CASE STUDY

Santa Rosa Water unlocks flexibility and revenue with demand response

Santa Rosa Water protects public health and the environment by providing a safe and reliable water supply, wastewater collection and treatment, beneficial reuse of recycled water and biosolids, and storm water management for the City of Santa Rosa, located in northern California. They provide essential and reliable water, sewer, wastewater treatment, and storm water services for households, businesses, schools, hospitals, and many others in the community.

One additional way Santa Rosa Water is supporting the community and environment – while stabilizing energy costs – is participating in demand response (DR).

2,000 kW
of demand able to be curtailed during a demand response event

$700,000+
earnings from demand response since 2009

15 years
participating in demand response, beginning in 2009

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>
> —Tasha Wright, Energy and Sustainability Coordinator

> That crazy heat wave we got in September 2022 made me think a little bit more about how the grid works. It was an eye-opening experience to see just how fragile the system can be at times and the heavy reliance on certain industries – and how to support that."
>
> —Christian Williams,
> Wastewater Treatment Superintendent

Demand response – good for the community, good for the city

Demand response (DR) is a critical demand-side resource that leverages a facility's energy flexibility to maintain a reliable and resilient electrical grid. At times of grid stress, when there is not enough supply to meet demand, demand response participants are asked to curtail their energy usage, helping the grid to avoid blackouts and brownouts.

Santa Rosa Water's Laguna Wastewater Treatment Plant has participated in demand response with Enel North America since 2009, leveraging their energy flexibility to earn payments for curtailing energy use. Santa Rosa Water participates in the Pacific Gas and Electric (PG&E) Time of Use – Base Interruptible Program (BIP) with Enel to help maintain the grid for the local utility. Santa Rosa Water receives quarterly payments for being on standby and reducing energy use when called upon by the grid operator.

When there is stress on the grid, Santa Rosa Water has demonstrated the ability to curtail nearly 2,000 kW of demand – over 50% of their electricity usage – to hit demand response targets. This substantial reduction helps the community during times of grid stress, while enabling the City of Santa Rosa to earn substantial demand response payments.

Earning revenue with simple demand response participation

"Money," Christian Williams, Wastewater Treatment Superintendent, said when asked what was one of the main drivers for their facility participating in demand response. "That's more or less the main reason, but I liked the structure of the program. It's not too difficult to be involved with," he added. The financial incentives provided by the grid operators to be a demand-side resource can add up for organizations that choose to participate in demand response, especially with a provider like Enel that helps to protect businesses from penalties while ensuring they can maximize their earnings. Tasha Wright, Energy and Sustainability Coordinator, added in that "money was the initial interest. It's, well, free money. Why not do it as a program?"

And participation has been lucrative. Since enrolling in demand response in 2009, Santa Rosa Water has earned over $700,000 in revenue – which is helping to offset operational costs that, in turn, benefits their customers. In the first quarter of 2023 alone, Santa Rosa Water earned $42,000 by curtailing 1.5 – 2.6 MW of energy. It all comes down to curtailment strategy.

Santa Rosa Water's strategy for demand response curtailment

Santa Rosa Water uses a substantial amount of electricity to process, treat, and distribute recycled water for the benefit of the community. In order to reduce energy use during times of grid stress, they follow a straightforward approach to meet targets. The standard 30-minute advanced notification for the BIP program is their signal to put the plan into action – storing water to reduce overall usage and then turning off any remaining non-essential equipment to meet their demand response target.

Christian describes in detail what Santa Rosa Water's curtailment strategy looks like: "The less water that's moving through the plant, the less energy it takes to treat that water. So, one of the first things we do is start storing more water. We divert water that's coming into the plant to holding basins, which in turn lowers the energy needed to treat it. And then we turn off non-essential equipment, certain pumps, and certain mixers. There are also other processes, but we know we can get by without them for a couple of hours. It's no big deal."

> All in all, I think that it's moved from not just feeling like, okay, we want to make some money off this to offset costs to our customers. But understanding a little bit better what we're dealing with – climate change – and, from that perspective, wanting to do the right thing.
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> —Tasha Wright,
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Even when a demand response event is not called, Santa Rosa Water remains on standby as Enel helps to provide advanced warning of the potential when the system is projected to have added stress due to heat. "We appreciate the heads up anytime we get it on our end. We pull out our procedure when there's an elevated risk of a demand response event," said Christian.

Doing their part to contribute to sustainability and resilience

Just like the important services Santa Rosa Water provides in keeping citizens safe and protecting our watershed, reliable energy is crucial to a community's safety as well. By enrolling in demand response, Santa Rosa Water is making an important contribution to keeping their local energy grid sustainable and resilient.

For example, during California's extreme heat events in September 2022, Santa Rosa Water was one of many electrical customers called upon to reduce energy usage as the heat waves caused extreme strain to the grid. For Christian, it was the first time he had experienced the fragility of the grid. "That crazy heat wave we got in September 2022 made me think a little bit more about how the grid works," he said. "It was an eye-opening experience to see just how fragile the system can be at times and the heavy reliance on certain industries – and how to support that."

Climate change has also helped spark Tasha Wright into thinking more about the benefits of demand response outside of just the financial incentive to offset increasing energy costs. "All in all, I think that it's moved from not just feeling like, okay, we want to make some money off this to offset costs to our customers. But understanding a little bit better what we're dealing with – climate change – and, from that perspective, wanting to do the right thing," she said. "It's very much part of our organization and our fundamental desire to mitigate our environmental impact and do what we can to make a difference."

The need for a more sustainable and resilient grid is essential for both our planet and communities alike – and demand response is becoming more essential than ever for energy continuity and decarbonization. Demand response programs are playing a critical role in enabling the grid to avoid blackouts and brownouts and, in many cases, avoiding the need for the grid to fire up fossil-fuel powered peaker plants to meet demand requirements.

More than a decade of success with the BIP program

The BIP program is a capacity demand response program crucial to energy reliability in California and the PG&E service area, and as such it offers incentives for customers' important energy reductions. Since their enrollment in demand response with Enel nearly 15 years ago, Santa Rosa Water has been able to leverage value from their infrastructure while helping to build a more resilient and sustainable grid.

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