)	516	5,157	-0.9%
Upper Columbia Spring Chinook	172	1,722	2,477	24,772	6.9%
Upper Columbia Steelhead	(36)	(358)	964	9,641	-3.7%
Middle Columbia Steelhead	(71)	(705)	614	6,144	-11.5%
Lower Columbia Chinook	(17)	(169)	578	5,776	-2.9%
Lower Columbia Steelhead	(2)	(24)	86	861	-2.8%

Table 9. Number of adults lost or gained based on NMFS 2001 outmigration estimates. Base case vs. no spill alternative; full transport at McNary Dam with high transportation survival (high D values). ( ) indicates a reduction in survival from the base case.

Listed Stock	No. of Adults (Loss)/Gain		Total No. of Returning Adults		Percent Loss/Gain
	#Adults Low SAR S. Chin 0.2% Sthd. 0.3% F. Chin. 0.5%	#Adults High SAR S. Chin. 2.0% Sthd. 3.0% F. Chin. 5.0%	#Adults Low SAR S. Chin 0.2% Sthd. 0.3% F. Chin. 0.5%	#Adults High SAR S. Chin. 2.0% Sthd. 3.0% F. Chin. 5.0%	
Snake River Spr/Sum Chinook	(2)	(22)	1,427	14,270	-0.2%
Snake River Steelhead	-	-	1,297	12,967	0.0%
Snake River Fall Chinook	(5)	(47)	516	5,157	-0.9%
Upper Columbia Spring Chinook	1,439	14,394	3,744	37,444	38.4%
Upper Columbia Steelhead	661	6,610	1,764	17,640	37.5%
Middle Columbia Steelhead	(71)	(705)	614	6,144	-11.5%
Lower Columbia Chinook	(17)	(169)	578	5,776	-2.9%
Lower Columbia Steelhead	(2)	(24)	86	861	-2.8%

RESULTS

Under the given assumptions, when comparing the surviving number of adults under base case 2000 Biological Opinion operations to the no spill alternative:

- For all transportation and spill scenarios, very few adults are lost for Snake River stocks. A range of only two to 22 spring chinook, zero steelhead and five to 47 fall chinook adults are estimated to be lost. The number of adults lost are 0.2 percent, 0.0 percent and 0.9 percent respectively of the total number of surviving adults.
- For all transportation and spill scenarios, Middle Columbia steelhead may lose as many as 705 adults or 11.5 percent the total number of surviving adults.
- Upper Columbia spring chinook with no transportation at McNary lose as many as 2,535 adults or 12.7 percent of the total returning adults. With transportation at McNary, there is actually an increase of up to 1,722 (6.9 percent, low D value) to 14,394 (38.4 percent, high D value) spring chinook adults.
- Upper Columbia steelhead with no transportation at McNary lose up to 1,179 adults or 11.8 percent of the total number of returns. With transportation at McNary, Upper Columbia steelhead lose up to 358 adults (3.7 percent) with low D values and gain 6,610 adults (37.5 percent) with high D values.

RECOMMENDATIONS

Based on the results of the analysis the Staff makes the following recommendations:

- Do not spill at Lower Granite, Little Goose, Lower Monumental, Ice Harbor or McNary dams. Spill at Lower Granite, Little Goose and Lower Monumental is eliminated under full implementation of the 2000 Biological Opinion. Spill at Ice Harbor Dam is of little value because most Snake River juveniles have been transported so few fish remain in the river. McNary spill is of lesser importance because its juvenile bypass system is fairly effective in routing juveniles away from turbines.
- Maximize transportation at all FCRPS collector dams, including McNary. Maximum transport of juveniles at the Lower Snake dams is already called for under full implementation of the 2000 Biological Opinion. Transporting juveniles at McNary makes sense because it increases Upper Columbia spring chinook survival under all conditions and Upper Columbia steelhead survival under most conditions. McNary transport also makes sense because of the potential in 2001 for poorer inriver migrating conditions. If transportation takes place it should be fully evaluated for its benefits. The information gained will be useful for guidance in future years, particularly under poor water conditions.
- Utilize surface spill at dams to pass juveniles wherever possible and when benefits are likely. In general, surface spill at dams is effective in passing juveniles with much less water than via the spillway. For example, studies at The Dalles sluiceway (which uses low flow surface spill) indicate that approximately 43 percent of inriver fish pass via the sluiceway when there is no spillway spill. [11]
- If water is available for additional spill, focus spill to optimize benefits to Middle Columbia steelhead and to a lesser extent remaining inriver Upper Columbia spring chinook and steelhead. If spill takes place at all, it should be employed at Bonneville, The Dalles and John Day, to benefit the Middle Columbia steelhead. For the most part, this listed stock will not be transported and must pass the lower three mainstem dams. Spill could take place during dusk and in the early morning to optimize fish passage.
- Although major changes in the fish passage structures at the dams are unlikely to be accomplished this year, the Corps should immediately accelerate development of surface-oriented bypass systems which, in effect, allow juvenile fish to have the advantages of spill without the large impact on power generation. It is evident that the current method of producing spill by opening a gate 40–50 feet below the surface of the reservoir is a relatively inefficient way to provide passage to juvenile salmon and steelhead, which are near the surface.

Mr. CALVERT. I'll ask Dr. Anderson a question, because maybe this has all been related to the entire panel here.

Obviously, it's a concern that we all share, that—that the salmon population has increased and that we don't consciously do anything that would irreparably harm that resource.

However, your testimony is interesting in that you believe that we can possibly have additional electricity this summer without irreparably harming the fish population by utilizing the technologies that have been operating here for the last number of years, large technology.

Is that—is that correct, when I say that?

Mr. ANDERSON. Particularly for the spring runs, the ones that, unfortunately, have come up through the river already—have gone down through the river—barging work is tremendous. We have good data for that, for the summer run. The fall chinook come through later on. We really don't have good information on how well that's going to work. Unfortunately, as a scientist, I can give you a mixed answer. We have a tendency to do that.

With barging, we have the capacity to improve it for some of the runs. So I think that it is something that needs to be considered.

[11] Rock Peters, Corps of Engineers, Personal Communication.

We need to continue to look at the data, that yes, we have more flexibility.

Mr. CALVERT. I'm a believer in science rather than—you know, outcome-produced science rather than real science to make sure that we are doing the right thing.

Ms. Patton, I congratulate you on the work on wind and solar. I used to be Chairman of the Energy Environment Committee. We've done a lot on renewable energy. I will say that—you know, I know that people like to make fun of California right now, but we have a significant amount of renewable energy in California. People will be surprised to know that the largest amount of wind is in California. It happens to be in my home county, Riverside County. The largest utilization of solar in the United States is in California. The largest utilization of geothermal in the United States is in California. But obviously, that's—that's not enough to make up for the shortfall that we're experiencing.

But what's important in the interrelationship that Dr. Anderson is describing—even with the additional 400 megawatts we have online, that only makes up about half of the loss—from the biological opinions, as I understand it—in the shortfall of water.

And in fact, it's not assisting the salmon population. That—that has a direct effect on Mr. Lepp, because if, in fact, we're spilling water for no good purpose—in effect to increase salmon population—.

Your company—and I don't know how you'll get through this summer—I hope you do—you know, I—we need a strong steel industry in this country, and your increased power rates—$6 million, I think you mentioned--.

Mr. LEPP. I said it was just the last increment. It's already gone up over 12 million.

Mr. CALVERT. Obviously, you can't keep your doors open with that type of situation.

So it's important that we get the science together to—to make sure this, in fact, is—is the case and we can continue to maintain fish population—and actually increase fish population, as we experienced this year. And let's not do something that has this—unintended consequences as losing an industry such as yours. And obviously, that is something we certainly don't want to do.

Yes, Ms. Patton.

Ms. PATTON. I just wanted to respond briefly, that right now, the—there is no spill for salmon, and--.

Mr. CALVERT. Has there been some spill—.

Mr. SMITH. Just this week.

Ms. PATTON. Just this week. There have been some arrangements for a very small amount of smolt, but there is no spill for salmon.

I would also mention—and in another capacity, I'm the Vice President of the Board of Save our World Salmon—that it's—the peer-reviewed science coming out of the Army Corps of Engineers' past study showed that, in fact, the—the—the barging was not the best way to save salmon, quite clearly, and that we will need a more natural river in order to make the salmon come back.

Mr. CALVERT. Obviously, there is a disagreement with that.

Ms. PATTON. There is. I'm not a scientist, so I can't review that credential. I just want to refer you to the Army Corps of Engineers' science, the—the past analysis.

Mr. CALVERT. I guess in conclusion—and my time has come up—is that we do have more fish this year. That's the happy news.

Ms. PATTON. And there was more spilled when those fish went to sea. It wasn't just ocean conditions.

Mr. CALVERT. More fish is good, then.

So that's—I'll give it to Mr. Smith.

Mr. SMITH. Thanks.

I think I just have two questions, one for Ms. Patton and one for Mr. Walton.

On the—I'm very encouraged by your remarks on renewables and focusing on engineer efficiency, not just, you know, doing less with less—I mean doing more with less—and the opportunities that are out there. And the more I read about it, it's really quite exciting. The technology, I mean, not—obviously, this isn't my field of expertise, so I'm sure that there is more than I know about.

But just from what I know about, from biomass fuel cell and a variety of energy efficiency plans, there is a massive amount of things that we can do.

And the primary reason why we haven't done them to the degree that we have is because—well, fossil fuels are cheaper, if you look at it from just the standpoint of buying it; that—they used to be cheaper. They, in some cases, still are.

But I think the issue is really sort of getting us to look at the full cost of a fossil-fuel based energy system.

Now, if you look at it, it's simply what you're paying at the pump or what you're paying on your electricity bill. You're not looking at the impacts on the environment and the full impacts that—not to mention the fact that we are dependent on fossil fuels. We will be dependent on foreign sources. That's where they are. Certainly, that's where oil is, at any rate.

So shifting to renewables and shifting to these alternative sources is absolutely critical. But a lot of people will look at it and say, "Well, yeah. Yeah. We can do a little bit here and a little bit there, but it's never really going to amount to much.".

I wonder if you can just comment briefly on it. If we made the investment in REE, in tax credits, in setting standards—like cafe standards or standards for air conditioners—if we really committed ourselves to it, what—how dramatic a shift can we have in what we use for energy?

Ms. PATTON. I think there is no question that we could meet all of our electricity demand with clean renewables and energy efficiency. 133,000 average megawatts of wind supply is enough and is way more than we're using now and way more than our—and you would never want to—to do that, you know, monolithic. You would want to have a diverse supply, obviously.

But there is no question that the kinds of things you're talking about—biomass fuel cells coming on board and the ability to have a more resilient system with that kind of distributed generation and clean renewables means that we have a way to have a clean, affordable energy future that's based on renewable energy.

And as some people have said, with regard to the age of petroleum, the Stone Age didn't end because we ran out of rocks. And we're not—the Petroleum Age is not going to end because we ran out of oil. It's going to end because we have much better alternatives.

Mr. SMITH. Mr. Walton commented on the deregulation situation, and it's sort of popular, accepted fact right now that the energy problems that we have cannot really be the fault of deregulation because we haven't really deregulated. We just sort of regulated in a different way. And there is a certain amount of truth to that, particularly if you look at the retail side of it.

Certainly in California, one of the reasons that the crisis got worse and became a credit crisis was because the prices were not passed on to the consumers for the longest time. Retail consumers had no incentive, really, to decrease their demand because that was still regulated.

But on the wholesale side of the equation, isn't it fairly—wholesale and also in generation—isn't it somewhat fair to say that we have pretty much a deregulated power system in terms of—you know, no one's required to generate power, no one's required to build new generation, and they can charge pretty much whatever they want on the wholesale market? I could be wrong here. So I'm just asking.

But isn't it fairly—you know, isn't it fair to say that we do have a deregulated wholesale system, and aren't we really sort of seeing the limitations of taking that approach?

As someone who has to do with the public utilities and being very involved in it—and I'm just kind of curious about your comments on that.

Mr. WALTON. Steve Klein said earlier that Tacoma didn't take a stand either way, and neither did PPC. But I think you're right, that—particularly with the advent of the interdependent power producers, there was a large sector of unregulated generation in the system.

As Congressman DeFazio has pointed out numerous times, however, one of the things that troubles me is the loss of the obligation to serve. And I think taken, for instance, as a West Coast system, it's—it's very troubling that nobody is in charge of West Coast reliability, no one entity. Not FERC, not the Secretary of Energy, not Bonneville has—has the job of trying to keep the lights on everywhere.

The fact that some of the generators can sit back and wait for higher prices and don't have an obligation to serve puts the utilities in an extremely uncomfortable position.

So I think that we may be part of the way toward deregulation, but that's why I refer to it as being kind of high-centered in the middle. You're not getting the, quote, "genius of the marketplace" as advocates of deregulation would have us."

Mr. SMITH. Well, why not—if I could explore that for just a moment—on the wholesale situation? I mean, if there is no obligation to serve, you can charge whatever you want to charge in the wholesale market, why aren't we getting the genius of the market? I mean, why isn't it working?

Mr. WALTON. Congressman, I'm far from an expert on this, and there are people in the room—and probably members of your Subcommittee—better to answer that question than I.

But it certainly seems to me that the California experiment failed to connect the different parts of the market together. It was far from—from free.

PGE—PG&E and Southern California Edison, as I understand it, were both forced to buy high and sell low. That's not a free market. I'm worried that Bonneville can be put in the same position if we don't watch out up here. And certainly, the transmission system, as you've also pointed out, isn't far enough along to allow the free exchange.

Other speakers today have also pointed out that what used to work well on the West Coast—where California could send us power when we needed it and vice versa—has been severely curtailed due to the California experience and the drought.

So there are a number of things that have combined, as Dr. Karier mention—the "perfect storm" analogy—has all come together at once.

Mr. SMITH. Thank you.

Mr. CALVERT. Mr. DeFazio?

Mr. DEFAZIO. Thank you, Mr. Chairman.

Ms. Patton, I didn't quite catch you. You said—you captured 1,500 megawatts of conservation back in the early '90's before Randy Harvey panicked and cut off all the funding of BPA.

Now, was that 1,500 megawatts caused by coercion, or was it—what were the techniques used? Was it sky-high prices so people were desperate?

Ms. PATTON. No. It was, in fact, a combination, a small amount that came from good energy codes based on cost-effective—.

Mr. DEFAZIO. Mandates?

Ms. PATTON. 200 megawatts of that.

Mr. DEFAZIO. That was a mandate.

Ms. PATTON. That was a mandate.

But they were also set at what was (inaudible) at the market price. They were not set at the marginal cost of energy. Most of that 1,500 megawatts came in as a result of utilities joining with their customers. The customers paid some of the costs of a new efficiency improvement, and the utilities paid another part of it to make it cost-effective to everybody so that you had zero-interest loans for residential organizations, rebates on an efficient (inaudible) industrial motors, you know, the kinds of heating ventilation and air-conditioning design (inaudible) new commercial buildings so that we had a sharing of the cost. And it made it a good deal for everybody. But they were not coercions. They were voluntary. And they were-- and there was opposition.

Mr. DEFAZIO. And it was at 2 to 2 and a half cents?

Ms. PATTON. That's right.

Mr. DEFAZIO. Which, in today's market, would be--.

Ms. PATTON. A dream.

Mr. DEFAZIO. —a dream?

What's your price on the 2,400 average megawatts you predicted?

Ms. PATTON. I have to conduct a full analysis of that from the Power Council. What they looked at with their 1,500 megawatts,

which they did the full analysis on, was an average of 1.7 cents a kilowatt hour.

Mr. DEFAZIO. Is that 1,500 available now?

Ms. PATTON. Yeah. I mean—.

Mr. DEFAZIO. At 1.7 cents a kilowatt hour?

Ms. PATTON. Exactly. And the whole reason is lost by not investing over this last period of time—is enormous, especially given the current—Seattle City Light continued to invest in conservation and—as did PG&E Water and Electric.

Mr. DEFAZIO. And wouldn't that be a bit of a problem with a tiered rate structure—to take those utilities which raised private funds in the private markets, bonded, and vested—if we were suddenly to say to them, "Well, you, like everybody else, those who have done nothing"—which some utilities have done—"will see a 25 percent penalty rate on your consumption"?

Ms. PATTON. Not support those tiered rates. Right.

Mr. DEFAZIO. And so you're saying there's 2,400 megawatts out there? Could you give a price? I'd be interested in a price.

Ms. PATTON. Again, a specific one (inaudible) Seattle and looked at—any energy jurisdiction which is done with regard to conservation of energy stock saw another 250 average megawatts at 1.8 to 2.1 cents a kilowatt hour.

So I think we're in the range of (inaudible) cents a kilowatt hour for even that 2,400—.

Mr. DEFAZIO. Okay. And today, in the wholesale market and energy—I have trouble always coming up with my conversions—but it's selling at about 50 cents a kilowatt hour?

Ms. PATTON. Yeah. You just--.

Mr. DEFAZIO. Right. So you substitute 2 cents conservation for a 50-cent purchase? The conservation provides a permanent benefit? The 50-cent purchase keeps the lights on for the next millisecond?

Ms. PATTON. Yeah, as well as more homes and businesses.

Mr. DEFAZIO. It doesn't sound like it's too tough of an equation.

Mr. Lepp, this—the two-tiered rate—you gave a number, but I don't know how that related to a percentage increase. You said you had a 53 percent rate increase, and you said a tiered rate would cost you 6- to $10 million. What would it be? Another doubling of your rate or—.

Mr. LEPP. It would be another 50 percent.

Mr. DEFAZIO. Another 50 percent on your rate.

And would it be similar for every other industrial customer, every other business except for DSI's—is that correct?—that tiered rate?

Mr. LEPP. In Seattle City Light's area, it depends on the proportion of the power that they pull from Bonneville. And in the past—

Mr. DEFAZIO. Right.

But any BPA customer who is a business would see those sorts of rate increases under the tired rate?

Mr. LEPP. Right.

Mr. DEFAZIO. And then finally, to Mr. Walton.

That was great testimony. A lot of witnesses comment on what people have said before. But you comment on what other witnesses

said before you. It makes for a much more interesting sort of discussion.

You were put to the—the question by Mr. Smith on the issue of deregulating one side and not the other.

Are you familiar with Montana's situation? In Montana, they did deregulate both sides for business; isn't that correct?

Mr. WALTON. Yes.

Mr. DEFAZIO. And as I understand it now, all of their heavy industry—or virtually all of their heavy industry—is closed or closing, and many of the small businesses are threatened with closure, and the State is desperately trying to find power because they deregulated both sides, unlike California.

And so what happens in the case of Montana, as I understand it—and correct me if I'm wrong—is PP&L of Pennsylvania—Pennsylvania Power and Light—bought all of the generation from Montana Power, and they are now able to get higher prices outside the state of Montana; so Montana, which had the sixth lowest rate in the United States of America and 150 percent surplus in terms of power generation, now has a point at which its businesses cannot afford to buy power and is saying that they're deficient in power because the power is being sold for a higher price elsewhere. Is that essentially an encapsulation of that situation?

Mr. WALTON. Mr. DeFazio, I believe it is, with the exception that the cooperatively owned utilities in Western Montana, the Bonneville customers—some of them had the extreme foresight to purchase presubscription contracts. So they're looking pretty good.

I think your description of what happened to Montana Power was accurate, as I understand it. And I also followed, from a distance, the fact that the legislature had a special session. And the question for them was would they give the Public Services Commission the authority to oversee the sale, by Montana Power, of their assets.

And it's my understanding that they didn't have much authority. So Montana Power essentially got to pick the purchaser. And so this thing has kind of snowballed. And I think that's turned into an example—another example of how not to proceed with energy costs.

Mr. DEFAZIO. And that in the one area the people most frequently say is the outstanding success of deregulation—Pennsylvania—are you familiar with the fact that, Pennsylvania has capped rates in a deregulated—so-called "deregulated environment"—that less than 10 percent of the customers have chosen the thing that we were all told they wanted—which no one in California wanted either—which was customer choice—and that, in fact, of course, Pennsylvania is also blessed with the fact that the part of PJM which has mandatory scheduling authority as a regional transmission organization—and finally, of course, that their economy is depressed, so they have a little bit of a surplus of power right now?

But everybody is kind of worried about what happens when the rate caps come off in 4 years. But right now it's a success. Deregulation of the rate caps is a success in Pennsylvania, sort of.

Thank you very much.

Mr. CALVERT. Mr. Larsen?

Mr. LARSEN. Thank you, Mr. Chairman.

Ms. Patton, I'm glad you're here today. (Inaudible) a reminder that the impacts that were seen from the energy crisis in the Northwest has a direct impact on consumers and homeowners and (inaudible) folks on your list, all the opportunity council members, Puget Sound Council of Senior Citizens, the Washington State Association of Community Action Agencies. These are groups that are serving low-income, moderate-income people throughout the Northwest.

So I'm glad that you're here. And I wanted to give you a very brief opportunity—not to cover all the recommendations—but—in the "what Congress can do" section—but do you have three or four that you think would have the best, most immediate impact on low-income, moderate-income individuals?

Ms. PATTON. Well, the first one is the continued Congressional support, Federal support for low-income organizations. That's incredibly important. We've been working on this in this region really hard, and I will have to commend Bonneville for the one thing that Bonneville continued to do when it was cutting its conservation (inaudible).

One of the major things they continue to do is more slashing of conservation by 80 percent—was to fund low-income organizations. It's incredibly important for low-income households to have more efficient trailers and more efficient homes to live in—and so strong support for that, strong support also for energy assistance, because low-income households are being hit, of course, much harder by the entire rate even though utilities are working—the utilities in this region are doing a good job. I think they're trying to work with that situation, but Federal support is critical.

Mr. LARSEN. Dr. Anderson, did you talk a little bit earlier about how you would factor (inaudible) oscillation into drought management and, therefore, it hurts availability?

Mr. ANDERSON. That's a good question. There are efforts now to understand how we want to predict that. Looking back in the hundred-year record, we do see these clear, distinct signals of ecosystems throughout the Pacific, throughout the (inaudible).

So one of the things we could factor in—to state that these cycles are going to continue with global warming, I guess that's—that's not a good scientific approach, of course.

The other more scientific way to do this—there's some work that's going on right now showing that a number of factors added together give the ability to predict over the short term a couple of years.

Also, we have scientists—scientists are out studying the plankton off the coast. What we're finding is when the ocean is fertile, the fish survive well. So a monitoring scheme that is going on right now can give us information that's going to say, "Things are good this year. Let's give ourselves a little bit of slack somewhere else in the system.".

I think that as research goes on, we will increase our ability to predict, maybe in a couple months, maybe in a year or two. But right now we're not using any of this information. We're not factoring in the ocean at all. Any information we do have, we'll probably make decisions on the hydrosystem.

Mr. LARSEN. I think it's like anything else. We need to be careful, as well, about saying, "It's only PDO," and—and looking at that as only one factor. And it's quite a myriad of factors.

Mr. ANDERSON. Right. And they're beginning to—they—they have a four-factor analysis right now that—that's—is looking encouraging. They are doing something like this for hurricanes—a fellow named Robert Gray—who has done very well predicting hurricanes. But—.

Mr. LARSEN. Mr. Lepp, good to see you again. And I just shudder when I read headlines like I read in the Seattle PI today because my—in Bellingham, I see headlines like that day in and day out, with companies shutting down, possibly, and Birmingham Steel possibly being up for sale—which, you know, you just—provides uncertainty in the community here.

I don't know if there is a question in there, but more just to say that it's another clear example of the impacts the energy crisis is having on the Northwest.

And if you have anything to add to that, feel free.

Mr. LEPP. Well, you know, there are 19 North American steel companies that have gone bankrupt in the last 18 months. And part of it, I know, from my standpoint of the products we sell—our price today is the same as it was in 1972. So we have survived our ability to—to maintain efficiency and keep looking for that—that edge.

And you know, this—this circumstance here is really—is really (inaudible). We were nicely profitable going into it, and this thing just—just wiped us out—well, this plus the gas. Our gas price has tripled since October of last year. That's another part of this.

And we—we export a third of our products, which is probably—I would say probably the only American steel plant that does that. There's not many exports of steel other than what we do. We do a commodity product, so we've got to be really, really efficient. And we are. We are really proud of our efficiency. But I just can't—it creates a hurdle we just can't clear, as much as we'd like to.

And we're not going to compromise our environmental programs; our safety programs; and those things that are near and dear to us, to our employees. So those stay intact, and we keep doing what we can do to survive.

Mr. LARSEN. Thanks for your comments, sir. Thank you.

Thank you, Mr. Chairman.

Mr. CALVERT. I want to thank this panel for your testimony and answering our questions.

I want to thank Mr. Smith, his hospitality here in Tacoma—.

And to the audience for your willingness to come on this Saturday and sacrifice part of your weekend.

With that, this hearing is adjourned.

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

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