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The energy, and expense, of bringing water to the Southland

The twin forces of power costs and climate-change regulations are threatening Southern California's long love affair with imported water, forcing the region to consider more mundane sources closer to home.

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The Julian Hinds Pumping Plant is one of the hydraulic hearts of California's vast water supply system, built to push water from where it is to where it isn't, no matter how many hundreds of miles of desert, mountains and valleys are in the way. (Irfan Khan, Los Angeles Times / September 8, 2011)

ALSO

Photos: Through the desert, a precious liquid cargo

By Bettina Boxall, Los Angeles Times
November 13, 2011 | 8:50 p.m.

Reporting from Chiriaco Summit, Calif.— The aqueduct stretched across the desert like an endless blue freight train, carrying its cargo of Colorado River water to a concrete building at the base of a craggy-faced mountain.

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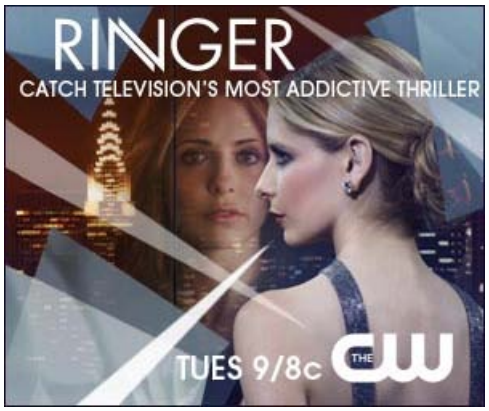

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Inside the plant, adorned with the seal of the Metropolitan Water District of Southern California, a set of massive pumps hoisted the water 441 feet high, disgorging it into a tunnel and the final leg of its journey from the Arizona border to a Riverside County reservoir.

The Julian Hinds Pumping Plant is one of the hydraulic hearts of California's vast water supply system, built early in the last century to push water from where it is to where it isn't, no matter how many hundreds of miles of desert, mountains and valleys are in the way.

PHOTOS: Precious liquid cargo

Defying geography on such a grand scale takes energy. A lot of it. It's also expensive. And it's going to become more so, driving up Southern California water rates and forcing the region to consider more mundane sources closer to home.

The volume of water propelled uphill on one recent day at Hinds weighed the equivalent of more than four World Trade Center towers and required six 12,500-horsepower motors driven by electricity, much of it from Hoover and Parker dams on the Colorado.

But the federal contract that allocates more than a quarter of Hoover Dam's hydro-generation to the MWD expires in 2017. The water agency expects to lose 5% of its Hoover electricity under a new pact that will accommodate additional customers by trimming sales to longtime users.

The MWD will have to buy additional power on the open market, at higher prices. And the state's upcoming cap-and-trade program designed to reduce greenhouse gas emissions could require the district to purchase expensive pollution allowances to offset the energy it gets from fossil-fuel power plants.

Agency officials predict that the double whammy will boost the aqueduct's energy costs, which amounted to nearly $49 million last year, by 80% over the next decade.

For similar reasons, the district could face even steeper price hikes from its other water source, the State Water Project, which brings supplies from the Sacramento-San Joaquin Delta to the Southland. That system is the single biggest power user in California.

Costs there are expected to climb by $20 million a year after the Department of Water Resources drops its ownership interest in a coal-fired Nevada power plant in 2013, and replaces it with cleaner electricity sources.

The twin forces of energy prices and climate-change regulations are threatening Southern California's long love affair with imported water, increasing the allure of local sources such as groundwater, rain and recycled supplies.

"It will further encourage retail water suppliers to use less imported water," said Edward Osann, a former federal water official who is a policy analyst for the Natural Resources Defense Council. "It's that simple."

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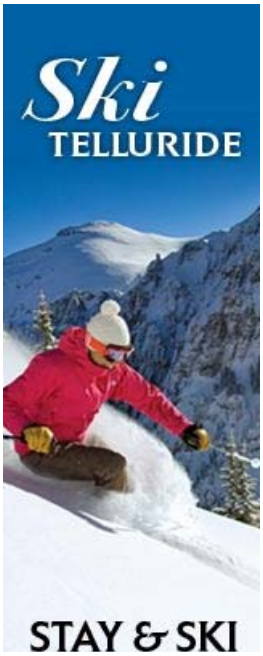

The 242-mile-long Colorado River Aqueduct is a monument to 20th century grandiosity, when Southern California's power brokers thought nothing of rearranging nature to serve their urban ambitions. It was constructed in the 1930s, when the region realized Los Angeles' Owens Valley supplies weren't enough to sustain its explosive growth.

The aqueduct was named a modern "civil engineering wonder" in 1955 by the American Society of Civil Engineers "because of its unprecedented cost, length, pumping rate and lift" as well as difficult construction conditions.

Unlike the Los Angeles Aqueduct, which relies on nothing more than gravity to send supplies from the Owens Valley to L.A., the long straw that the MWD dipped into the Colorado River needs a boost.

To provide it, the Whitsett, Gene, Iron Mountain, Eagle Mountain and Hinds pumping plants were carved into mountainsides along the aqueduct's eastern portion. They lift the river water, in stages, 1,617 feet to keep it moving across the relatively flat desert.

On a September day, nearly 900 million gallons flowed from the aqueduct into Hinds, 150 miles east of Los Angeles. Built in the Art Moderne style, with a red tile roof, terrazzo floor and elegant light fixtures reflecting the agency's aspirations of watering a modern metropolis, the plant houses nine pumps.

Each is several stories tall and so finely calibrated that one of the original engineers boasted: "You can stand a nickel on end when I get done," said Alan Cross, an MWD pump plant specialist. "That's true today," he added, balancing one on a shiny green pump housing.

The State Water Project's California Aqueduct, which extends 444 miles from the Sacramento-San Joaquin Delta, relies on a series of pump stations to carry Northern California supplies to the Southland.

The most powerful, the Edmonston plant at the base of the Tehachapis not far from Grapevine, has 14 enormous pumps with a combined horsepower of more than 1 million. In what is described as the single longest water lift in the world, Edmonston heaves supplies 1,926 feet uphill to a series of tunnels that cross the mountains.

Simple math and figures from recent energy studies conducted for the state by the consulting firms GEI and Navigant show that during the last decade, the long haul from the Bay Area has on average annually consumed enough power to supply more than 600,000 single-family homes.

The water resources department knew when it was planning the state project that it would be an energy hog. A 1964 report concluded that the most economical power source would be a state-owned nuclear plant. It was never built.

About 14% of the project's power comes from the Reid Gardner coal plant near Las Vegas, which the state has contracted with for 30 years.

To cut its greenhouse gas emissions, the department is replacing the Reid electricity with power from a state-of-the-art natural gas plant in Lodi and with renewable energy. Veronica Hicks, chief of the project's power office, said the agency is also in partnership with the University of California to develop a solar farm on about 100 acres near Pearblossom.

The MWD imports 40% to 60% of the Southland's water supply. Rising energy costs are one of the reasons the district has increased its wholesale rates to Southern California water agencies 75% in the last six years and will continue to raise them, executives say.

The district also cites higher treatment costs, the expense of fighting an invasive mussel in the Colorado aqueduct, and payments for anticipated environmental and infrastructure projects in the Sacramento-San Joaquin Delta.

No one expects Southern California to stop importing water. But energy pressures, combined with

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environmental problems that are undermining the long-term reliability of imports, are reshaping policies.

The California Energy Commission is promoting water conservation and more efficient appliances to save electricity and cut the state's greenhouse gas emissions.

"If you save water, especially in certain parts of California where you're really dependent on imported water resources, that actually has a benefit to the energy sector as well," said Lorraine White, a senior specialist with the commission.

In Long Beach, the MWD's price hikes "are primarily driving us to expand our groundwater production," said Kevin Wattier, general manager of the city water department, which is continuing to emphasize conservation even though the statewide drought is over.

Officials in Los Angeles, which gets about half its supplies from the MWD, have calculated that it takes more than twice the power to ship water from Northern California than to recycle local wastewater with a sophisticated treatment process.

Jim McDaniels, senior assistant general manager of the L.A. Department of Water and Power, said the agency is scrutinizing the cost and associated carbon production of imported water versus local sources, including storm-water capture and cleaning up contaminated groundwater in the San Fernando Valley.

The city's strategic water plan calls for conservation and recycling to meet new demand, not more imports.

PHOTOS: Precious liquid cargo

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