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THE NORTHWEST ELECTRICAL POWER SYSTEM IN THE WESTERN POWER CRISIS -- ONE YEAR LATER

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Last year I visited the annual meetings of many business associations in the Pacific Northwest, describing the fundamentals that were driving electric power in the West. It was a distressing picture of inadequate supplies and volatile prices. Today, you may wonder if the fundamentals have radically changed. The crisis seems to have disappeared. The short answer is that only the drought has gone away. And although economic activity has also slowed, the potential power demand is still structurally there, poised to pick up again as soon as the economy begins to recover. What happens then will depend on how much has been accomplished of the seven-point agenda I advocated last year. Before I review that progress, let me recap the fundamentals.

Congress passed the Energy Policy Act of 1992 with an objective of creating a competitive playing field for wholesale power supplies. It gave the Federal Energy Regulatory Commission means to prevent a high-voltage transmission owner from favoring the transport of its own power supplies over another's. With the natural monopoly -- the transmission wires -- operating as a non-discriminatory, open-access carrier of power, the generation owners would have access to markets never before accessible to them.

It worked. A new cadre of middlemen -- non-utility power marketers and brokers -- rushed in to link would-be buyers and sellers across the Western Interconnection. And with the West in a surplus condition in power supplies, wholesale prices plummeted.

Meanwhile, the retail electricity market, under the jurisdiction of the states, would remain regulated and captive until the states could decide when and how to usher in retail choice (the ability of consumers to select power supply providers). This froze potential investment in new power plant in many areas of the West. Utilities with the traditional retail load-serving obligation could not know what loads they would be required to serve in the future. Merchant power plant developers could not know what their opportunities would be for establishment of long-term supply relationships at retail or with retailers. And the short-term wholesale market was flush with power.

Although the retail rules are still cloudy ten years after the Energy Policy Act, the wholesale picture is now clearly one of very tight supplies in the West. While Western electricity demand grew more than twenty percent from 1992 to 2001, generation capacity grew less than five percent. Capacity margins shrank to all-time lows. As the Pacific Northwest entered the winter of 2000-2001, we estimated that

our corner of the grid -- serving a 38,000-MW winter peaking load -- was about 3,000 MW short of being able to sustain historic levels of reliability. By "historic levels" I mean enough generation capacity, and the high-voltage transmission to carry it to distribution centers, to assure that loss of service to firm loads does not occur more frequently than once in 20 years. In other words, a blackout-causing event would be a rare coincidence of multiple bad situations; for example, a combination of drought (most of the Northwest's generation is hydroelectric), major unscheduled losses of machine capability (generation or transmission outages), and a severe arctic weather blast. We estimated we were looking at a one-in-four chance of losing the lights in the winter of 2000-2001.

All during the summer of 2000, California teetered on the edge of blacking out, repeatedly cutting thousands of megawatts of interruptible industrial load but never going to involuntary curtailments ("rotating blackouts"). The West breathed a sigh of relief as it finally headed into fall.

Then winter produced a shock. The Columbia River basin got little rain and snow, which resulted in the second lowest streamflows in recorded history. This situation eliminated 6,000 MW from what the Northwest hydropower system usually can deliver in February.

And California produced a second shock. Power we normally import from California in the winter was completely unavailable. California began blacking out under loads of less than 34,000 MW when it has generating capacity of more than 50,000 MW. Never before had we seen anything like this. Large numbers of power plants were out of service for a host of reasons on any given day.

On a planning basis, the Northwest has relied on the availability of up to 3,000 MW of California's winter surpluses to meet our needs. Indeed, one reason that the large transmission interties were built between the Northwest grid and the California grid was to take advantage of our complementary peak demands. California experiences its system peak in the summer; the Northwest’s is in the winter. Northwest shipments of energy into California the previous summer had kept them out of blackouts. It was astonishing that next to nothing should be available from the California generators for export to the Northwest in the following winter.

So the equivalence of all three of the rare events whose coincidence can cause blackout in the Northwest were with us in the winter of 2000-2001: (1) drought; (2) the major loss of machine capacity, in the form of the loss of imports from California; and (3) the deficit we had as winter approached (an amount that is equivalent to the effect of a modest arctic cold snap). Indeed, the lights could have gone out in February.

The reason the lights stayed on was that more than 3,000 MW of Northwest industrial load was shut down. Bonneville, the investor owned utilities, and several of the larger municipal utilities paid some of the most electricity-intensive industries in the region to shut down and to stay down for the duration of the drought.

The drought and the double California blow of disappearing generation and stratospheric prices caused considerable financial bleeding in the Northwest. Prices were at times more than 10-fold higher than anything we had ever experienced before. Many Northwest utilities exposed to short-term power purchasing in winter raised rates substantially (several, ironically, as California was refusing to raise rates and was defaulting on payments for power purchased from the Northwest before the drought dried up our supplies). Several Northwest industries that pressured their serving utilities and the state public utility commissions several years ago to let them buy power on the wholesale spot market went out of business. Bonneville raised rates 46 percent on October 1, 2001, to cover the cost of new power supplies that it had to arrange on fairly short notice for its customers who had come storming back to demand renewal of service five years after leaving us to go out into the short-term market.

I am frequently asked how the Western situation could go from "wonderful" to "awful" between 1999 and 2000. Of course, it didn't. The "wonderful" situation of very low short-term prices and very reliable deliveries was a product of surplus generating capacity that had been built for native load, and surplus transmission capacity that enabled power to move easily in all directions throughout the system. That was the condition in 1992, but load growth since then had steadily eaten through the surplus, and transmission congestion had begun to bottle up the generators' paths to markets.

This deterioration did not happen overnight. But something was indeed masking it: The Pacific Northwest had a string of six good-to-fabulous water years from 1995 to 2000. Water in the Northwest swings the generation supply in the Western Interconnection by 13,000 average megawatts in any given year (+/-6,500 aMW from average). During the summers prior to 2001, the Northwest was sending up to 7,500 MW into California on their peak hours. The drought in 2001 tore the mask off. If the weather and the economy hadn't cooled at the same time, California undoubtedly would have experienced scores if not hundreds of hours of rotating blackouts in 2001.

During the drought, I noted that there were four things that could help the Northwest immediately: Restoring the California generators' availability; installing small emergency engine or turbine generators in the Northwest grid; reducing Northwest consumption; and reducing spring and summer flow augmentation and spill for fish migrations in the Columbia River, which increases hydro generation availability.

As these things can help significantly in our dealing with any future supply interruptions, it is worth noting how we are doing here. First, California appears quite unstable, with major bankruptcies among its large investor owned utilities and the demise of Enron and its promised supplies of power. So we should have no expectation that California will soon be a stable partner again. Second, less than half of the planned emergency generation has been installed. Third, on the demand side, Bonneville spent more than $400 million curtailing industrial load in 2001; and we extended most of those curtailments into 2002. We also bought our way out of fractions of our wholesale supply obligations to our utility customers, and persuaded nearly all of them to take additional load off Bonneville voluntarily. Fourth -- our last resort -- although we reshaped river flows during the drought that were

supposed to support fish migrations, that operation only reduced the spring flow rate of the Columbia River by less than two percent. And our cutback of the spring and summer spill program – a program in which water is sent over spillways instead of through turbines – also had little biological impact during the drought situation. Mother Nature, by herself, hammered the salmon hatchlings last year, but there was very little the hydropower system could do about that, one way or the other. In 2002 we did not have to pursue any of these emergency river operations.

For the long run, in order to assure the Northwest of reliable and economical power service in the new and very different world of power commerce, Bonneville recommended in 2001 the following seven-point program:

1. Bonneville, the several states, and private sector developers needed to expedite the siting, construction and integration of new power plants. Bonneville's transmission planners received requests for integration studies of scores of generation projects, totaling more than 30,000 MW of new capacity, for which developers were seeking sites in the Pacific Northwest.

2. The owners of the region's high voltage transmission needed to make at least

20 major reinforcements to the grid during the next five years. This would add more than 700 circuit miles of line. Most of these projects are in the Bonneville system.

3. Bonneville and its public and private utility partners needed to move conservation and renewable resource development to the forefront of our efforts to balance supply and demand. In the next five years, the cost-effective energy equivalence of more than 1,000 aMW could be reached with conservation and renewables.

4. Bonneville and its federal partners -- the Army Corps of Engineers and the Bureau of Reclamation – needed to expedite the optimal expansion of the existing federal hydropower facilities and achieve a coordinated maximal operation of these facilities. In the next five years, a cost-effective 500 aMW could be developed.

5. Bonneville and the investor owned utilities of the Northwest needed to advance a blueprint for a single seamless regional transmission organization -- "RTO West" -- to assure electrical system stability in a world of merchant suppliers and retail choosers.

6. The high-voltage transmission operators, the distribution operators and the states needed to accommodate and encourage the greater role and deployment of the new small-scale, distributed-resource technologies that will make it possible for consumers both to sell to the grid and to achieve a higher quality of power service than the grid alone can provide.

7. Finally, and perhaps most importantly, the States and the stakeholders of the Western electric power system needed to discuss, plan and execute a retail restructuring that will reconnect the retail

and wholesale power markets and end our paralyzing confusion about the future of competition and utility obligations to serve.

How are we doing against this list?

1. Interest in building new power plants has all but dried up. When wholesale prices were on the moon a year ago, there was a land rush for plant sites and permits in the Pacific Northwest. Seventy projects were in the queue. Several were completed – totaling 2238 MW of capacity -- and of the eight others on which construction had begun, only three are still limping ahead. They could add another 1028 MW to the regional power pool, but the companies developing these projects have been hurt by the Enron collapse and the subsequent decapitalization of the power industry. And most cannot turn a profit with their plants at today's wholesale prices.

2. Bonneville needs access to capital. It is rapidly approaching its Congressionally-set borrowing ceiling, and may not be able to start construction on many of the large, multi-year projects that everyone agrees should be built. Bonneville is entirely ratepayer financed – it does not draw on taxpayer resources – yet we have been unsuccessful in trying to get our ceiling raised despite the efforts of a united Northwest Congressional delegation. In the arcane world of the Federal budget, raising Bonneville's borrowing ceiling "scores" as if it were an expenditure of taxpayer funds.

3. Bonneville has moved out aggressively with conservation – both directly financing it and giving rate discounts to its utility customers who are financing it. Bonneville has the largest wind power acquisition effort underway in the country. We expect to have several hundred MW of wind capacity on line by 2004.

4. Bonneville needs access to capital. (See point 2, above.)

5. The RTO West development team is making steady progress, slogging through very complex technical/physical and market design issues, mindful of the risks and high stakes involved. California was a staggering, almost paralyzing, lesson in how to screw up in this area. FERC and the States are reeling in confusion, not sure how to move ahead.

6. Distributed generation is now being driven by power quality issues, but slowly, and it is occurring in spite of the disorganization of the grid operators.

7. California failed abysmally on this last front. It charted its course to retail restructuring amid the "wonderful" fiction of 1995. It myopically chose to throw most of the consumers of the state into the day-ahead market. It caused most of the power plants supplying this market to be sold into the hands of merchants who have no load-serving obligation (out of the hands of the utilities who do). It lowered and froze retail rates in a way that first prevented alternative suppliers from attracting retail business and later prevented the utilities from recovering their costs of purchasing daily power from the merchants. It is hard to imagine a more wrong-headed strategy -- a more confounding combination of initiatives that fed on each other to produce an explosion of price and an implosion of supply.

And yet, each succeeding step that California has taken since the collapse of its major institutions of electricity service has demonstrated the depth of new untapped reservoirs of lunacy. First, rather than reform the California Power Exchange's day-ahead market, they shot it dead, as if there is no place for a grid-wide clearinghouse for short-term transactions. They are now back to the inefficiency of bilateral telephone calling. Second, they rushed to sign long-term contracts in the middle of a short-term panic that had grossly distorted out-year prices. There is a growing sense that these contracts are far out-of-market. Third, they have been considering selling $12 billion in revenue bonds, in part to finance the payments they owe on power they have already consumed, and they have ended the exercise of retail choice by Californians in order to hold ratepayers captive for the 15-year life of these bonds. Fourth, they have sought to obtain refunds from sellers who operated in the California market and played by the California rules. They essentially want to change those rules (what constitutes "just and reasonable" prices) and retroactively apply the changes to billions of dollars of transactions.

I fear this chilling litany is still incomplete. California is careening wildly. It is a frightening spectacle.

To calm down Pacific Northwest audiences, I always point out that there are genuinely bright prospects in the electricity picture, as long as we look north from the California border. Seventeen years ago, Bonneville's basic wholesale rate to its utility customers for delivered firm power was $23 per megawatt-hour. Just before our October 2001 rate increase it was $24. The rest of the Northwest power industry, until just recently, has been similarly stable. So real prices fell dramatically during that 17-year period.

If we can close the current demand-supply gap, I believe there is again potential for a long-term decline in real prices, absent new environmental regulatory intervention. Such a decline would be the result of retirement of our dry-hole nuclear debt, modest declines in fuel costs, technology improvements, operation and maintenance efficiencies, and the fact that the growth of electricity consumption is now slower than the real growth of Gross Domestic Product. The last factor arises from the increasing efficiency of our use of electricity and the lower growth of electricity-intensive industries, which together could completely offset the sizeable increase in power requirements we are seeing in computer-based commerce and communication.

The fundamentals for electric power in the Northwest, are excellent. And here I would explicitly include British Columbia and Alberta. We have unparalleled options in the potential of western Canadian gas, in the development of coal on our eastern perimeter from Alberta through Montana and Wyoming, and in our ability -- the best in the world -- to store and utilize the intermittent output of wind and solar generation through the giant storage batteries that are the hydro reservoirs of the Peace, Columbia and Snake river systems.

That is the good news. The bad news is that the incomplete (or, in the case of California, the misdirected) restructuring of the power industry has produced ugly spikes in this picture and can do so again.

Although I believe that the spikes will be transitory, I know that a good (on average) long-term picture may be no consolation to a business that has to maintain a positive cash flow and a competitive posture from quarter to quarter while it may be experiencing a sharp power-price jab. Bonneville's promise to its customers is to leave no stone unturned to find the least-cost path through the current turmoil, and to steady the course to that brighter future that invariably results from new applications of electrons to the enterprises of our society.

A Post-Enron Postscript

California and other officials who have been outraged over the trading practices described in Enron memos have suggested that these revelations show that power sellers were really the cause of the Western power crisis.

In fact, it is the other way around. A power system that was stretched to the edge, and a neophytic market system with flawed rules, created the opportunity for marketers to push it closer to the edge and make more money. Such practices are the exploitation of a crisis situation, not its cause. I do not defend them, for in my mind there is an ethical problem in business dealings that exacerbate a crisis having serious public health and safety implications, not to mention the additional damage such dealings do to the Western economy. But the big money – billions of dollars – that was made in 2000 and 2001 at the expense of hapless Western ratepayers was made by the investors who bought some old power plants in California five years ago, initially did poorly in the low wholesale markets prior to 2000, but then were well positioned to sell into the very tight markets that finally eventuated after years of vigorous economic growth and the almost total lack of supply expansion.

The wild volatility of the wholesale power markets was not a passing, anomalous event that is unlikely to be repeated. Quite to the contrary, all the necessary ingredients are still close at hand, and can come together very quickly to send spot power prices to the moon, or Mars, and back. Extricating ourselves from this boom-bust exposure should be a high public policy objective. It is tied up in issues 2 and 7, above, but there is still little constructive movement on the latter (clarifying the path of our industry’s restructuring).

Bonneville has learned much over the past three years that helps us understand how we can be a stabilizing force in these uncertain times and advance solutions that would be in the public interest. We will be undertaking a public discussion in the Northwest during the next six months that we hope will help shape the roles and steps that Northwest parties can take to bring our electricity future back into our confident grasp. We urge you to get involved. The stakes are very high.