



## Overseer's Undercurrent: Bringing Light to Reliability's Hidden Costs

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The California Independent System Operator offered electric power consumers a bit of good news this week, reporting that about \$192 million had been trimmed from the overall costs of moving electricity around CAISO's system. Largely the result of a concerted \$3 billion program of grid improvements to remove transmission bottlenecks, and what has turned out to be a successful regulatory policy of making utilities and other load-serving entities responsible for providing a 15 percent resource-adequacy reserve margin beyond forecast loads, the reduced costs helped push the grid operator's annual expenses below budget.

Still, some consumers and policy makers might be taken aback by the costs of providing grid reliability. A small chart included in the news release indicates that for 2006, CAISO spent \$476 million for reliability services - including must-run commitments, less economic energy dispatches, and compensation during minimum load conditions.

While less than half of the \$1.1 billion reliability tab paid in 2004, and a much smaller fraction of costs incurred during the worst of the energy crisis, these reliability costs come over and above the published prices for electrons that we've come to use as a benchmark of market health and stability.

One of the great, and still lingering, changes in the power market affected by restructuring was to unbundle or break apart the constituent services that make up electric power. The big categories, of course, are transmission, distribution, and generation. Readers with long memories will recall that one of the goals of California's restructuring experiment was to create an energy-only market to drive down that cost component via competition among generators and other power suppliers.

We all know how well that worked . . . or didn't work. But one of the side effects of unbundling was that another component of service that had been largely invisible - providing reliability - soon became very apparent.

Besides the energy market run by the now-defunct California Power Exchange, CAISO created a new kind of market for what are called ancillary services. Terms that had previously been known only to power engineers and dispatchers - spin, non-spin, regulation, and black start capability - were transformed into actual services with a dollar value attached.

And the value was at first astonishing. During the first year of operation, for example, the grid operator anticipated that ancillary services might run a tiny fraction, perhaps 1 or 2 percent, of the value of electricity delivered via the grid. But in July 1998, that amount jumped to as much as 60 percent over the course of a particularly challenging week. And for much of the year, these previously nonmonetized markets were amounting to up to 15

percent of the energy costs, with the meter running at more than \$50 million per month.

Part of the reason was that \$250/MWh cap on energy prices at the old Power Exchange, and partly it was working through the kinks in the new marketplace. But it took nearly everyone by surprise and, in retrospect, should have provided some kind of warning that the initially low exchange prices were not really giving us the proper "market signals" that were so important to regulators when they created the new system.

There was another new wrinkle in reliability as well: the need for generation in particular places of local grid constraint that could be called upon when needed - the reliability-must-run units. Again, this was something that had been part and parcel of the old bundled utility service, now broken apart and no longer in the hands of utilities. But as the utilities sold off their fossil-burning plants to others, there remained a big gap between saying that competition had been created and actually having competitors able to deliver into certain constrained areas - like San Francisco, San Diego, and a half-dozen other load pockets.

Likewise, the costs associated with this new "market" were astoundingly high. In the first few years of the market, CAISO had to sign reliability-must-run contracts with well over 100 generation units to ensure as much as 16,000 MW of capacity on call - at a price well over \$900 million each year. Even as the system was reconfigured to try to reduce the contract commitment, fewer units were committed but the costs of the service hovered in the high hundreds of millions of dollars.

So it's been a goal for the grid operators to greatly reduce those reliability costs - making this week's announcement a kind of delayed gratification for nearly a decade of efforts to better rationalize markets.

There have been two big developments in the must-run arena. One was the creation of the Local Area Reliability Service (LARS) bidding, which reexamined the reliability-must-run needs in eight local areas to see whether competition to provide reliability was available. In the latest LARS process, there were still eight major local areas of constraint, requiring a minimum of 10,000 MW of local resources to maintain stability. Even today, not every LARS zone is amenable to competition, and CAISO still had to enter reliability-must-run contracts.

But it was a step ahead in focusing on the problem and replacing what were essentially sole-source contracts with a more bid-based reliability market.

The other big leap was, as mentioned, the adoption of the resource-adequacy requirement (RAR), which, according to a recent report from the California Public Utilities Commission, was very successful last year. Utilities, as a whole, not only secured their minimum RAR but had capacity to spare even as the state endured sequential record peaks during the summer heat storm of July 2006.

According to the study, utilities' reserves ranged from 3 percent to 21 percent above the minimum requirement for the year. On July 24, the day of highest peak demand at 50,270 MW, the load servers could have delivered an additional 6 percent of committed capacity to the grid operator if needed.

That helps explain why the record-load week did not contribute to notable price spikes on spot energy.

It also helps explain why CAISO's overall costs went lower. According to an analysis from last October, which maybe you missed at the time, the RAR policy allowed the grid

operator to reduce its RMR/LARS needs by about 60 percent. Instead of 125 generation units providing 9,963 MW of standby capability, the reliability requirement has dropped to 65 units and 3,995 MW during 2006.

I don't have breakouts for what that means in dollars, but it seems certain that a large part of the drop from \$1.1 billion per year to \$476 million might be attributed to this.

Of course, those costs don't go away - they are just now off CAISO's books. You might argue that they are being applied where they should be, as part of the energy price being paid by end users, not spread across the entire grid.

However, we don't know, and probably cannot know, whether an RAR policy that distributes the onus for reliability margins to the energy sellers and their customers will actually cost more or less than a centrally procured reliability margin. In this sense, we've traded an apparent gain for a nontransparent cost reallocation.

Next time, some of the looming, less visible side effects of current energy market policies: What does it really cost to add wind power to the system? What will it really cost to reduce carbon and greenhouse gases from power generation?

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