Energizing the NW, Today & Tomorrow
September 28-29, 2004

Highlights
These notes reflect highlights and themes captured at the conference. It is a compilation of the work of several note-takers and is provided for informational purposes only. They are not intended to serve as official documentation of the conference proceedings.

OPENING SESSION, Tuesday, September 28

Susan Anderson, Portland Office of Sustainability
Emphasized that Portland is a showcase of sustainability and intends to remain so. It has the highest recycling rate in the nation. It (city government) is initiating an effort meet all its energy needs with wind power – that's 10 megawatts of wind farms.

Steve Wright, Bonneville Power Administration
Described that he sees the conference as an opportunity to "advance energy policy" in two areas: (1) transmission adequacy standards, and (2) energy efficiency and non-construction alternatives. He stated the need for a "holistic approach" including energy efficiency, pricing strategy and distributed resources.

Wright talked about how BPA and the region have progressed in achieving the goals posited at the Conservation or Crisis conference three years ago. Those goals were: (1) sustain our commitment to conservation – "get off the roller coaster;" (2) agree on a set of mechanisms to achieve conservation; (3) have all constituents pick up their share of the responsibility. BPA and its customer utilities have acquired 50 average megawatts per year for the last three years. The Natural Resource Defense Council recently recognized BPA as one of the most progressive utilities in the nation.

Wright issued two challenges: (1) by the end of 2005, develop transmission adequacy standards that have widespread support; and (2) establish non-construction alternatives for two transmission projects currently in BPA's budget.

Mark Dodson, Northwest Natural
Northwest Natural cooperated with other organizations to develop, and co-sponsor the Conservation Tariff. The Oregon Public Utilities Commission approved it in October of 2002. He said that this approach to rate design removes the disincentive to promote conservation of natural gas. It aligns the interests of customers who want low rates and shareholders who want a return on investment. The Edison Electric Institute, the American Gas Association and the Natural Resources Defense Council are now advocating this approach nationally. Northwest Natural has also voluntarily agreed to collect the public purpose charge that is required of investor-owned electric utilities in Oregon.

Northwest Natural advocates the "wise and efficient use of energy," otherwise referred to as the "right energy source for the right use." From that perspective it makes sense to convert the

100,000 electric water heaters in the region to natural gas. It is more efficient to burn natural gas in a water heater than fossil fuels in a power plant.

Joseph Desmond, California Resource Agency

The number one priority in California is "resource adequacy." According to Desmond, California is not yet "out of the woods" in terms of meeting its energy needs without crisis. The governor recognizes that California is not an island and needs to consider the whole west in its endeavors. California's energy policy is comprehensive and aggressive.

He discussed how in the area of transmission, California is "pursuing all opportunities." 2700 MW of transmission capacity are coming on line this year. Energy procurements are prioritized as follows: (1) energy efficiency, (2) demand response, (3) renewables, and (4) fossil fueled alternatives. Natural gas supplies will be augmented through: (1) increasing in-state production, (2) pipeline expansion, and (3) on and offshore liquefied natural gas. Solar energy is being encouraged through California's "million solar systems" initiative. The 20 percent renewable energy supply goal is being moved up from 2017 to 2010.

General session #1

Transmission and the Power System

Panel:
Marsha Smith (moderator), Idaho Public Utilities
Jim Fama, Edison Electric Institute
Louise McCarren, Western Electricity Coordinating Council
Rich Cowart, Regulatory Assistance Project
Ken Peterson, Powerex

Marsha Smith introduced this panel and outlined elements of an approach to mitigate transmission inadequacy. Elements to conduct a thorough adequacy assessment included recognition that it's more than a one-step process and that a resource assessment needs to occur on a regional basis. In this case, that means the western interconnection.

Jim Fama focused his presentation on the question, "Are we building enough transmission?" His presentation illustrated that the gap between peak and transmission is closing. However, he notes that the data is not a good indicator of transmission investment. It can be difficult to compare since many projects are short duration and tend to resolve local reliability, or new generation interconnect issues. In addition, most of the data is based on miles, and does not provide enough detail for a drill-down analysis.

Fama went on to outline the impacts of regional state committees. Though this is a positive element, his preliminary recommendation is that states should take RTO [regional transmission organization] plans into account. He also found that state policies vary significantly for regulation and approvals of transmission lines.

Fama pressed on many other factors that influence transmission. He outlined the impacts of DOE Designation of National Interest (security, economic etc.) and felt this was not the way to proceed. He believes regional state committees should be focused on siting first and foremost. He recommends that all transmission line models should be supported. He would like to see

FERC give more certainty, not less. And of course, that cost recovery looms large for the industry.

Louise McCarren began her presentation by stating her remarks were not official comments of the WECC. That said, generation, demand-side management and fuel supply all come together in any transmission adequacy assessment. She emphasized the need to harmonize loads versus resources. Transmission adequacy must include a west side regional assessment to understand the physical characteristics of the systems. It must also include resource adequacy criteria and a more sophisticated view of reserves beyond the 15 percent.

To do this McCarren went on to say it would require clear operating criteria, operation oversight, and enforcement. She believes institutional changes are likely. Transmission siting requires need and political will. Transmission will require multi-state efforts for all the states and provinces to "win." Along the way, states and WECC could cross each other on criteria. She asked how transmission costs will be recovered when the mix is always changing. Transmission is a rate base/rate-of-return decision but it has a direct effect on markets.

Rich Cowart believes things are not pretty in the power sector and in so many words believes we are the reason this situation is so ugly. The fundamental question is what kind of system do we want to build for the future? He said that the role of transmission policy should reflect the future we want. "Are we using the transmission tool to build the future system that we need to build?"

Supply side advocates say we need $50-100 billion in generation investment and that we don't know how much transmission we need. He reminded attendees that consumers don't purchase transmission and that electricity is a service with substitutes. There are alternatives. Advanced electronics, power management, distributed generation, customer sited efficiency, load control, and distributed generation.

How you decide to pay for transmission will have big affect on what you do. And closely connected to this is the need to reform how to pay for these investments and that price tag for reliability is slowly growing. Cowart said that over-investing would lower the value of demand-side management (DSM) resources closer to the load centers. Look at other states to see what they do and justify that to make your own decisions. We have a system that does not treat transmission fairly with other resources. Cowart believes the geographic scope of the grid is important. But that overlooks how power resources can be made more reliable. Depth and breadth are crucial.

Ken Peterson began by talking about how we build transmission to take into account regional fuel diversity. The West is still living off the back of the fundamental infrastructure developed at that time (60s and 70s) and the resources available at that time. The system we have was built on the backs of the past needs. Those needs change and increase. Responding to those needs requires considerable will.

How do we decide what to do? Adequacy includes many attributes to serve the load.

The level of transactions is much higher, and some think a threat to reliability. What is the safe zone to operate in? There are always economy exchange opportunities product offerings. Peterson warned, "Don't overlook role of pricing mechanisms, particularly in the short term." Use planning to spread benefits to all the consumers impacted. We should have one entity to do planning. Powerex is a strong supporter of Grid West.

Concurrent Session #1
Transmission Adequacy

Panel:
Louise McCarren (moderator), Western Electricity Coordination Council
Leesa Nayudu, Sempra Energy Resources
Frank Afranji, Portland General Electric
Don Furman, PacifiCorp
Bob Rowe, Montana State Public Utility Commission

Louise McCarren began by posing the question, "How are we going to find a cost recovery mechanism to fund these projects?" Her response was that bulk transmission service needs to be postage stamped. Between panel presentations, McCarren described cost recovery and siting as the Holy Grail.

Leesa Nayudu emphasized that focusing on adequacy and collaborating with others beyond your own region is required. She underscores this by noting that the potential harm to consumers for underinvestment is far greater than the harm of over investment. She laid out issues to resolve in order to move forward with this work. It included load pockets, price differential, non-economic dispatch issues, and lack of consistent methodology, and finally the lack of system to apply capacity for reserves.

Transmission infrastructure could last 30 to 50 years but it takes tens of years or more for the permitting process. Nayudu pointed out that she is impressed with how the Pacific Northwest transmission systems are operated and how we can operate on a region-wide basis. She noted how transmission patterns shift and believes that it is not fair for generators to cover all transmission costs. We don't use the transmission because we deliver to the bus bar. Additional transmission that could be built isn't because of the inability to pay for it. She believes transmission is a public good and suggests a transmission project investment discount rate of three to five percent.

Frank Afranji began with a cliff notes to transmission expansion history. There has been no transmission built in recent history. Transmission used to be built by vertically integrated companies and could build capacity beyond their needs. What changed? The 1992 Power Act, and FERC orders 888, 889 changed everything.

It increased uncertainty and no one knew who was responsible or who would be the beneficiary of transmission expansion. Everyone thought the other entity should be responsible. There opened a chasm between federal and state entities on who has jurisdiction. Regulation doesn't fit the size of the problem (the "Goldie Locks syndrome") everything is either too big (FERC) or too small (states).

On cost recovery, FERC moves at glacial pace on recognizing increased risk. They still want to use the old models. They need to start looking performance-based rates. You have to do a bit more to earn the rate. If FERC budges with the rate increase, the states seem to just take it away even though states cannot deal the whole problem.

We need an entity in the West with the help of other entities (FERC, states, other).
The proposal: involve everyone. With help of CREPC [Committee on Regional Electric Power Cooperation] and all the entities in adequacy planning, give us something to point too, not something that is theoretical. Call it the western policy council. Get everyone in one room to resolve issues.

Bob Rowe offered a state perspective and named it four funerals and a wedding? We agree there are problems, but we fight over jurisdiction, and who pays. We see increasing role of independent power producers, yet no obligation to serve. Meanwhile operators say their job is getting tougher and there is nothing to adequately address needs such as reactive power. Non-wires solutions are valuable but that is just one part of solution.

We need a coordinated approach. There seems to be underinvestment in transmission alternatives and a mismatch between generation and transmission systems. Rowe notes that traditional tools are still important and still there, but there is a mismatch between regional and state issues and jurisdiction. In closing Rowe asks, "Is there another way?" Yes, there has to be. Somehow we must recognize all the jurisdictions, benefits, and costs. He also reminded attendees that no control area is an island.

Don Furman reasoned that the only reason to create an RTO is for customer benefit. You must deliver a more reliable, low product cost, or you will lose customers. Furman rhetorically asked if congestion is good for customers. The answer is NO. It creates volatility, increases costs. Then, if everyone plans and operates their systems independently will we reduce congestion? The answer is NO. In so many words, Furman suggested that what we have is a tragedy of the commons. You have to plan or you get less than optimal system. Unless you plan, you are foreclosing resource options for your consumers.

We do not have the political will to solve this problem right now. We continue to require more electricity and that means more generation. This is the same problem we had five years ago. At the end of the day, everyone's transmission investments go into the rate base. We have many organizations working on this, but are they at a point to enable us to move forward? The answer is NO. How many people think Grid West is going to work? [Not many hands.] How many people think if Grid West does work that we should do something? [Lots of hands.]

Concurrent Session #1
Energy Efficiency Programs and Policy

Panel:
Dan Waintroob (moderator), Aspen Systems Corp.
Mike Grainey, Oregon Dept. of Energy
Tony Usibelli, Washington Dept. of Community, Trade and Economic Development
Tim Stout, National Grid USA (Formerly New England Electric)
Derek Henriques, BC Hydro

Dan Waintroob introduced that panel discussion by highlighting that the key is how we do energy efficiency in terms of balance and execution. We have to talk in the language of the people – jobs, etc.

Mike Grainey talked about how policy makes a difference. Past state energy policy has left hundreds of millions of dollars still in the hands of Oregonians. National vehicle efficiency standards reduced oil imports by 20 percent.

Grainey made several policy points relating to renewables. BPA should keep its conservation and renewable discount. The Power Council Plan suggests a need for a diverse energy supply, including hydro, wind, biomass and geothermal. Fossil fuels are problematic, but renewables have local environment also. Transmission policy is a driving force for renewables, like hydro policy drove transmission fifty years ago.

Tony Usibelli said, "Energy efficiency is the resource of the future." The State of Washington achieves energy efficiency without state government financial incentives. The four policy drivers for energy efficiency in Washington are: (1) The Regional Council Plan – "the cornerstone;" (2) the West Coast Governors Plan – to address Global Warming; (3) the State of Washington Energy Strategy – using an "integrated utility model;" and (4) (individual) utility integrated resource plans – least cost planning. Policy tools include: codes, efficiency standards, encouraging private sector support through energy performance contracting, executive orders, and life cycle cost analysis (using LEEDS) for schools.

Tim Stout provided long-term insights into energy efficiency. While there has been regulatory commitment to energy efficiency since 1987, new regulators always need to be educated. There are always new technologies (e.g., lighting) and higher standards (e.g., work of New Building Institute) to be embraced. "There will never be an end to opportunities to achieve more energy efficiency." Instead of an ephemeral "exit strategy" for market transformation, Stout sees a nominal sequence of follow-through activities, including local utility programs, regional programs, and efficiency standards.

Derek Henriques said that based on long-term experience with BC Hydro's Power Smart program, he offered several guidelines for energy efficiency program success. Establish a policy framework. Find out where the opportunities are. Bundle and brand programs. Share the risk between all parties. Use integrated energy planning. Think of demand-side management as a long-term commitment – it requires relationship building and maintenance. Use a combination of energy efficiency acquisition and transformation strategies – "backstop programs with regulations and codes."

General Session Panel #2

Non-Wires Solutions Round Table Panel

Panel:
Brian Silverstein (moderator), Bonneville Power Administration
Ken Canon, Industrial Customers of Northwest Utilities
Tom Foley, Energy and Environmental Economics
Sue McLain, Puget Sound Energy
Ellen Petrill, Electricity Innovation Institute

Brian Silverstein introduced the session with a remark about the need to expand our toolkit in transmission. Because if the only tool we have in our kit is a hammer, than the only solution will be a nail.

Tom Foley stated that any action that is not more poles and wires is a non-transmission solution. The region as a whole has had a lot of requests on the demand side since the 1970's with little energy efficiency or distributed generation. Non-wires solutions are now here to bridge that gap.

Foley developed a paper in 2002 that recommended changing the planning process for transmission planners. It recommended that BPA take each of the G-20 projects through the E-3 analysis (testing criteria to see if a transmission project could be solved by a non-wires solutions). It also recommended transparency in the forecasting function by sharing information.

Foley highlighted key benefits of NWS: deferral of large financial investments and construction impacts, leading to more economic activity in the region, while providing congestion relief immediately. He also noted opportunities: more emphasis on price signals; transparency in the planning process; further discussion of who benefits/who pays and transmission generation problems.

Ellen Petrill described Distributed Energy Regulation. DER is a subsidiary of public and private partnership looking for "win-win" solutions for all parties. They do this by having the stakeholders work this out. Working with Southern California Edison to develop a RFP regarding a distributed generation project/pilot. The bidders want to see a ceiling piece. They are making progress by getting people to sit down and work together. Petrill believes DER could be an alternative. Get the stakeholders together and find win-win solutions.

Sue McLain began with a statement that Puget Sound Energy is a gas and electric utility. Non-wires for us means looking at each solution thoroughly and the impact for our customers. In her territory, they experienced a serious growth and the system is beginning to see capacity. Being in charge of operations, we need to discuss the issue of who pays. Who benefits is paramount. McLain hears two things: low price and reliability. A non-wires solution as a low cost alternative and providing reliable service is a successful solution. I'm hopeful through the pilots we'll locate new tools to use in our toolbox. McLain emphasized, "First we need to make sure we meet the customers' needs, reliability and low cost."

Ken Cannon, who works for an industrial trade organization, said they approach non-wires solutions from an industrial perspective. We expect a greater degree of certainty to supply

generation supply. I make sure we look at robust solutions. A pulp and paper mill cannot afford a loss of reliability. It would mean millions of dollars lost.

Industries have a long history of participating in efficiency programs in the Northwest. Industries are familiar with distributed generation and many have combined heat and power. We are looking to hook up industries to back-up generations as a peak demand solution. The solutions must be reliable when called upon and must be cost effective for participants.

Inside the Minds

Panel:
Jesse Berst, (moderator) The Center for Smart Energy
Steve Klein, Tacoma Power
Alison Silverstein, Independent Consultant

Jesse Berst presented Steve Klein and Alison Silverstein as stars of the energy industry and invited them, and attendees in a dialog on energy policy, and their envisioned energy future. Berst provided the discussion topics (in bold). These notes paraphrase and summarize the discussion.

What is the most important point of the conference made so far?

- Silverstein: It's about benefiting the customer. If it doesn't benefit the customer, you shouldn't do it. The best and most effective transmission plans will be spread across the region so that everyone will have something.

How bad is our electric infrastructure?

- Silverstein: The system isn't antiquated, it has a fine foundation, but it needs to be integrated into the digital world. Our system uses technology from that last century, with funds from long ago. It is "antique" but not antiquated. I grade it an A for effort, but C for not living up to its potential.

The 1992 Enron path led us down a difficult path that left us financially damaged. What will it take to bring the transmission system up to its potential?

- Silverstein: Re-regulation didn't stop utilities from building transmission. Utilities stopped building transmission in the mid 1980's.
- Klein: That description isn't the history of the Pacific Northwest. Re-regulation has separated transmission planners from generation planners.

What top two technologies are not being applied to the grid?

- Silverstein: Control and monitoring electronics to manage the grid. The second is targeted distributed generation for reactive power for points on the grid and substations. Transmission is such a lumpy investment, that we can do an awful lot of other options before we need to upgrade the transmission.
- Klein: Instead of using an RTO that costs $200M /year to operate we need to bring groups together.
- Silverstein: RTOs have at least five different functions: (1) Transmission planning – doing it very slowly and in little boxes (regions). (2) It's the forum of our discussion of values

that goes forward to state commissions. (3) RTOs are the forum for a coherent discussion. We haven't tackled that yet because we are still working on #1. (4) RTOs operate the grid to a professional level that few can meet. (5) They can work in the market.

Elaborate on trying to find the least-cost solution.

- Klein: Investor-owned utilities were forced into a process by FERC and it pulled the other utilities in with it. We would have a fine transmission system today if FERC weren't medaling with the process. Locational pricing is about doing your homework. To me, it should be factored in. It doesn't necessarily create an investment decision, but it can generate pricing changes (revenue increases).
- Silverstein: Locational pricing is needed, but it doesn't get a power plant in an area if locals don't want it.

Do we need real-time pricing?

- Klein: It's a good tool, but if you look at the shallow spectrum of pricing of our system, and current situation, real-time pricing isn't right for the Pacific Northwest. If you're a load or generator and you want to know about access, it can be a crude indicator. If we knew what the price for access was, we would be able to know what choices we wanted to make.

Is there a problem with relying over dependence on demand-side management?

- Klein: No, DSM is viable. There are plans for a tripling of DSM investment.
- Silverstein: I tend to view distributed generation as a DSM resource. I consider anything on the customer side of the meter as DSM.

Talk about your experience the outage study.

- Silverstein: The blackout investigation was a technical challenge. We had great people to work with and thanks to PJM for keeping their finger in the dike to deal with it. Can it happen here? The answer is yes! Consider the Arizona event – that was a couple of relay errors. We are not yet ready for wide spread system protection. Everyone still plans and designs for the last outage. We need to design for the next outage. A cyber caused outage is a real concern. What if the bad guys take control of the system?
- Klein: The RTO agenda is not the solution for the Northwest for a reliability problem. We don't need someone in DC telling us what to do.
- Silverstein: I keep looking to how far prices have gone down in places that have RTOs. Ten years from now (if we don't do an RTO) we will wonder why our prices are so high and why our system reliability is so bad.

What is the biggest mistake we made in the last 10 years?

Klein: Good intentions to better serve industry and customers. Wish I stood up earlier and stronger about re-regulation.
Silverstein: The thinking that the Pacific Northwest isn't affected by others. We can't get the genie back into the bottle.

Could you provide a closing comment?

Silverstein: Stop talking about stuff and start doing it.
Klein: There isn't a silver bullet.

Concurrent Session #2
Non-Wires Solutions

Panel:
Robert Kahn (moderator), Northwest Independent Power Producers Coalition
Marek Samotyj, Electricity Innovation Institute
Tom Foley, Energy and Environmental Economics
John Nieremberg, Seattle City Light
Ralph Cavanagh, Natural Resources Defense Council

Bob Kahn introduced this panel and highlighted that it would cover differing perspectives of approaches to implementing non-wires solutions.

Marek Samotyj presented concepts on Multi-Energy, a distributed generation-based approach to deliver energy services from an integrated system of various resources. One potential benefit of this approach could be a micro-grid concept where half a dozen homes could combine a number of energy sources, reducing dependence on the local utility. The Electricity Innovation Institute is focused on creating energy solutions that integrate tools to create the lowest cost energy and best balance of performance for energy users. Samotyj also described possible uses or applications for the Multi-Energy approach and described potential benefits, including cost-savings, reliability and environmentally responsible. He encouraged participants to be thinking in terms of future solutions when making investment decisions today.

John Nieremberg described how Seattle City Light has begun to integrate non-wires approaches into its planning process and how they are involving conservation efforts as well. This includes consideration of how some of their high-tech customers are getting sophisticated and are now incorporating their own non-wires solutions to prevent impacts to products or services due to unplanned outages. He emphasized the need to partner with many of these and other customers to craft solutions that are mutually beneficial. They are also using smarter technology to patrol and gather data about their lines and look for smaller investments to reinforce wires and therefore delay building new lines. Nieremberg also emphasized the need to consider wires in the full set of alternatives to any transmission needs.

Tom Foley discussed the role of non-wires solutions in light of planning, recognizing the grid is "one big machine" from generating resources, to transmission, to distribution. Foley defined non-wires as everything but poles and wires (re-dispatch and peak use of generating plants, demand-side response, distributed generation, etc.) Foley foresees a possible shift to combined heat and power, but hopefully that shift would come ahead of any major investment in wires. The Non-Wires Round Table made good progress. The pilots are designed to show the feasibility of non-wires solutions. He also cited other examples of groups looking for non-wires solutions, including PacifiCorp and the Oregon PUC.

Ralph Cavanagh emphasized that a major contribution of the Non-Wires Round Table is to actually get to practical use of energy efficiency. He talked about how skepticism remains, despite the examples proving the value of energy efficiency. He spoke of the need for transmission and distribution providers partner to avoid implementing non-wires approaches that create split or perverse incentives. Cavanagh emphasized the value of developing portfolios of

non-wires solutions, recognizing that many challenges remain as to who will implement and manage them. He commended the progress made by and recommended a renewed commitment to the Round Table. Cavanagh said that the next non-wires challenges will be to move them to larger audiences and to invest in advancing new technologies and approaches. He further suggested that delivering value to the high voltage grid through such non-wires approaches should be compensated by that utility to create incentives.

Concurrent Session #2

Energy Efficient Future

Panel:
Mike Weedall (moderator), Bonneville Power Administration
Dilip Limaye, SRC Global Inc.
Tim Stout, National Grid USA
Richard Beam, Providence Hospital
Tom Kerr, U.S. Environmental Protection Agency

Mike Weedall led this group through a discussion with region, national, and international leaders regarding the future of energy efficiency.

Dilip Limay explained that the International Institute for Energy Conservation does interesting, relevant energy efficiency work worldwide and it focuses on two themes. First, energy efficiency is a mainstay of the utilities and second, long-term success will occur only if the private sector participates and benefits.

Limay outlined how Indian utilities have been broken up into transcos, gencos, discos, etc. and while losses are extremely high (40 to 50 percent), transmission and distribution (T&D) is still "expensive." Demand-side management was found to be cost effective for India especially when you take into account the losses. They target DSM to areas where the utilities are losing money and where T&D upgrades may be required.

Limay explained how the utilities have brought the private sector in so that the utility, customer and the private sector benefit on DSM projects. IIEC's mission is to accelerate global adoption of environmentally sustainable development.

- Compact fluorescent lamps (CFL) program. The utility purchased CFLs are low cost because of economies of scale and the customer is through utility billing system. The customer gets a lower cost CFL with a better warranty. The manufacture benefits from increased sales.
- Muni water pumping. The utility provided technical help in sizing and efficiency specs and the private sector provides equipment and installation.
- Solar/propane water heating. Residential electric water heaters cause the morning peak. The utilities and private sector developed an alternative to reduce system stress.

Tim Stout started by asking attendees if they remember the 70's book Limits to Growth, and pointed out that it now has an update. He summarized the increased focus on corporate and environmental responsibility and the commitment to renewables from many large corporations. He pointed out a parade of new trends; the interactive impacts of green buildings, the successful

EPA Energy Star program, the Toyota Prius seriously implemented by a car company, the huge step for LED (light emitting diode) lighting, and the impressive list of energy features of the new Bank of America building.

Stout then challenged attendees on discussing the national grid, "Do we practice what we preach?" We need to focus on environment, climate change, and the future. He quoted Margaret Mead, "Never deny the power of a small group of committed individuals to change the world." We need to feed that passion.

Richard Beam described a brand new energy efficiency future. Your challenge is to make a business case for the great projects you have, otherwise they won't get funded. Getting on the radar with decision makers is tough if your company's energy expense is low (for Providence). Turn the business case process around to put it into terms that reveal its true value. For example, at Providence with its low operating margin, every dollar put on the bottom line would otherwise require huge revenue increases.

Beam recommends developing a strategy to present clear goals and criteria and to demonstrate the value to the institution. It works because he demonstrated to senior leadership that life cycle costing is the appropriate method, and that the traditional first cost approach is flawed. He demonstrated to management that it has to include energy efficiency elements beyond just complying with code. Key to decision makers is the internal rate of return (IRR) hurdle rate. If your project can pass the IRR requirement, you guarantee that you will get the funding. You may have an investment cap, but when they see the performance, caps may be removed as long as it meets the IRR.

Tom Kerr spoke of policies, recognition, and partnering as key. The Environmental Protection Agency provides a platform like Energy Star. They track, inform the public of accomplishments, and the progress shows everyone it really works. We continually work on updates to the specifications. The business case message to stakeholders is this stuff lowers cost in wires, generation, and emissions.

Kerr described other tools and technologies of interest at the EPA. For example in an effort for more buildings to meet/verify Energy Star performance, bench marking tools are developed to compare buildings in key sectors. It can be useful for building owners to make comparisons. Tom also spoke of generation technology. Combined heat and power is very important to EPA because it reduces waste heat from fuel used generate electricity. He also said that distributed generation doesn't need to mean dirty diesel anymore with the foothold that cleaner distributed technologies have gained. In closing, Kerr said that if you have an innovation that could be used in this region, think how you could bring together the resources of EPA, the state and others. You could have a receptive audience at the EPA.

Concurrent Session #3
Transmission Adequacy

Panel:
Vickie VanZandt (moderator), Bonneville Power Administration
Wally Gibson, Northwest Power and Conservation Council
Chuck Durick, Idaho Power
Aleka Scott, Pacific Northwest Generating Cooperative
Kris Zadlow, CalPine Energy Services

Vickie VanZandt continued the transmission adequacy discussion with her take-aways of the symposium thus far.

- From the operator's perspective, if it doesn't crash or cascade, the lights stay on. Another perspective is resolving congestion. Then, there is something between the two that will be the answer – the sweet spot.
- When dispatchers call upon something to work, it has to work.
- Things that happen here affect other states.
- The economy is down, but the infrastructure is still sitting there. It could happen but the economy might be masking the possibility of a problem.
- Be aware that incremental approaches may use up the rights of way resources and corridors.
- Reactive power is required and is valuable.
- Figuring out the right load modeling is important for us to understand and to react to events.

Wally Gibson asked if we really need transmission adequacy standards and premised his response by stating these were his opinions, not the NWPCCs. How do we get correct investment and where does it come from? By clarifying the economic interests, defining economic projects and alternatives, appropriate pricing. Defining economic projects is complex, contains large interactions, sticky constraints, and problematic to find stakeholders to put money into it and to get a return for the investment. If this doesn't work correctly we may get the pork barrel affect. We need long and intermediate-term planning.

Chuck Durick paired two big themes: non-wires solutions and adequacy standards, both of which require planning. For non-wires alternatives remember that energy and peak are important. Energy saving is important when peak occurs. DSM needs to be focused and temporally targeted. DSM must be careful not to shift consumption to peak periods. Price fluctuations are common. High demand coincides with high prices and suggests that we need the right tools to value how those prices fluctuate and bring that back to non-wires solutions.

Determining short-term prices must be transparent. The economics of adequacy planning is important. Grid to transmission to generation adequacy, it comes down to supply adequacy. How much transmission do we need? We need to recognize diversity and displacement, and re-dispatch to make it available to others that need it. For wind it's a free fuel. Though we can't afford to pay the cost of expanding the transmission can we re-dispatch existing generators to allow wind generation to get through. The prices need to be real so that this isn't just hypothetical. It needs to be real so that others will act on it.

Aleka Scott reflected on the trouble with Transmission. She believes that adequate transmission leads to robust power markets. Though FERC Orders 888 and 889 were to solve discriminatory access it actually caused all sorts of other problems. It especially caused an inability to plan generation.

Reform is needed at every level including state and federal levels. It is difficult to acquire firm access on the BPA system because there is no available transmission capacity. This is a problem to everyone that needs power. Developers have a tough time getting their resource to a perspective customer. There are also local reliability problems but we do not have a good forum for getting it solved. We need a grid wide basis to conduct this business. IOUs have recovery problems with multi-state issues (PacifiCorp example).

Nobody has authority to settle disputes thus we wind up in gridlock. An independent entity is needed to run the studies, take input from all the players, and allocate cost of expansion and non-wires alternatives. What can we do about this? Remain hopeful that we will get to a process that will provide a foundation to work from.

Kris Zadlow was glad that the U.S. and Canadian analysis of the black out showed that we actually did what we were supposed to. In all, Zadlow concludes that the utility industry has inadequate monitoring systems, inaccurate models, and an overall lack of investment. He notes the many different planning standards between utilities, even those in the same region. We need standards that are enforceable and separate entity to review to determine if something is adequate.

There are 1000 planned projects for a cost of $2.5 billion. How much will be built? Zadlow notes the success stories like the Oklahoma/Kansas congestion. They created incremental point-to-point transmission service fees. The upgrade was done in a year and the consumers didn't see a rate increase. The consumers that wanted the available transmission capacity paid for it. Creative rate methodology gets third parties interested. Create a rate in which a third party comes in as the investor to takes the risk. Who is motivated? Investment is ready in the wings. Adequacy will restore confidence in the energy sector, financial sector.

Concurrent Session #3

Energy Efficiency New Technologies and Trends

Panel:
Jeff Morris, Northwest Energy Technology Collaborative
Harvey Michaels, Nexus Energy Software
Dick Wanderscheid, City of Ashland
Rob Pratt, Pacific Northwest National Laboratory
Wayne Embree, Cascadia Partners

Jeff Morris discussed how the Northwest Energy Technology Collaborative has three tracks: (1) research and development – focusing on work of the national laboratories; (2) demonstration – portfolios, pilots and incubators; and (3) regional branding for the Pacific Northwest could be a world-wide center for innovation. The Collaborative incubates companies through the "valley of death" that start-ups typically face. An issue to deal with is that we live under an 18th century

energy and utility regulatory system. The vision should be for a (northwest) silicon valley for new ideas in energy.

Harvey Michaels presented how Nexus offers software that allows consumers to manage their energy bill. The software provides: relationship of value to cost, benchmarking and management of controls and options. Software turns complex rates and rules into simple-to-understand information about the impact of customer's action. A strategy for getting subscribers: sign up utility customers during "touch points" when customers call with an inquiry (e.g., question about appliances, new customer, need specific information). Few people seek out an advertised web site – 30 percent of utility customers call their utility annually. Their vision is targeted outreach to specific customers where transmission constraints occur.

Dick Wanderscheid described how the City of Ashland is demonstrating an interactive home/utility energy management system (Invensis). Media outreach followed by direct mail eventually yielded success in signing up 100 homeowners. We have moved beyond concepts and are now piloting real-world initiatives. When these "smart energy" approaches prove to be commercially viable, the power grid will be profoundly changed. Energy conservation and environmental benefits will result.

Rob Pratt spoke on how Grid Wise is a new vision of the power system. It involves "technologies that cross enterprise boundaries." Industry, regulators and utilities are cooperating to "create value for all participants." Value proposition: reduction of the anticipated half trillion dollars that may be spent grid infrastructure over the next twenty years. Vision: "Virtual electric infrastructure."

One example would be selling micro-turbines using accumulated benefits from customer, distribution system, transmission system and avoided generation. Another example would be frequency flux recognition software that allows the end-users to take action with "grid friendly appliances" before catastrophic failures and damage occurs.

Wayne Embree talked about how Cascadia Partner's venture capital philosophy is to "invest in market opportunities." One issue is that it is very difficult to sell into a market that has variable regulations. Embree listed several examples: an engine with a higher-than normal power density – now being tried in China; real-time monitoring of substation transformers; and Lenox (alternative to Windows) open-source operating systems for energy industry.

Lunch Session

Panel:
Ethan Cohen, Utilipoint International, Inc.
Jon Brock, Utilipoint International, Inc.

Ethan Cohen and Jon Brock presented an overview of observation, trends, and innovations related to the demand response market.

- There are two drivers in the market. Internal to utilities and load serving entities. However externalities also drive our business. Regulatory forces, stock market pressure, service to community, and consumer advocacy have also shaped change.

- We see rebirth of automated meter reading and demand side management technology because it is hard to site a new site generator or transmission line.
- Utilities still in generation are now looking at self-build because they want to own their destiny. A change! However rising natural gas prices affect decisions.
- Utility/regulator relationships have improved recently due mostly to recognition that problems don't get solved in rate cases anymore.
- Transmission ownership can change from town to town and it is not always obvious that mitigating congestion doesn't always solve the bigger problems.
- Siting/permitting issues loom as a big challenge especially when transmission crosses multi entities/counties/states.

About Resources

- Over-dependence on Canadian resources is a concern.
- Be careful how you borrow ideas from other areas because it may non-transferable to resolve the unique issues of your problem.
- Solar and wind are big for venture capitalists.
- Clean coal? It costs.
- Nuclear? The waste issue is still a problem.

Demand-Response Tools

- With or without traders, wholesale prices will increase at congestion points.
- Demand-response means different things to regulators, utilities, and even between utilities.
- Demand-response is going through rapid change. Consumers actually taking the power into their own hands and making their own decisions.
- Be careful how we articulate demand response; otherwise it may sound as though it is something we "do" to people. It should never affect heat, light, or comfort.
- Demand response is not well defined and the metrics for sizing and evaluating the market are still not known. It seems to represent a best opportunity at low cost, but is that really true?

On Utilities and Demand Response

- Most utilities are not ready for demand response because they spend too long figuring out how to implement.
- Despite all that planning, utility programs are typically not well managed and tend to be short lived.
- How many utilities have a CIS that can deal with demand response for large-scale use, including residential?
- More regulators are having utilities look at the alternatives to generation.