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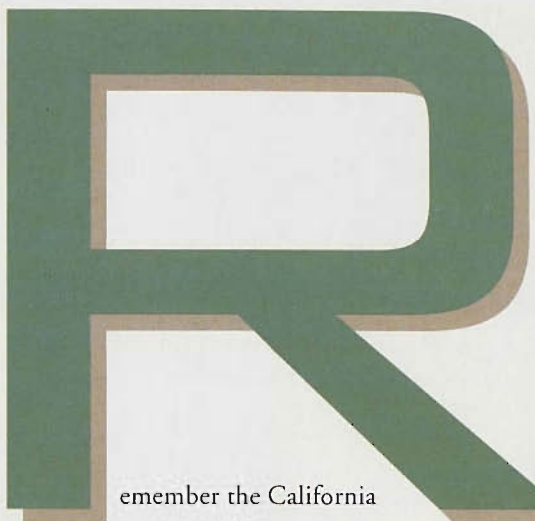
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BROWNOUTS IN CALIFORNIA BROWN FIELDS IN IDAHO

DID CONVERGING CIRCUMSTANCES IN CALIFORNIA POWER
DEREGULATION AND THE PACIFIC NORTHWEST'S
HYDROPOWER INDUSTRY COMBINE TO CREATE THE
"PERFECT STORM," BUFFETING FARMERS IN THE PNW AS
WELL AS CONSUMERS AND BUSINESSES IN CALIFORNIA?



Remember the California power crisis of 2000? Price gyrations and rolling electric blackouts in California captured headlines last year. It turns out that the power grid that transmits electricity between western Canada, western United States, and northern Mexico also efficiently transmits the effects of price shocks throughout the West. California's power crisis rippled to other electricity users and suppliers throughout the grid region. In the Pacific Northwest hydroelectric dams are the principal source of generation, so electricity and water become intertwined with the water link leading also to irrigation and salmon, two Pacific Northwest (PNW) icons.

The "Perfect Storm:" California's Blackouts

Like the "perfect storm," the electricity price chaos that swept the West was caused by a convergence of natural and man-made factors. Drought, deregulation, and the high price of natural gas converged to cause California wholesale electricity prices to rise to ten, twenty, or more times their usual levels. These electricity prices were quickly mirrored in the PNW.

Deregulation of the California power market destabilized western power markets. The forced divestiture of generation from delivery and the mandated use of spot wholesale transactions instead of long-term contracts accentuated price volatility in a market dominated by oligopolistic suppliers. California deregulated wholesale electricity prices while continuing to control retail prices. The retail utilities had to pay

IT MAY WELL BE TIME TO
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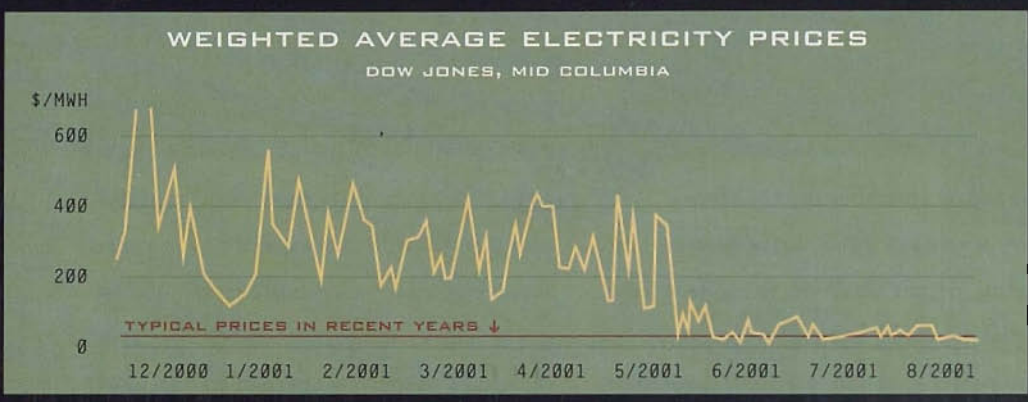
BY JOEL R. HAMILTON
AND
R. GARTH TAYLOR

unprecedented prices to electricity generators, without being able to pass escalating power costs on to consumers. With no way to lock in payment for their power purchases, price signals from wholesale markets failed to reach consumers. Therefore, there was no incentive to conserve. Deregulation also left no clear line of responsibility for the elements of the power grid that are used in common, such as reserve generating capacity and the power transmission system.

Power exchanges between California and the PNW traditionally help both regions match demand and supply. During the early months of 2001, widespread drought, near-record low stream flows throughout the Columbia River Basin, and constraints imposed by endangered salmon limited the PNW's ability to send power to California.

Driven by low gas prices, technological advances, and clean air concerns, natural gas combustion turbines have become the preferred method of generating to meet peak demands. Deregulation of natural gas markets and a new pipeline from Canadian gas fields to the Midwest escalated Western natural gas prices and increased the cost of power generated using gas turbines.

IS THIS A PRELUDE TO WATER BECOMING JUST ANOTHER PRODUCTION INPUT TO
BE USED, BOUGHT, OR SOLD, RATHER THAN A RESOURCE TO BE TREATED WITH
SPECIAL CULTURAL REVERENCE?



Politics also played a major role. The Federal Energy Regulatory Commission reflected the new administration's ideological commitment to market deregulation. Meanwhile, California governor Gray Davis was asking for strong federal intervention to dampen price swings and control the actions of oligopolistic suppliers.

Pacific Northwest Response

By late winter 2001, California's power and water problems had reached the Pacific Northwest. PNW hydropower facilities strained to produce electricity to be sent south. Meanwhile, record drought raised the fear that power shortages and blackouts would hit the PNW within a few months without remedial action. At the same time, drought conditions forced a difficult choice between generating high-value electricity at Snake and Columbia River dams, or spilling water over the dams to benefit migrating endangered salmon and steelhead — an activity mandated by the National Marine Fisheries Service. PNW utilities faced the unpleasant possibility of buying power on the wholesale market at 30 to 50 cents per kilowatt hour (kwh), compared to the two to three cents they usually paid.

Power and water suppliers and users in the Pacific Northwest took a number of actions to head off blackouts and mitigate drought. Officials declared a power emergency in order to allow operators of Snake and Columbia River dams to maximize hydropower generation by reducing the amount of water spilled for fish migration and habitat. Authorities also accelerated a program to trap migrating juvenile fish at the dams and barge them

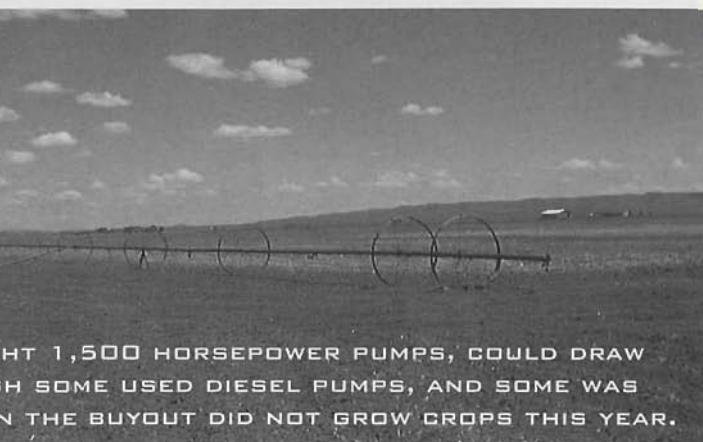
downstream, despite its questionable effectiveness.

Officials and utilities expedited construction of new non-hydroelectric generating capacity. The Bonneville Power Administration (BPA) and other regional utilities reduced deliveries to their large customers, especially the area's large aluminum mills. A power buyback program put power back into the grid, but at significant price premiums. BPA and at least one PNW utility developed programs to lease water from irrigators in order to generate additional hydropower.

Farming By the Kilowatt-Hour

The demand reduction strategy used by Idaho Power Company (IPC) is of particular interest because of its impact on agriculture. IPC supplies residential, industrial, and irrigation electricity to users in southwestern and southcentral Idaho. Most of its power is generated at dams on the Snake River. By late winter 2001, IPC concluded that looming drought and California-induced fluctuations in the wholesale power market meant it would face shortages and price shocks in the coming summer months.

IPC proposed an "irrigation electricity buyout" program to mitigate the anticipated shortage. The intent was to reduce power needs for pumping and free Idaho from depending on uncertain spot power markets. The program could also yield surplus power that could be sold to California at high prices. Large irrigators were asked to submit a bid price at which they would reduce their 2001 electricity needs by at least 100,000 kwh below their average annual use in the previous three years. The irrigators had no



(L) TWO RIVER PUMPING STATIONS, EACH WITH EIGHT 1,500 HORSEPOWER PUMPS, COULD DRAW OVER 24 MEGAWATTS AT FULL LOAD. (R) ALTHOUGH SOME USED DIESEL PUMPS, AND SOME WAS DRY FARMED, MUCH OF THE LAND PARTICIPATING IN THE BUYOUT DID NOT GROW CROPS THIS YEAR.

photos courtesy Joel R. Hamilton

“contractual right” to this power, only a history of use and IPC’s obligation as a public utility to supply power as requested. Bids at or below 15 cent per kwh of reduced load were accepted, with IPC eventually agreeing to pay the 15 cent rate to all program participants. Program participants contracted to pay a 30 cent per kwh penalty if they failed to cut their electricity use by the agreed-upon amount.

Buyout participation exceeded expectations. In 2001, Idaho farmers faced record low crop prices and questionable water supplies. In the two week signup period, 400 farmers contracted to not use 500 million kwh for pumping irrigation water to nearly 150,000 acres of farmland, almost seven percent of the irrigated acres in the counties served by IPC. Participation was concentrated in regions with energy-intensive irrigation; deep wells in southcentral Idaho and high-lift river pumps in southwestern Idaho. At 15 cents per kwh, payments averaged \$485 per acre, exceeding crop returns in even good years. Some Southern Idaho farmers are reporting that kilowatt-hours were their best crop this year.

In addition to the power buyback, IPC and BPA also tried to lease water for hydropower generation. BPA leased a modest amount of water from Columbia Basin Project farmers at 12 cents per kwh, and IPC initially offered \$60 per acre-foot to enthusiastic Idaho farmers. Water transactions would be handled through the previously

existing upper Snake water bank, so farmers could be assured they would not forfeit their water rights because of non-use. However, when the “Committee of Nine,” which oversees the water bank’s activities, announced that water consigned to the bank would go first to water-short irrigators, water lease negotiations ceased.

Winners and Losers

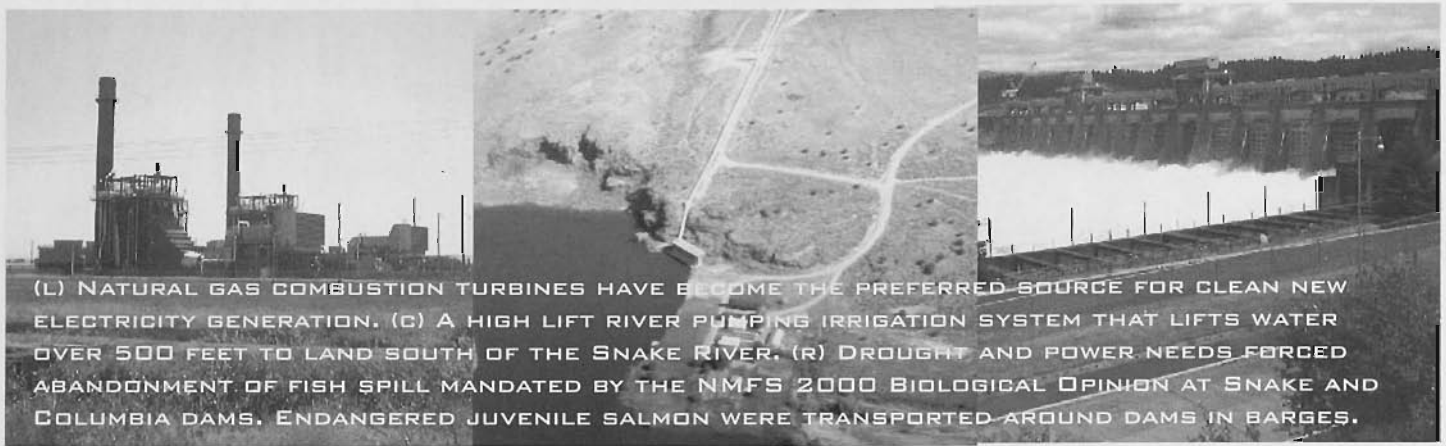
In February and March, as the drought and California price disruptions made headlines, wholesale power prices ranged from 30 to 50 cents per kwh, with indications that they might go higher. By early June the buyouts, conservation, new generation capacity, a weakening economy, and California re-regulation combined to push prices back down to two- to-four-cent long-term averages. Since then, California has occasionally even had to dump excess electricity bought on long term contracts. Is this just a lull, or is it the end of the perfect storm? What conclusions and implications can be drawn about what has happened?

The power shortage and drought led to emergency abandonment of fish spills at Snake and Columbia River dams. The maximum possible numbers of juvenile fish were trapped and barged around the dams. Juvenile salmon that escaped the traps and migrated in the river reportedly experienced higher mortality, and steelhead in-river mortality was sharply higher. Given the uncertainty about the survival

of fish transported by barge, the overall effect on fish will not be known until whatever is left of this cohort returns after two to four years in the ocean. However, the message is clear — blackouts trump endangered species.

Drought, land idled by the irrigation buyout, and higher energy prices all combined to cut production of some Idaho crops. Preliminary guesses are that 20 to 50 percent of the land that participated in the irrigation electricity buyout grew at least some crops with dryland farming, reduced irrigation, or water supplied with diesel pumps. High-valued potatoes and sugarbeets were moved to non-participating land, leaving total acreage of these crops little changed by the buyout. Reductions in acreages of lower valued crops had little effect on prices set in national and global markets. Increased hay prices can be credited to the buyout because of transportation costs associated with hauling hay in from distant areas.

The buyout produced losers as well as winners. Impacts on communities with high program participation were significant. Sales of farm inputs and services were down, albeit somewhat offset by the effect of buyout payments spent in other sectors. Employment of farm labor was down. Computation of net impacts must separate buyout impacts from impacts of drought, depressed commodity prices, and escalating energy prices. Impacts would



(L) NATURAL GAS COMBUSTION TURBINES HAVE BECOME THE PREFERRED SOURCE FOR CLEAN NEW ELECTRICITY GENERATION. (C) A HIGH LIFT RIVER PUMPING IRRIGATION SYSTEM THAT LIFTS WATER OVER 500 FEET TO LAND SOUTH OF THE SNAKE RIVER. (R) DROUGHT AND POWER NEEDS FORCED ABANDONMENT OF FISH SPILL MANDATED BY THE NMFS 2000 BIOLOGICAL OPINION AT SNAKE AND COLUMBIA DAMS. ENDANGERED JUVENILE SALMON WERE TRANSPORTED AROUND DAMS IN BARGES.

photos courtesy Joel R. Hamilton

depend on the expected duration of the buyout. So far, the buyout looks like a single-year phenomenon.

The Northwest Power Planning Council predicts that over 1,300 megawatts of new PNW generating capacity should come online by December 2001. About half of this will consist of diesel-fired generator sets, mostly in the one to two megawatt range, installed or ordered by utilities or by end users. The operating cost of a diesel powerplant is about 15 cents per kwh, so if the perfect storm is over, these units may never run. Should the region count this probably wasted investment as a cost of the perfect storm, or as insurance against another? In either case, many of these costs will be borne by electricity ratepayers.

IPC's irrigation buyout program paid 15 cents per kwh for power now worth only two to four cents. This leaves IPC, the Idaho Public Utility Commission, and regional ratepayers wondering whether the buyout was a bad decision — or whether the return to normalcy is an indication of the program's success. Either way, IPC customers will pay. Given Snake River Basin hydrology, water from the one-third of the IPC buyout acreage located in the lower part of the basin cannot be redirected to water-short upper basin irrigators, but it can be used downstream to generate hydropower. The portion of this added value that accrues at downstream IPC dams goes part way to making up for the price decline. As the water continues downstream it generates power for BPA, and instream flows for fish.

Last spring, farmers proved very willing to sell their ability to pump water for one year. Can this be reconciled with farmers' traditional resistance to water markets? Is this a prelude to water becoming just another production input to be used, bought or sold, rather than a resource to be treated with special cultural reverence? The initial reaction to IPC's proposal to lease water for hydropower shows that some farmers will agree to short term water leases so long as they retain ownership of the water rights.

Perhaps a potential solution lies here. It may well be time to consider developing and adopting state water policies that allow emergency buybacks. These emergency buybacks would be simi-

lar to water leases, but would be used only in power emergencies. A properly crafted and balanced policy would provide adequate water for agriculture, but would simultaneously discourage the leasing of water that could also be used to benefit fish populations and power generating needs.

For More Information

"Out of Darkness: What went wrong with energy deregulation and where do we go from here?" *Wall Street Journal*, September 17, 2001.

More detailed information on the issues covered in this article can be found at the following sources. Each is frequently updated, and each includes links to supporting stories and comments.

Current drought conditions:

<http://enso.unl.edu/monitor/monitor.html>

Electricity prices:

<http://www.energyonline.com/dji/DowJonesIndicies.asp>

Natural gas prices:

<http://tonto.eia.doe.gov/oog/info/ngw/ngupdate.asp>

NW Power Planning Council:

<http://www.nwcouncil.org>

Idaho Power Company:

<http://www.idahopower.com/news>

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