



Orange County Water District supports California's electric grid while reducing costs

Orange County Water District (OCWD) is a public agency managing three of Southern California's greatest water supplies: the Santa Ana River, the Orange County Groundwater Basin, and the Groundwater Replenishment System (GWRS). They are steadfast in their mission of providing reliable, high-quality water to more than 2.5 million residents in north and central Orange County while protecting environmental habitats and natural resources.

The GWRS, operational since 2008, is the world's largest water purification system for indirect potable reuse, producing an impressive 130 million gallons of pure water daily. Following its completion, OCWD recognized that the facility's electricity demands would be substantial, accounting for a significant portion of their operating costs.

Then, they learned about demand response programs through their local utility, Southern California Edison (SCE). By participating, they could receive financial incentives to reduce energy usage, helping to offset the operational costs of the GWRS while also doing their part to ensure grid stability.

CASE STUDY



Industry

Water and wastewater treatment



10 – 11 MW

of energy reduction during demand response events, on average



~\$12.5M

in demand response earnings since 2014



DR strategy

involves temporarily lowering water production to reduce electricity usage





Demand response – reduce costs, contribute to grid reliability

Demand response is a critical reliability resource that helps the electric grid prevent blackouts and brownouts. It's often much more efficient and cost-effective for grid operators and utilities to bring demand levels down to meet available supply instead of ramping up supply to meet periods of high demand. As a result, they incentivize companies to be flexible with their energy demand through demand response programs, paying participants to reduce energy usage strategically during periods of high demand.

Demand response presented an attractive opportunity for OCWD. According to Mehul Patel, Executive Director of Operations at OCWD: "We were interested in helping with statewide electrical grid emergencies while also finding a potential outside revenue source to offset operating costs of the new GWRS facility."

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—Mehul Patel
Executive Director of Operations
OCWD

OCWD initially had concerns that participating in demand response could significantly reduce water production, potentially increasing the unit cost of water. Lower production could also result in lower groundwater recharge volumes, especially during dryer-than-normal precipitation years. These concerns were well-founded because demand response requires energy reductions, and OCWD must maintain operational continuity to uphold their commitment to providing clean water to their community.

However, their concerns were alleviated upon further investigation into how demand response programs work and learning about flexible participation options – including not curtailing all electrical load, which allowed essential administrative business functions to continue operating during demand response events.

In addition, since the GWRS is not an essential direct water supply facility, planned and temporary reductions in production could be effectively managed. This flexibility made GWRS well-suited to participate in voluntary electrical load curtailment.

OCWD's strategies for success with demand response

Ultimately, developing an effective demand response participation strategy and achieving success hinged on selecting the right curtailment service provider (CSP).

OCWD enrolled in SCE's Base Interruptible Program (BIP), a demand response program where strong and reliable performance is essential to maximizing payments. BIP compensates participants based on the difference between their typical energy usage and a pre-established energy reduction target – their maximum allowable energy demand during a demand response event. The more consistently participants achieve or surpass their target during events, the more they will earn.

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Since BIP payments are performance-based, selecting the right CSP is crucial to realizing success in the program. Before partnering with Enel as their CSP, OCWD faced challenges such as delayed notifications about upcoming events, late payments, and subpar customer service. All of that significantly improved when they switched to Enel.

“Now that we have been in demand response for several years with a competent partner like Enel, we are very satisfied with our experience. In fact, OCWD is often asked about our experience participating in demand response by other public agencies in Southern California considering participation in the program,” Mehul says. “Enel was able to explain to us the various options for demand response programs administered by SCE. They ensure that OCWD pays no penalty if we don’t meet our reduction target during an event. In addition, they provide a real-time electrical usage dashboard that allows our operators to know exactly how much load to shed. This dashboard also gives us a real-time indication of when we are not meeting our reduction targets so we can act accordingly.”

OCWD’s energy reduction strategy focuses on reducing plant water production to offset significant electrical usage – and remain operational. Enel helped OCWD develop an energy reduction plan that enables OCWD to shed 10–11 MW of load, on average, during events.

OCWD accomplishes this reduction by lowering the flow rate from 130 million gallons per day to 25 million gallons per day. At this flow rate and level of electrical usage, OCWD can continue operating the GWRS and administration building without jeopardizing their ability to replenish the Orange County Groundwater Basin, all while significantly reducing electrical load to assist in alleviating stress on the California electric grid during grid emergencies.

Rewarding good stewardship for responsible energy usage

Participating in demand response aligns with OCWD’s philosophy to be a good steward of responsible energy usage in California – and adopt sustainable practices while supporting grid reliability. By enrolling in SCE BIP and partnering with Enel, OCWD has turned energy management into a significant financial and operational advantage.

Since 2014, OCWD has earned approximately \$12.5 million in demand response payments by participating in BIP with Enel. This substantial return underscores the value of participating in demand response programs to unlock revenue opportunities and operational efficiencies – and demonstrates the success of their collaboration with Enel.

Mehul highlighted the seamless partnership with Enel, stating: “Enel has been very easy to work with and handled any issues quickly. In addition, they have structured a program and payment terms that make our participation very easy to manage.”

Mehul also encourages other companies to follow their lead and participate in demand response, having witnessed the benefits first-hand: “We would and currently do recommend participation in demand response to others in our industry. It is relatively easy to manage participation in the program, it brings in additional sources of revenue, and it helps the state of California with electrical grid emergency events.”