Environmental Discussions on Dangers with Nuclear Power
Seattle City Council Energy Committee
August 13, 2014
Audio Transcript

Click here for **video recording** (scroll down to 8/13/2014 hearing)

Chair: Kshama Sawant
Council Members: Sally Clark and Michael O'Brien

Panelists

Sara Patton, Executive Director, Northwest Energy Coalition
Bruce Amundson
Gerry Pollet, Executive Director, Heart of America Northwest
Dave Gurlick
Brian Grunkemeyer
Chuck Johnson
Peggy Maze Johnson
Ted Virdone
Tom Buchanan

[Kshama Sawant (KS) 00:26]

Good morning, everybody. It's August 13, 2014. It's 9:36 AM. We are in City Council Chambers in Seattle. This is the Energy Committee that's a regular time…we're joined by Council members Sally Clark and Mike O'Brien. Thank you for being here.

Today's meeting, hopefully, will be interesting and exciting because we have dedicated most of this meeting to giving environmental activists the opportunity to talk about the impact of different energy production methods. In particular, we will be discussing the Columbia Generating Station, Washington State's only nuclear power plant and the dangers of nuclear energy. And we'll have hopefully some enlightenment on what the dangers are of nuclear energy. There's often a lot of misconceptions that is the clean alternative to burning fossil fuel and I hope that there will be some clarity on that. And also what are the real clean energy sources…if it's not nuclear, is it natural gas…that's another rumor that's floating around so we'll have to discuss that as well.

So what are the truly clean renewable energy sources that we should be moving towards? And I think that it's not coincidental that we're having this discussion in the wake of the meltdown from the Fukushima nuclear reactor, because it demonstrates the importance of having a discussion like this…the unacceptable level of danger, the unacceptable probability of catastrophe that is involved in using nuclear power.

I strongly support transitioning away from fossil fuels, because of the impending ecological crisis of climate change. But we have to come up with real alternatives to fossil fuel and ideally this discussion can be a small model of how we can transition the whole world towards green energy. And if we can replace the Columbia Generating Station with green energy, then environmentalists in Montana can do the same with their coal plans. And, of course, that will involves further discussions about, well, doesn't that, isn't that going to kill jobs? I mean in order to have jobs do we have to have destructive energy source as well and doesn't that present a challenge for us? So hopefully those will be dealt with in future discussions as well.

We know we live in a global ecology and it's going to take an international political struggle to put the interest of the seven billion people of this world above profits. And, in my view, discussions like this are situated in that overall global framework of conversations.

This Energy Committee meeting will be somewhat unique because environmental activists are rarely given a governmental meeting all to themselves in order to discuss what dangers face society. Corporations that engage in polluting and who don't have private incentives to move towards renewable energy often have meetings all the time. But environmentalists are usually only invited to meetings structured as a debate. So I think that it is only appropriate that we have a meeting that is…that can be devoted to this discussion.

Before we invite the panelists to the table of course we have public comment.

[Public comment period omitted.]

PANEL DISCUSSION ON NUCLEAR POWER

So the first item is nuclear discussion. Will the panelists come forward and Clay you should come here.

(11:56) So first please all of you just going around and introduce yourselves and where you come from, and I also have my legislative aide, Ted Virdone, just in case we can facilitate the discussion as well because he's also been delving into these issues somewhat. So we will start with you.

[Sara Patton (SP)] Hi, I'm Sara Patton. I'm the executive director of the Northwest Energy Coalition.

[Bruce Amundson (BA)]
And I'm Bruce Amundson. I am the president of the Washington Physicians for Social Responsibility.

[Gerry Pollet (GP)]
Gerry Pollet, and I'm executive director of the sixteen thousand member Heart of America Northwest, focusing on the clean up of Hanford.

[KS 12:32]
And also just everybody please use your microphones very close to your mouths and make sure they are turned on…

[Audience member 12:35] Yes…I can't hear you…

[Dave Gurlick (DG)]
I'm Dave Gurlick. I'm a retired physicist and I work for the Energy Committee of the Sierra Club.

[Brian Grunkemeyer (BG)]
Brian Grunkemeyer. Chair of the Energy Committee for the Sierra Club.

[Chuck Johnson (CJ)]
I'm Chuck Johnson and I'm staff to the Oregon and Washington joint task force on nuclear energy for the Physicians for Social Responsibility.

[PMJ]
My name is Peggy Maze Johnson and I'm program manager for Heart of American Northwest.

[Ted Virdone (TB)]
I'm Ted Virdone. I'm Kshama's legislative aid and I've been looking into this issue.

[KS]
And he is very shy about being here (chuckles). So who is going to kick it…kick this off?

[BA 13:24]
I will lead off and I want to thank the Committee very much for giving us this opportunity to testify. To summarize our planned presentations, we'll review the information on the Columbia Generation Station, present data from studies that we have commissioned that make the case of the continuing operation of this nuclear power plant as no longer defensible, either from a public health and safety perspective, or an economic.

PSR Washington, Physicians for Social Responsibility has been a nuclear skeptic since nineteen seventies and continues to examine the operation of commercial nuclear power plants with a critical eye. The CGS nuclear power plant was once known as the Washington Public Power Supply System or WPPSS two, and has operated for thirty years on the nuclear reservation.

During the first round, of presentation we will outline for topics for the Council to consider. First, the similarity of design of the CGS plant to the nuclear plants that melted down in Fukushima in 2011. Second, seismic studies that indicate the potential for greater ground motion at the plant site in the event of an earthquake than was known or planned for when the plant was initially built. You'll know the study in your packet from engineering geologist Terry Tolan. Third, the generations' storage of highly radioactive spent fuel at CGS and, finally, past radiation exposure and potential hazards to workers at the plant. I'll cover the first two topics, followed by state representative Gerry Pollet from and for American Northwest who is on my left.

After these initial presentations, Peggy Maze Johnson from Heart of America staff will give a brief history of the Seattle City Council's oppositions to WPPSS plants nuclear four and five. Chuck Johnson, PSR staff member will then explain the current ownership in control of the CGS plant and present the findings of economist Robert McCullough's study of the economic cost of CGS to the region. Mr. McCullough's study, along with supporting material, is also in your packet. Sarah Patton, from Northwest Energy Coalition, will then present, followed by the representative from the Sierra Club.

So where to begin? It is the similarity in design between the general electric boiling water reactors that melted down and exploded in Fukushima and the CGS station that first attracted our organization's attention. CGS has been operating in relative anonymity for nearly thirty years and was in the process of getting a license to extend its operations beyond its originally designed forty year lifespan or until twenty forty three.

However, we are aware of a nuclear regulatory commission report, published in nineteen ninety three, that confirmed age related degradation in boiling water reactors before the exploration of the forty year licenses that damaged or destroyed vital safety components inside the reactor vessels.

That study reported that key components were vulnerable to deterioration due to chronic radiation exposure, sustained extreme heat exposure, fatigue, and corrosion from chemicals. What we learned in the wake of the multiple accidents at Fukushima was that the CGS nuclear power plant was build with similar design flaws to those exposed in Japan. Like those in Japan, it is also a GE boiling water reactor of slightly more recent vintage. It has a GE Mark II containment structure around its reactor while those that suffered hydrogen explosion in Japan were Mark I containments. But nevertheless, the basic flaw, a small and narrow containment building, is common to both, Mark I and Mark II containment vessels. This small containment is vulnerable to a loss of coolant accident as occurred in Japan when power and water pumping were shut off due to the earthquake.

A nuclear reactor core, even when it has been shut down and is control…and as its control rises in place, remains hellishly hot and must be continually cooled by water. If that water supply is cut off, even for a few hours, water can boil away exposing the fuel rising in the reactor to the air…and resulting in the melting of the zirconium cladding of the uranium fuel and of the fuel itself. Radioactive materials are vaporized as the fuel catches fire and hydrogen gas is produced. The small containment of the GE reactors can be overwhelmed by pressure, forcing a breeze that releases both, radioactive material and hydrogen; the hydrogen can collect, within the reactor building, with a spark explode.

The potential…this potential with the GE boiling water reactors has been known since the nineteen seventies, but was deemed too unlikely by the U.S. Nuclear Regulatory Commission. Addressing it would have led to repairs, delays, and cancellations in over thirty reactors either already build or, like the CGS, under construction in the US at the time. Unfortunately, this exact meltdown and hydrogen explosion scenario played out multiple times with the reactors at Fukushima resulting in the contamination of the Northern part of Honshu Island, the evacuation of 300,000 people and the continuing crisis as workers try to control hundreds of thousands of gallons of radioactive water from making its way to the Pacific Ocean.

In addition to the problem of pouring water into the leaking reactor buildings to keep the molten cores cool after the accidents, crews began feverishly shoring up damage spent fuel pools which are suspended a remarkable six stories above the ground.

The Columbia Generating…System nuclear power plant continues both of the design problems exposed by Fukushima. A small containment vessel can be overwhelmed by pressure and lead to hydrogen explosions in the loss of coolant accidents and an elevated spent fuel pool that is vulnerable to the release of massive amounts of radioactive material if the pool leaks and exposes the extremely hot fuel to the air. State representative Gerry Pollet will talk about the significance of the fuel storage pool in a moment.

With regard to the first design flaw, the U.S. Nuclear Regulatory Commission is slowly requiring modification of GE boiling water reactors with undersized containments. CGS plant operator Energy Northwest has been ordered to place hardened vents in this containment vessel to release hydrogen and radioactive gases into the atmosphere in order to prevent pressure build ups and subsequent explosions of hydrogen and even greater releases of radioactive material. Initially, this work was supposed to be completed by twenty fifteen. The NRC has now given the Energy Northwest until summer of twenty seventeen to complete this work. Until then, this demonstrably unsafe reactor is scheduled to operate without a vent in its containment vessel and therefore vulnerable.

This brings me to the second topic we wish to cover, which is seismic data. Recognizing that tsunamis do not pose a risk at Hanford, we began to investigate what other types of occurrences could potentially lead to a major accident of the CGS. The most likely disaster scenario is a major earthquake in the Mid-Columbia basin.

Geologic knowledge of the region has grown enormously in recent years. When the plant was licensed in nineteen eighty four, a ground motion of point two five Gs was established as the basis for the design of the plant. Ground motion is calculated based on the size, strength, duration and proximity of an earthquake and its expected effect on the soil, surrounding the structure. The design basis of a structure is the amount of ground motion that it is able to withstand without suffering structural damage. At that time, point two five Gs was beyond what was expected by the geologists hired by WPPSS, as Energy Northwest was know in those days.

Since that time, the U.S. Geological Survey has been actively researching Mid-Columbia basin on behalf of the U.S. Department of Energy and other agencies and has found a much greater potential for large earthquakes than previously considered. In addition to finding numerous additional faults in the area, faults have been found to be deeper, connected to deeper layers of rock, which can produce a much stronger seismic effects.

Longer faults have also been found extending all the way…to Puget Sound and earthquakes are believed to occur much more frequently than previously thought. One deep fault is now known to be within two point three to the CGS power plant whereas before, the closest fault was believed to be five miles.

It is very significant that the U.S. Department of Energy, which has been frequently criticized for breaches and safety at Hanford, has taken these new geologic studies seriously. Ten miles from the CGS plant, construction of its waste treatment plant, designed to process liquid waste into glass logs, was halted for a year in two thousand and five in order to address construction modifications to raise the building's design capacity from a point five G to point six, or more than twice the ground motion on which the CGS was designed.

In addition, the pool water, containing large…So while the U.S Department of Energy is now acting upon the new seismic information on Hanford, the Nuclear Regulatory Commission has allowed an earthquake study, commissioned by Energy Northwest after the Fukushima accident to languish only requiring that they compete their work by March twenty fifteen and has ignored independent efforts to present our new data to them.

We have repeatedly seen earthquakes not obey the slow bureaucratic timetables of…agencies and we believe ignoring the clear danger indicated by the U.S.G.S. Survey research is inexcusable, and, on that basis alone, the plants should be

closed until it can be proved to be seismically sound. And with that, I'll yield to Gerry Pollet.

[KS 22:58]
Thank you. Just one thing I wanted to put…out for the audience. This is a really good booklet that is put out by Seattle City Light: Fingertip Facts. Just wanted to point out that. I mean on page nineteen, it shows the two thousand twelve fuel mix, and you can see that close to ninety percent of the fuel comes from hydro. 4.4% comes from nuclear…so, just to talk about why this discussion is relevant for us and from the Columbia Generating Station, of course, where I think Seattle City Light has a board position.

[GP 23:41]

Thank you for having this briefing today, Council members and Chair Sawant. This is a very important opportunity. As you said it's rare for citizen activists and organizations to have the opportunity to brief the council or any elected body and… I'm sorry. The light's on. Is that good?

[KS]
You have to be very close.

[GP]
All right. I will eat the mic as we say…and, so I've…We greatly appreciate this opportunity to talk about Seattle's ownership, Seattle rate payers' risk economically and, of course, our region's risk in terms of safety.

Many of you know me in terms of my work for decades on the cleanup of the Hanford Nuclear Reservation. I actually began my carrier working as…reviewing electric utility economic forecasts and working on econometric forecasting, including with Don Shakow, who is the guru, so to speak, hired by the Seattle City Council which, for the study that took Seattle out of WPPSS four and five, fortunately.

In terms of Hanford and the connection, the waste that isn't high level spent fuel from this reactor, goes to an unlined and leaking set of ditches at the Hanford Nuclear Reservation, the commercial radioactive waste dump, which is leaking as we speak and is unlined. There is a direct connection in terms of waste. We also know that, everyone is aware, there is no place to put the spent fuel and it will be sitting there and, thus, we have a major discussion about what happens even before the fuel is removed from the spent fuel pool and put into dry casks. What happens in the event of an accident?

Before we get there let me just say, we're urging that the City of Seattle should fully use its position on the Energy Northwest board, the WNP two participants board, to follow up on the report of Robert McCullough and ask: How can we replace the power from this reactor? Can we go out and purchase it in the very near term?

There are concrete ways of replacing the power and saving the region's rate payers one point billion dollars. Now, those concrete ways of replacing the power are not Helium three and hot air; they are real…and McCullough's report shows that if we were to simply go out and buy power next year, on the Mid-Columbia market, we could save the rate payers of this region.

One point seven billion dollars over the lifetime of the reactor in constant today's dollars is about the same amount in today's dollars as the entire stabilization fund for City Light. We're talking about quite a bit of money, even at our five percent, four and a half percent participation in this reactor. So it is of great economic interest to the rate payers to understand that it is cheaper today to buy power on the market than to continue operating this reactor, even if it were not a question of urgent safety to proceed with phasing out the use of this reactor…and we urge that the city uses its position to move ahead in that regard.

The city has not used its position in this regard, repeatedly. One of the reasons this is so welcome that you're hold this briefing today and have invited us is that, despite numerous efforts to have City Light use its position during the relicensing to have a hearing on the relicensing of the reactor held here in Seattle and other areas where the rate payers who are paying the bills for the reactor would be able to testify, Energy Northwest refused to do so and City Light did not back us up in insisting that there be hearings where the rate payers live, not just in Richland where the workers are who benefit from keeping the reactor going.

The spent fuel pool at CGS is stories above the ground. It is forty feet deep, forty feet wide, forty feet long. It has to maintain twenty two fee of water above the fuel in order to keep it cool…and it contains as much radioactivity today as in all of those high level nuclear waste tanks that you hear about at Hanford.

One of the more unique problems of this reactor, which we tried to raise during the relicensing issue, and which needs to be born in mind, is the fact that, in the event of an earthquake, and doctor Amundson has talked about the fact that, indeed, this plant is not designed to the same…to withstand the same earthquake that we have had to retrofit the massive new nuclear chemical processing facility for nuclear waste at Hanford six miles away…In the event of that predictable earthquake, Hanford is unique amongst all commercial reactors in the country because of its co-location with other nuclear facilities that are going to fail in a much milder earthquake than the design basis earthquake.

So, not far away is, right alongside the Columbia river, we have two pools where spent fuel from the N-reactor was stored. We've spent hundreds and hundreds of millions of dollars, over fifteen years, to try to get the sludge and the waste out of those pools so that they do not threaten the Columbia River and everything in Eastern Washington in the event of loss of coolant.

Yet, six stories above the ground, we have the CGS spent fuel pool. A few miles away, we have a pool containing cesium and strontium at, what has been described by the Department of Energy's own inspector general as the most at-risk nuclear facility in the entire nation, what's called the **WESEF? (30:43)** swimming pool, storing these cesium and strontium capsules. In the event of a fairly mild earthquake, it will lose its coolant. The levels of radiation will be lethal, and it is ridiculous to believe that we are going to be able to simultaneously try to provide water to facilities like that and the CGS spent-fuel pool several stories up in the air, because the spent-fuel pool at CGS is one of only ten in the nation that lacks a primary backup power system. Its replacement water supply is essentially fire hoses, fire hydrants, and using hoses from the spray pond. But NRC refused to consider, and Energy Northwest turns a blind eye to the fact, that in the event of a fairly mild earthquake, we're going to have other releases that prevent emergency responders from even being out and delivering additional diesel generators to get that backup power.

[KS 32:06]
Just for the benefit of our listeners and viewers, can you just explain briefly what Energy Northwest is, and also CGS is Columbia Generating Station. What you refer to as WPPSS is Washington Public Power Supply System.

[GP 32:21]
So…Energy Northwest used to be called WPPSS or the Washington Power Supply System and for public relations purposes after the largest municipal default in the history of the nation its name was changed to Energy Northwest and the reactors name was changed from WPPSS number 2 or WNP-2 to the Columbia Generation Station. Notice, it does not include nuclear in its name so that's what we are calling the CGS reactor during the discussion today.

It's imperative that we move ahead at this point in time and say: We have very serious safety risks. The energy department, after two episodes of…on Sixty Minutes and numerous congressional investigations went back and said: For the nuclear chemical processing facility for nuclear waste, we have to increase the seismic stability of the facility to meet these new studies.

It is vital that this reactor, the CGS reactor, not operate when it can't meet the same standards that we have for the facilities all around it because relying on studies from the nineteen seventies is inadequate to protect the health and safety of the Northwest…and we're are talking about massive amounts of radioactivity

in terms of the spent fuel pool. We're talking about the amount of cesium-137 alone is…magnitudes more than was released at Chernobyl.

I was recently on a panel where the person who did the modeling for the Japanese government on cesium-137 and what would meet their standard for where they would allow people back in, I will conclude with this: he did the modeling for where they would allow residents to come back now after Fukushima and, based on cesium-137 alone, and during his discussion I did a little calculation and said to him when I followed, as I understand it you're saying that level of radiation from cesium where you're letting people back in would result in a 2% fatal cancer risk rate from just cesium in the soil, and he said, Yes. That's their standard. That's what happens after an accident. The spent fuel pool has twenty times more cesium in it than was released at Chernobyl. So with that I'd like to turn it over to the rest of my colleagues.

[Chuck Johnson (CJ) 35:20] Should I go ahead with the McCullough…brief introduction of McCullough? Ok…Alright…I'm gonna…My name is Chuck Johnson and as I said before I'm the director of the Joint Task Force on Nuclear Power for the Oregon and Washington Physicians for social responsibility.

I'm gonna briefly introduce the economic study that has been referred to, the Robert McCullough study that we…commissioned last year. It was completed in December of 2013. It's available on Amazon. It's entitled the…"Economic Analysis of the Columbia Generating Station."

And I like to pass some copies along to the panel members. This is also the Executive Summary…For ease of access, the Executive Summary is on top there.

There's an awful lot of information in this document. It includes history of the Washington Public Power Supply System…it includes ownership issues…it includes a variety of things.

But it's the most thorough economic analysis done in many years with…of the Columbia generating station with 30,000 stochastic runs of potential energy scenarios, featuring… factoring in hydroelectric variability, the renewable energy standard that will be required in the various states of the Northwest, the US Energy Information Agency's predictions on natural gas pricing, and the other variables that can be factored into the computer model.

I think you can look at this as a very high-definition snapshot of past performance of the CGS economically, with a current…with also a sharp… a very accurate view of the current outlook and… the outlook for the near term at least.

This is a conservative analysis in that Robert's findings actually were…he cut them in half because he published his final findings as splitting the difference between the predicted economic cost of what Energy Northwest had predicted it would cost to run the plant and what his model showed. So, actually, his model showed that is was double the cost; the 1.7 billion would actually be 3.4 billion.

He found that compared to market prices for the contracts available in the mid Columbia basin, the CGS had been losing money for Northwest rate payers for the last five years. And in 2012 it cost us two hundred million dollars.

You'll see on page 15 of this, that 18% of our current costs went for operating the Columbian generating station last year…the current cost of Bonneville Power Administration went for that.

The fact that it's not meeting the market is not too surprising; we have lower cost power here in the Northwest and this is a pattern of older coal and nuclear plants throughout the country that's playing out right now. Some of them are failing; the ones that have to meet market tests, unlike ours, are having to be closed down. A number of coal plants have closed down and a couple of nuclear plants have already closed down and others are under threat.

I ask you to look at the Kewaunee plant, which is mentioned in Robert's report, in Wisconsin, a perfectly functioning nuclear power plant that lost its fixed contracts and had to close because it couldn't find anyone to buy the power.

So, cheap wind and natural gas are the culprits that he finds here. Wind is very inexpensive to operate… it's built. Natural gas current prices is relatively cheap. And this dual factor is pounding the nuclear power industry throughout the United States and is true as well in the Northwest although it's not looked at except now because of Robert's report.

You'll also see in this report, if you dig down a little further, there is…he addresses the carbon impact of the CGS, because, obviously, if we're talking about replacing the power partially with natural gas, we're talking about a potential carbon impact. And I think some of the other panelists will talk about this as well.

He mentions that this particular plant has had particularly carbon-intensive fuel. By using the Paducah plant to produce it, it's actually been…uses ten times the amount of energy that's used by a modern fuel plant. And it was entirely, a hundred percent supplied by coal power in Kentucky.

McCullough argues that this is an excellent time to get out, as prices are low and the plant will only get more expensive to operate as it ages. And the costs…as will the costs of decommissioning and storing the waste. And he documents that as well in the report.

He suggests that Bonneville and Energy Northwest cooperate in 2015 to send out a request for proposals and see if the market would supply adequate power at a favorable price to replace the Columbia Generating Station. That's the recommendation of his report. And that's all I have to say on that topic. Thank you very much.

[Peggy Maze Johnson (PMJ) 41:33]

My name is Peggy Maze Johnson and I'm gonna go back forty… (chuckles) how many years…1972. I brought the summary and the final report from the Energy 1990 study which I served on. Actually, in this little document, I marked where my picture is to document that…indeed I was there…and I (chuckle) hardly recognize myself.

Let me tell you what happened. City Light was very involved in pushing for WPPSS 4 and 5, as were the PUDs around the state. It was very interesting because I was running a poverty program and because I was running a poverty program, I was trying to figure out why people were coming in to get food. Why did they need food? Well they had to pay their utility bills for one. So I got involved with the Central Seattle Community Council Federation and I chaired their utility rates committee. So I came before the Energy Committee of the Seattle City Council many times. One time we even came in with a coffin (chuckles) with "Rest In Peace" headstones saying City Light customer buried by inflation.

But I got named to choose a consultant to look at Seattle's energy needs for the next fifteen years and that was in 1975. After we chose the consultant, Gordon Vickery, who I was surprised, the Seattle City Light person didn't know who Gordon Vickery was, who was a legendary superintendent of Seattle City Light in those days. I told him I'm gonna come over and brief them on the history of City Light.

They asked us if we would sit…increase our committee. There were three of us on the selection committee…increase ourselves, grow ourselves, and check out the process. Oversee what was going on and we said yes. We all met with the City Council at Providence Heights, and our recommendation was not to go with WPPSS 4 and 5. And I have to tell you that the PUDs in the state did not like that very well.

But the City Council was bold and they moved forward and they said "no" to WPPSS 4 and 5. We didn't need it if we had a very strong, aggressive

conservation policy. And indeed 1990 came, we had not even met what they thought we would need in 1990 from the econometric models that were designed.

Seattle and the Seattle City Council took charge. And I guess what we're asking is for this council to look at that history and to be bold and to direct City Light instead of City Light directing you. And we think that that's really important, because you represent the rate payers that are customers of City Light and you need to make the decision of whether we take the risk and pay the costs of keeping CGS open.

And you know it's interesting when Gerry talks about WPPSS. Back in the day we used to go "whoops" (chuckles), because that was what happened. You know it was…I really do believe that that's why Energy Northwest changed their name to Energy Northwest to get away from that connotation.

It's… the risks we saw for WPPSS 4 and 5 back in 1975 were extreme. We knew that we did not have to have that…not only not…we didn't need it, but also we could not put people at risk by building those two plants. So, that's gonna be ending my portion of this and I want to thank you again for allowing us to have this briefing. We think it's very important that you hear all these people that are speaking.

I also want to pass around… the World Council of Churches has issued a statement against nuclear power. And I'd like for you all to read that because I think it's very important. Thank you so much. And I'll let you borrow these, but I need them back (laughter).

[Kshama Sawant (KS) 46:03]

We can't let you have them back. (chuckles) Thank you for speakers so far. And welcome subsequent speakers, but I also wanted to invite council members if they have any questions or comments, please join in. I also have several things to add, but we'll have everybody speak once and then we'll have a discussion. Who's next?

[Sara Patton (SP) 46:24]

I think I'm next. Yeah…the Northwest…Let's see if I…am I close enough now? ...

[KS]

Close…yeah…

[SP 46:32]

The Northwest Energy Coalition was organized in 1981 to help implement the Pacific Northwest Electric Power Planning and Conservation Act of 1980. The Federal legislation that many in the power community hoped was going to save Washington Power Public Supply System's five nuclear plants that they'd embarked on construction at that time.

As we've heard Washington Public Power Supply System is now known as Energy Northwest and the Columbia Generating Station is the only one of those five that was ever completed.

Suffice it to say that the coalition was interested in other parts of that statute and, specifically, the priority for energy efficiency and renewable energy for the Bonneville Power Administration. The emphasis on protection of…for consumers in low income households, and the promise of effective restoration of fish and wildlife that had been harmed by the power system.

And I want to stress that the Northwest Energy Coalition works for clean and affordable energy. Our member organizations include clean energy advocates but also low income advocates and we're very concerned about both aspects of the…our power supply and the future.

We're proud of the region's remarkable success in developing clean, affordable energy. The Northwest Power and Conservation Council, set up by this legislation way back when, reported this January that energy efficiency is now the second-largest energy resource in this region; at 5300 average megawatts. That's enough to power the entire state of Oregon. And the savings in 2012 came in at about 1.8 cents a kilowatt hour.

If you know about…that's very cheap. It's remarkably cheap. We've done an incredible job in making sure that that is our most important resource. And I want to say that the City of Seattle and Seattle City Light have been consistent and innovative leaders in this success. From energy codes for new construction, to utility incentives for energy efficiency to low-income weatherization programs. And Seattle City Light is one of the more than hundred member groups of the coalition. Lynn Best, the environmental director for Seattle City Light, is the elected chair of the Washington Caucus of my organization.

So I wanted to talk a little bit about *Energy 1990* as well. It gave, as Ms. Johnson just said, gave the mayor and city council the information and the analysis that they needed to decide not to participate in the fourth and fifth nuclear plants that WPPSS had embarked on.

That decision came in around 1975…76…in the 75-76 era. Instead, they instructed Seattle City Light to invest in energy efficiency and new renewable

generation to meet the expected demand through *Energy 1990*. So it was like a fifteen year horizon plan.

I was hired in January of 1978, a newly minted lawyer to help Seattle City Light with the legal and policy challenges of developing that energy efficiency as a full fledged energy resource. And I stuck with those challenges until I went to the coalition in 1993. Which is to say that the coalition and I have been working on alternatives to nuclear power for many years in productive partnership with Seattle and Seattle City Light.

Now, on to the Columbia Generating Station. We're not here…the coalition is not here to advocate for a particular position on CGS. Rather, we wanted to provide some context for how the nuclear plant fits into the power system and what other resources could replace it. The coalition's 2012 strategic plan calls for us to "oppose development of new nuclear power facilities and ensure that the problems associated with nuclear energy are presented when nuclear power is promoted as a useful or necessary response to climate change."

It's important to note a few key facts, and some of these have already come up, on nuclear power's minor role in the region. For the state of Washington's 2012 fuel mix, nuclear stood at 4.7 percent, as noted earlier from the fingertip facts; for Seattle City Light in 2012 it was 4.4 percent.

On a regional basis, in 2013 it was 3 percent on an energy basis; and on a capacity basis it was 2 percent. So while nuclear plants are considered base load resources because they don't ramp up and down very quickly, the region's utilities have regular and significant experience dealing with planned outages from the Columbia Generating Station.

It's refueled every two years. And during that refueling it's offline for about two months. Sometimes Energy Northwest decides to do additional maintenance work during that refueling and the plant can be offline for as much as four months.

Just recently, a couple of years ago, the spring freshet was so robust that the Bonneville Power Administration asked Energy Northwest to bring the plant down to 85% capacity to accommodate all the hydro and wind in the regional power system and that worked out fine.

During these refueling periods all the utilities that rely on the power use other resources. They plan for these outages either by purchasing other resources or by using their own resources in a different way.

That said, I'm going to review two solid analyses of the region's clean and affordable energy potential. First, it's important to look at the sixth power plan…power and conservation plan put together by the Northwest Power and

Conservation Council. It's a twenty year plan adopted in 2010 that establishes a regional load forecast and a portfolio of resources to meet demand over that period.

[KS 51:57]

This is from the coalition?

[SP]

No. This is from the Northwest Power and Conservation Council, a body that was put together as a part of the oversight of Bonneville and the regional power during the attempt to save WPPSS that didn't go well. It is eight members; two appointed by each of the four governors of the region. So it's not an advocacy organization…it is a politically appointed organization and the governors of Idaho and Montana have two members as well as Washington and Oregon.

And that plan they do every five years. The sixth plan is the most recent in 2010. It shows that the region can meet 85 percent of demand over that twenty year period with energy efficiency. The remaining 15 percent can be met with new renewables.

[KS 52:46]

Meaning 85 percent of the needs can be met without any new energy sources because it can be addressed by conservation…

[SP]

Energy efficiency…well we consider energy efficiency a new…but it's not new construction….

[KS]

No…Of course….of course….

[Bruce Amundson (BA) 52:58]

85 percent…85 percent of the increase.

[KS and SP]

Right.

[KS]

No I agree with you…but...Yes…Yeah…Yeah…No I understand that.

[SP]

Of the increase. Right. And really that 15 percent is for new renewables. Much as we like new renewables, certainly. Those are the required levels of renewables by the state of Oregon, the state of Washington, and the state of Montana in their renewable portfolio standards. We might well have been able to meet all of it with energy efficiency, but there are those legislative requirements for new renewables.

The plan identifies a high, medium, and low options for energy efficiency. All of them are cost effective. And the region's now achieving the medium case. That's the 5300 average megawatts that I told you; that's over the whole period of time. But, right now, for the last five years, the region has been meeting those medium goals.

And some conservation experts, including the coalition, think the region's undervaluing efficiency and we should be expanding delivery and program design to achieve those high targets.

[KS 54:02]

On the 15%, the guideline that you said all the four states have for 15% should be accounted for…renewable…is that…I'm assuming that's a minimum; at least 15% should be accounted. Is that the guideline?

[SP]

Oh yes. Yeah…I mean…You know the state of Washington and the state of Oregon both have what are called renewable portfolio standards, and those standards establish, in the state of Washington it's a slowly ratcheting up…15 percent by 2020. And Oregon is 20 percent by 2020. Montana's is a little looser than that. Idaho doesn't have one.

Meanwhile, all utility conservation potential assessments analyze three levels of savings usually: a technical potential, so if you got every single socket with a LED bulb in it, that's a technical potential; an economic potential which then brings in an avoided cost that you're trying to stay under…the cost of new generation usually; and then finally an achievable potential, which takes into account the fact that it's hard to get all of even the economic potential. Seattle City Light's integrated resources plan is no exception; it looks at those three levels.

Utility programs shoot for that achievable level. Yet the larger economic potential is cost effective and available. And we all think…we think that we need to think

outside the box to acquire more savings. Seattle…just to give you a sense from Seattle City Light's conservation potential, it shows an achievable potential. This is the lower level; at 9.7% of baseline in 2030…2023, excuse me.

It shows a much larger economic potential for that same year at 14.7%. So, once again it's not easy to get…achievability is what we've shown we can do with programs and codes and standards. Going beyond takes some more effort but, you know, it's achievable, so…it is potentially achievable.

The second analysis that I want to talk to you about is one that the Northwest Energy Coalition did conduct. We put it together; it's called *Bright Future*. We put it together in preparation for the sixth plan. It looks at a longer time horizon and it has more ambitious goals. Whereas the sixth plan looked at just meeting load growth, we looked in *Bright Future* at meeting load growth and we increased the load growth to account for…we didn't think that they had enough load growth in there for the electrification of transportation from electrical vehicles and transportation...so we put in more load.

We also looked at retiring all of the coal that now serves the region and 1100 average megawatts of hydroelectricity to give back to salmon and especially this…we were looking at the removal of the four Lower Snake River dams or other ways to give back water to the salmon. So….

[KS 56:56]

Do you have an estimate of how much of the energy is satisfied in the region…in the four-state region I guess…by coal and maybe natural gas or landfill gases in general?

[SP 57:11]

Well…I can't do landfill gas. The coal is actually…people are pretty shocked at the fact that we have as much coal in the region as we do. And it's in the…it has been…as high as 20%. It's going down because the Portland General Electric is, you know, is committed to…turning off the Boardman Plant and TransAlta to commit to turning of Centralia. So we see those resources are going down and we're also working with the owners of the Colstrip Plant that supplies a good deal of power to the state of Washington. So we see that going down.

What we were looking at, though, in terms of this study was bringing down by 1000 megawatts by 2020; we think we'll beat that so that's pretty exciting, and bringing an additional 5600 average megawatts down by 2025 which takes all of the…that would be all of the coal that serves the region. So we were looking at a bigger goal.

And we didn't look at the…retiring…the Columbia Generating Station, but, obviously, it's megawatts for megawatts and you can work through that. So I've got copies of a four page synopsis and the entire study for you. And I'm not going to go into the all the detail, but I'm happy to answer questions.

So we found the need in this…through 2050. So this is a (chuckles) long time horizon study. And then we looked at 2050 and 2020 so that we had a nearer term look as well. But through 2050, we're looking at the need for 25,600 average megawatts. Just to give you a sense of what that means, the region now…or in 2009 was at about 21,000. So it's more than doubling over that period of time. And, obviously, we were including the retirement of coal and the retirement of 1100 average megawatts of hydro in that need.

So to meet that load growth, including electrification of transportation by 2050 and to replace that 1100 and the 6500 average megawatts of coal. So then we looked at the clean and affordable power; and, once again, affordable is very important to us, to meet that 25,600 average megawatt challenge. We found, and this is…did I keep a copy for myself, probably not…of the…of this one…great…This is my favorite bar chart here. This up here, the blue…chart…bar is the 25,600 average megawatts that we need over that long time period. And this is what we found was available and what we considered to be clean and affordable energy.

81,118 average megawatts of clean power. Of that, 14,280 are energy efficiency at under four cents a kilowatt hour. 6200 average megawatts from combined heat and power under six cents a kilowatt hour. That's where usually an industrial facility puts in some generation so that it uses a waste heat for example to supply some of its power and then sometimes it will also sell some of it to its utility.

[KS 1:00:40]

I just…I just wanted to focus on this a little bit. This is…I wish Seattle channel would focus on this you know bring the camera on this. This is an incredible graph. It defies the conventional logic that we need nuclear power, we need natural gas, we need harmful sources because there isn't enough energy to go around and what you're showing…the graph is titled "affordable clean energy potential dwarfs need." So yeah please…please go on.

[SP 1:01:11]

Yes. And so, finally, the biggest (chuckles) element of that bottom graph is that 60,638 average megawatts from clean renewables under ten cents a kilowatt-hour. Now…right now, and I'm sure this is why Mr. McCullough used gas and market purchases, which is where the gas comes from as the replacement, gas has been fairly cheap lately. But, as we also know, the power system is littered

with people who bet on gas staying cheap forever and we all know that it's not clean.

[KS 1:01:46]

And it's…right…exactly…and we know it's cheap because fracking has literally exploded all around the country and that presents its own set of dangers to especially the local populations. Actually, on that…I wonder if I might just interrupt you for...one second. And draw everyone's attention to…I mean there's a lot written out there about environmental questions and there's a lot of confusion in people's minds I think justifiably because the people hear different things.

This…we'll put this article up on our council website…on my website. This is an article from September twenty fourth of last year from the New York Times which is titles "Is Natural Gas Clean" and clean is in quotes and the entire article deals with this question about…for those…assuming that the vast majority of the population, which it is, is convinced that climate change presents a horrendous prospect for the planet, how do we move away from fossil fuels, from coal burning…specifically coal burning, I think two of the most common source of confusion is that while nuclear is an alternat…is a clean alternative and natural gas is a clean alternative and so the economics obviously is…because fracking has explo…really exploded all around the country, the price of natural gas has plummeted. But if you look at the dangers…I mean I'll just quote bits from this article.

It says, "One reason natural gas is called clean" in quotes "is because it emits fifty percent less carbon dioxide than coal when you burn it. Thus it is seen by some as" again quote, unquote "bridge fuel until zero-carbon producing renewables can take over. But natural gas isn't clean in the way that solar is clean. It is just better than the worst. That's all" and given the climate change clock…the ecological clock that is ticking, I…I'm not an environmental scientist, but I know that environmental scientists basically have a consensus that that's not a real option.

And part of the logic is the dangers of natural gas…of methane itself…but part of the danger lies also in how fast that clock is ticking and can we use something that is somewhat better than coal, which is also releasing fossil fuels.

It says, "the situation of climate change itself is too dire to use a bridge fuel" now we do need urgently to move to renewable energy, "experts say we must stop adding carbon into the air within the next thirty years or face" what's called "a climate feedback loop in which" it will reach a point where "global warming will" continue "regardless of subsequent activities" and we have very, very little time before that point is reached. And so switching to…and then it says "if switching to

natural gas long delays the dominance of renewables," then "it's not doing much good" and "that's why action now is important."

And then it goes on to talk about why methane is so problematic. But please go on…yeah…

[SP 1:04:50]

What I wanted to really end with is that this…this analysis was completed in July 2009, so it's a little out of date, but the basics are still correct. We do have plenty of clean, affordable energy resources available to meet power needs and to retire existing generation as well.

What I wanted to say a little bit about is that the Northwest Power and Conservation Council in its sixth plan…It's working on its seventh plan now, which is very important to keep your (chuckles) eyes on because it's going to be very interesting analysis but…in its seventh plan it also looked at retiring…its main plan does not include retiring the coal or the…or any of the hydro for endangered salmon, but they did that analysis in and reported it in the appendix and I can give you more information on this, but what is really remarkable is that the magic of energy efficiency, especially when relying on it for 85 percent of the load growth, means that while your rates go up, compared to not replacing existing generation, because people are using so many fewer kilowatt hours, because of the energy efficiency…

[KS] Right

[SP]

That's spread across…the spectrum, you end up with a bill impact that…and this is the analysis that the council did…relied on gas for replacement so we would not agree with that. However, the bills were actually lower, even when you replace the coal and the hydro for salmon, than they are today. Now that's the remarkable piece that…and it's just because of energy efficiency…the magic of energy efficiency. If you reduce the number of kilowatt hours, then you can pay a higher cost per kilowatt hour and still have a lower bill and that's part of the affordability here. What I think is really important and the new…the seventh plan we are pretty sure…given assurances that it will have…meeting at least the Federal 111- D…sorry I'm getting into the trenches here, but the new carbon requirements in the baseline of that plan.

So it's going to be very interesting analysis coming up and helpful I think. And I think that City Light is also…*Energy 1990* was probably the first integrated resource plan ever and City Light does a remarkable job in its IRPs every round and…

[KS] Right

[SP]

It'll be modeling these resources and looking at replacing Columbia Generating Station, I'm sure, as part of that and that's going be a very good information for the council.

[KS 1:07:29]

Thank you. Just as a note on time. We have about ten minutes left on this item, we can extend it if necessary, but just want to let everybody know. Please.

[Michael O'Brien (MO) 1:07:39]

Question. What's the relationship between Bonneville Power Administration and Energy Northwest?

[SP]

A monopsony (laughter)…I learned this…

[KS] That's a good answer…

[SP] I learned this word. Bonneville is the only purchaser of the power from the Columbia Generating Station. So there in a pretty close relationship and Steve Wright, who was the administrator for many years at Bonneville, now at Chelan PUD, went around the region for a year pointing out that Bonneville was paying in terms of operations and maintenance for the Columbia Generating Station more per year than it was paying for the entire remainder of the federal power system. In other words, Grand Coulee, the Dalles, I mean all of those…O and M for…and they were pu…he was then pushing hard for Energy Northwest to clean up its act, which it has done…has begun to do in just that level of not taking care of operations and maintenance, but that…to give you a sense, that's the relationship, they have to buy all of it.

[MO (1:08:49)]

They're required to buy it.

[SP] Basically yeah. And that's how we end up in the city of Seattle with…via the power that Seattle buys from BPA.

[Chuck Johnson 1:08:58]

And I could refer you also to page 56 of the McCullough's report, the Governance and Ownership section. You can see there's a very helpful Venn Diagram there. It talks about ownership issues on page 57. Seattle City Light's right in the center of it, it's in all three of these. The CGS participants, the 92 owners, the original investors in the WPPSS number 2 plant, get to vote on an annual basis as to whether or not…on the budget of the Columbia Generating Station and Seattle City Light has a 7.65 percent share as a CGS participant and could participate in those meetings.

It's also a member of Energy Northwest which is the operator formerly known as WPPSS and that's 27…it's a chartered corporation in Washington…27 publicly-owned utilities that run the plant and also have to approve its budget annually. And then it's also a member of the Public Power Council, which gets a sneak peek on an annual basis of what the budget of the Columbia Generating Station will be and gets to comment both to Bonneville and also to Energy Northwest. It doesn't get to vote, but does get to weigh in on decisions made regarding that plant. So those are three ways that Seattle City Light can participate in the decision of whether or not to continue to operate the plant, potentially if enough votes were found.

[KS 1:10:28] Thank you. I just wanted to drive everybody's attention, we have the graph that we were looking at earlier that shows that…the potential for affordable clean energy and using efficiency is actually quite…dominates over the increased needs.

Our next speakers…Council-member Clark, yes…

[Sally Clark (SC) 1:10:55]

Sorry. I know we are starting to run short on time. I apologize. So, this interplay between Sara, what you were just discussing and the economic evaluation and in…while we're doing this I can use the iPad to go to Energy Northwest's website and see what they're saying as well.

And they're saying well we also had this independent commission the Cambridge something…the Cambridge Energy Research Associates independent study and the Public Power Council and both of those have said oh, this is the best value for rate payers.

And is that because of using gas as the comparator…is that sort of the nut of the problem, that if you use gas as part of the comparator, you're going to end up with a particular outcome?

[SP 1:11:39] Well typically, Energy Northwest ignores the sunk costs in the power. So they just…

[SC] Ok. And that would be kind of a big deal…Yeah…

[SP] Yeah. It's as though you've ignored your mortgage…

[SC] Right…

[SP] In your …and just use your O and M….yeah….

[SC] So when they ignore the sunk costs…I mean so….

[SP] Not that we can get out of them…we can't…but, you know…

[SC] And so the economists would say…I don't know that all the economists would, but the economists would say those costs are out the door, you can't look at those going forward.

[SP] Right…

[SC] Which, for the common person is a little weird, because I'm not a fan of nuclear energy. I…For all these technical reasons, it's great. But, mostly, I just hate that we don't know where we're going to store the stuff when we're done with the rods.

And so that…not looking at the sunk costs does seem like it's a big deal in addition to using gas as the comparator…and so you get all these competing studies about, oh no, you know this is the best deal for the rate payers and I think for regular people they're just trying to figure out…what did you included in your study and what did you hide. And I shouldn't say hide, although…

[KS 1:12:35]

But the conclusions the studies reach do depend on what assumptions they're making, so if they're comparing it to, say the significantly lowered costs of gas production, then…yeah…it may be…I mean I'm not…I'm not sure if it does, but that might make sense. But it doesn't make sense from an environmental or overall standpoint.

[CJ 1:12:48]

I think that also you can see McCullough's response to the Cambridge Energy Research Associates' study in the Appendix C, "Review of the CERA Study." And it starts on page 306 of this report. So you…basically, they assume that you replace the Columbia Generating Station with a single natural gas plant based at Hanford…

[KS] Yeah. Second gas plant….yeah.

[CJ] It didn't take account any displacement from wind…existing wind generation. There were a lot of assumptions in there that don't seem to be valid. The cost of the gas plan also was assumed to be more expensive than a gas plant that Energy Northwest, itself, had proposed. So they selected…it was cherry picked in our opinion but, you know, you can judge for yourself, obviously.

[Gerry Pollet (GP) 1:13:39]

I'd also point out that the…what we're paying for CGS is a little under five cents per kilowatt hour. Sara just testified that we've just…last year's data is for each kilowatt-hour of conservation we achieved it at 1.8 cents. That's one third the cost of operating CGS.

[KS] Right…

[BA 1:14:05] It also pushes down the road the decommissioning costs for the plant…

[KS] That's a really good point yeah…

[BA] And decommissioning costs for plants are staggering, and they are escalating each year as more plants are decommissioned. So it's sort of ignores that whole issue.

[MO] It would seem like the decommissioning cost is actually a current cost that's being deferred and for accounting purposes that should be amortized over the life of it….

[BA] You would think but not…

[KS and SC] Yes…

[KS] If it was any other cost it would…yeah…

[SP] Like planning ahead…

[BA] Any more than the dealing with the spent fuel in the waste stream is not factored into the cost…which is why this is so crazy…

[SC] And that should totally be factored in…yeah…

[GP] So we don't have a fully burdened lifetime cost here. But we also know that at the cheap end, we're going to be spending tens of millions of dollars on mandated Fukushima related upgrades to this reactor. Now is the time to avoid that cost. Because we're talking high expense and that's without trying to deal

with the things we've discussed here today in terms of the spent fuel pool et cetera. In just the venting alone, we're talking quite a big investment.

[PMJ 1:15:16] I'd like to also…when you talked about climate change, I'd like to add that, there's a lot of people…and I believe a lot from the nuclear industry, which I've heard from, are saying that in order to get rid of coal, we need nuclear and…there's some, unfortunately, some environmental groups that are buying that. And I think it's really important to understand that we're not looking at that and I think we have to stop saying it's either or; it's neither.

[KS] That's very important. And I think the same applies to things like natural gas as well. It's not either coal or natural gas; it's neither. We gotta look at…

[PMJ] Well we were a model here in the country on conservation. And I think that we need to start going back to conservation it should be at the top of our list of our energy needs.

[KS] Please go ahead.

[Dave Gurlick (DG) 1:16:18]

Hello. I'm Dave Gurlick. I'm with the Sierra Club Energy Committee. Not so much to add, the Sierra Club is an organizational member of Northwest Energy Coalition and our logo is on the same page. We're on the same page as far as the importance…Just as in real estate the three most important factors are location, in terms of energy it's efficiency and you just do efficiency, and then you do efficiency, and then you do efficiency. So this is the thing.

So one needs to fine tune the economics in the sense of a replacement. Because at the moment…when talking about substitutes, there's a zero carbon tax and there really should be more. So you need to count that in terms of making a reasonable economic comparison and…surprise, surprise...efficiency comes out best there.

So…now regarding the Columbia Generating Station, the Sierra Club passed a resolution in the Washington State Chapter that is very similar to what Physicians for Social Responsibility passed. We have a copy of that for the record.

The…now the one thing that the Sierra Club did not do was say we must close it down now. Organizationally, we are committed to getting rid of coal first and foremost. That seems to be the most time critical thing to do. There are, however, things that could be done at Columbia short of closing it down completely, much of which you have to do anyway. One of which is dealing with the leaky pool or pools subject to seismic leaks.

Operational issues like that…also one that is not brought up too much is the danger of fire. Just ordinary fire at a nuclear plant could disrupt things and cause all manner of accidents. So operational issues like this…and…close down or no, we have to deal with waste, no matter what.

The ideology that you could just sort of dispose of waste is not a good one. Waste is around for centuries and you have to keep track of it and make sure that it's not doing anything that you don't want it to do. So not particularly this idea of drilling a hole in the mountain and putting it there and hoping that it's going to stay there for centuries isn't a really good way to do it. You really need to keep track of it; to warehouse it essentially and…

But the main…short term operational thing is whatever can be taken out of leaky pools and put into dry casks, do that right away. It just reduces the seismic risk enormously.

So I think we would emphasize the operational things and this is where City Light would have some influence, perhaps, as a board member on reforming the operations beyond what they've already done.

[KS 1:19:27] And I just wanted to include…maybe Brian is going to address this, we just also made this available to the audience, the resolution that was passed by the Washington State…if you want to talk about that…what Sierra Club did.

[Brian Grunkemeyer (BG) 1:19:38]

Yes. We actually got that draft in conjunction with members of the Sierra Club and also the Physicians for Social Responsibility and, if the Seattle City Council would like to adopt a similar resolution, feel free to use that language (chuckles). We're trying to make your lives just a little bit easier. So…

[KS] It's appreciated…

[BG] Yes. I'd like to emphasize, everything that we've been talking about here…conservation has been the most cost effective way to reduce our load and to reduce any of the risks that we're talking about…about future fuel costs, or anything along those lines. Conservation, in terms of investing in our existing buildings and doing simple things like insulation is really the cheapest thing.

But, I want to talk with you about one other thing that no one's been bringing up yet. I want to talk about a duck (chuckles). So, in particular, the California Independent Systems Operator, who runs the electric grid, has come up with something called a duck chart, where they're looking at the power supply for California in the next ten years.

In this chart, in the middle of the day, they are getting an increasing amounts of

their power from solar. As you know, residential solar is exploding in California. We've had really, really good policies at the state level. But, beyond that, Wall Street is actually helping out through the form of securitization.

The idea of third-party leasing is allowing solar to truly expand at a phenomenal rate. It's essentially dropping a Wall Street money bomb on the solar industry and that has enormous impacts on California's electric grid.

For them, they look at having eight extra gigawatts of power available during the day from solar. You might wonder, how does that affect us in this state? Well, the answer is really simple if you look at what the Bonneville Power Administration does with power during the day.

We generate somewhere around four to twelve gigawatts of power throughout the year that we export to California to go meet their needs. That's great! We have cheap hydroelectric and it's probably offsetting some sort of natural gas in California.

However, the rise of solar in California over the next five years, is going to reduce the needs for power imports from Washington state. The Bonneville Power Administration will have some amount of new power available for sale to Seattle City Light or to other utilities in the region. We can use this to replace the coal plants in our region that are retiring and also to retire this nuclear plant.

So, when people ask whether this makes sense, you've got two different answers: You got the incredibly well thought out, well researched position that the Northwest Energy Coalition has and you also have the facts on the ground of what's going on in the California solar industry.

I would love if Washington's solar industry could take off as well, but there's some problems at the state level there that are preventing that from expanding.

[DG 1:23:09] There's another factor in that California's solar is meeting a summer peaking demand for air conditioning and in the winter time, they don't need it as much and they can…We're winter peaking here and we can buy it from California over the West Coast Intertie rather than firing up gas plants and that's something that we should certainly do.

[KS] That's a very, very good point. I'm glad you mentioned that…

[BG] So the key things here that our region needs are, ideally, more renewable power, but we also need energy storage. So there's several different ways to store energy. Hydroelectric dams are first and foremost the primary way to do that. You can, to an extent, you can kind of operate a river like a battery, and without harming salmon too much, ideally. There's a way to make that work and the Bonneville Power Administration does it already.

However, there's some other things that are also on the verge of becoming cost effective as well. In Puget Sound Energy's integrated resource plan, they seriously looked at using electric batteries in individual neighborhoods, to meet some of their peaking capacity needs and also to lower some of the costs of expanding out the grid in areas where, otherwise…where they're right on the edge of needing to pay for that expansion now.

So you can use energy storage, even in the neighborhood level, to reduce your O and M cost increases, in addition to preventing some of your need to build new peaking capacity. So flexibility in those forms is an amazingly useful thing for the region and if Seattle City Light wanted to look into a pilot project, that's probably a good idea. (Chuckles)…

[SC] We need a duck (chuckles)…

[KS] We need a…pilot project duck…

[PMJ 1:25:12] I'd like to make a comment. I had the honor and opportunity to go to Chernobyl in 2006 on the twentieth anniversary of that blast. They took us out in a bus…our conference was actually in Kiev. It was a world conference, and they took us in a bus out to Chernobyl where the plants were and on the outside of the front window of the bus they had a dosimeter, which marks how much radiation is still around.

It was 1800 REMs and I'm gonna tell you that's a heck of a lot more than is safe for our bodies and the workers can only go in there for a certain number of hours a day and they can only go out every six weeks, because…and that's wearing RAD suits and protective gear. I mean it's…if there is a blast, at CGS or at any of the parts of Hanford that are storing all that waste, there is a chart that shows the plume would be greater than Chernobyl and when they talk about downwind, that doesn't mean down south. Downwind can be everywhere, which we learned from the Nevada test site. Utah is north of Nevada and they are down-winders and it's a scary thought and what happens to people from radiation is very scary and I think that we need to be pulling ourselves away from it as soon as possible.

[Someone laughs, audience claps]

[Someone from the audience] I'm in Chernobyl in eighty six…

[GP 1:27:06] I'd like to conclude, then by urging the Energy Committee and the full council to direct the city and City Light to use its position on the Energy Northwest Board and WPPSS and WNP-2 participants' board, to simply go ahead and say we want you to introduce a resolution and to get other support from other utilities to follow up on Robert McCullough's report and review…put out the RFP, request for proposals for replacement power conjunction with

Bonneville and ask can we simply replace the power at less cost and for City Light to proceed with its planning on that basis and its investment in conservation efficiencies and renewables as part of that plan.

[KS] Ted, did you wanna add something?

[Ted Virdone 1:28:13] Yeah, that's a great idea. I also just wanted to come in…in a more general sense that a lot of times we look at this and we look the cost to rate payers and it shouldn't just…it shouldn't be rate payers that have to…if it is more expensive to do things in a way that is not gonna destroy the environment and the world that we live in, it shouldn't be rate payers that have to pay for. It should be the huge forces in this world that have caused the environmental destruction for so long.

[KS] Right, and so I was, just in closing, I was wondering…first of all if you haven't done so already, all the speakers and all the organizations that you represent, can you send us the written material that you've referred to…all of it so we can put it all on our website so people have access to it?

And also Sara your statement…I think that would be extremely useful to have. And…I'm assuming there's an online version of the Bright Future report…

[SP] Yes. I'll send the links…

[KS] Right. I really thank everybody from the panel who came here. It was really a unique opportunity for us to have everybody…I mean it's really difficult to coordinate calendars and you have no idea how much I appreciate everybody being available. Some of you had very short notice, especially Sierra Club so I am grateful that you're here.

I also wanted to note that this resolution is very recent that you…it's an interesting coincidence that we were gonna be talking about this and this happened and so we were very happy to be able to include this resolution as part of the discussion from Sierra Club.

I also wanted to thank everybody who commented during the public comment. Also, I think we also heard from a nuclear engineer who said we shouldn't reject nuclear power and that the Fukushima and Chernobyl incidents were sensationalized and I think we are to look at this from a very rational perspective.

The likelihood of that scale of disaster happening on a given day may be low, but the scale of that disaster, if it were to happen, the catastrophe that would happen is very high, if it did happen and I think the…we have to look at this from the standpoint of economic logic…why is it that human society would subject itself, people in the northwest would subject themselves to even a potential of that kind of disaster if we had other alternatives, and I think the fact that, as Gerry said

citizen activists are taking the lead on this is itself making it clear that we are not going to see that lead from corporations. We are not going to see that lead from the owner of the nuclear reactor. Obviously, we have to take the lead as you all have, as Heart of America has.

And, I think the point also needs to be made that often the question arises, of what happens to the workers? This is obviously not a…shutting down a nuclear power plant or shutting down coal mines is not…should be…is not against the workers who work there so we need a just transition for all the workers into other jobs and I have no doubt in mind that, as an economist I'm not a nuclear engineer but I have no doubt in my mind that nuclear engineers with their skills can transition to other environmentally and socially useful…whatever…tasks that can be done and also it really raises the question of mass transit. If we're talking about conservation and efficiency, I think that conversation is incomplete without discussing mass transit and how…if we had a really good mass transit system that people could rely on, without having to own cars, that would be something that would really make a big dent.

And also the question of rate payers is important. I thought Sara outlined some really interesting facts for us and also estimates about what studies have shown about the impact on the bill that the overall number of units consumed becoming lower because of really aggressive efficiency implies that even if the per unit costs go up maybe bills may be lower.

But I also wanted to emphasize that this…and this came up in the public utility discussion, this conundrum…where we are encouraging Seattle residents towards conservation, which is a good thing, but there's this question we face that the baseline infrastructure costs don't go away and if we base all the funding of our utilities on rate payers, then it is inevitable that even despite conservation you will see that rates…overall how much people are paying are going up and so ultimately it also points towards other…the need for other sources of revenue and not depending directly on rate payers on ordinary households, and it does bring the question of progressive taxation and taxing the wealthy and so on, and I think that also has to be part of our discussion.

But I'm really happy that we had this discussion, I hope everybody felt like we had a good discussion. Obviously, one discussion is not enough. But I'm also glad that we had some specific proposals that were laid out; what the city should be doing, what City Light should be recommended to be doing and I also appreciate some of the timeline that was given about what City Light has been doing and all the excellent work that has gone on and how Seattle really is showing the leadership towards conservation and renewable energy.

Thank you all…