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Public University System: University of California

With more than 40 years on the bleeding edge of sustainability and 189 LEED certifications across 10 campuses, the Golden State's public university system continues to demonstrate that green design is good design

By Matt Alderton

One can't help but wonder: Did California sell its soul for sunshine? The Golden State is beloved for its warm, dry summers and mild, wet winters. Its temperate climate, however, comes with a cost: The state is currently in the midst of a severe drought, and in the past, it has been victim to extreme pollution and perpetual energy crises. Even though they love their state, Californians are in constant jeopardy of one day losing it. Against this backdrop, the state's public university system must graduate students who not only can live with California's most pressing ecological challenges, but also help solve them. This charge influences how the **University of California** (UC) educates and operates and also how it builds.

"We are a university. Our students are our customers, and they have been the main driver behind a lot of our sustainability efforts," says UC director of sustainability **Matthew St. Clair**. "Because our students demand sustainability, we must integrate it throughout our operations in order to practice what we teach and to allow students to learn from the campus as a living laboratory of sustainability solutions." In fact, sustainability at UC began with students, who in 2002 launched the "UC Go Solar!" campaign, a yearlong effort to persuade the UC Board of Regents to adopt a comprehensive clean-energy and green-building policy, making UC a national leader in environmental stewardship. The campaign was successful. The Board of Regents voted unanimously to adopt a policy mandating renewable energy, energy conservation, and green building across the UC system the following year.

"When our green building policy went into effect in 2004, there was one LEED-certified project in the UC system, and that was the Bren School of Environmental Science and Management at UC–Santa Barbara," St. Clair says. "Ten years later, we have 189 LEED certifications, which gives you a sense of the scale and pace of change of sustainability at UC." The school system has saved $140 million on energy since the inception of its sustainability policy and currently boasts more than $28 million in annual avoided costs on its utility bills.

And yet, it's just getting started. "We have a new president, **Janet Napolitano**, who started in October 2013 and who has challenged our system to take things to the next level," St. Clair says. "At her first board meeting in November 2013, she announced an initiative to make UC the first major research university in the world to achieve carbon neutrality—and to do it by 2025. So, we've come a long way in the last 10 years, and our new president is challenging us to go even further in the next 10."

What makes UC's goals so impressive isn't just their ambitious scope, though planning an entirely net-zero campus—as the **Integral Group** is currently helping UC–Berkeley do at its satellite campus in Richmond Bay—is plenty ambitious. It's also the university's appetite for prominent architecture, evident in countless case studies from across UC's 10 campuses including UC–Irvine and UC–Merced, which illustrate how the UC system is responding to California's environmental imperatives: with smart thinking, challenging goals, and superior design.

Irvine's 'Platinum' Vision

You can't teach old dogs new tricks, the design community often assumes. UC–Irvine is proof that you can. Established in 1965, the 50-year-old campus doesn't just learn new tricks; it often originates them, according to associate vice chancellor and campus architect **Rebekah Gladson**, who says UC–Irvine's relationship with sustainability dates back to the early 1990s.

"There was no US Green Building Council and no LEED. Nobody focused on sustainability," she says. "And yet, our campus said at that point in time that we would beat Title 24 [California's energy code] by 20 percent. That was a completely unheard-of concept."

It was especially foreign to public research universities, whose campuses by nature are densely populated with large, energy-intensive buildings, such as research laboratories. "Irvine's energy bills at the time far exceeded the allocation of funds it received from the state for operations, and the utility deficit on campus was growing," says Gladson, who was hired in 1992 to lead a new era of energy-efficient building at UC–Irvine. "The only way we could address that energy deficit was if the buildings we built required less energy than what we were given funds for, netting savings that we could use to help offset the negative."

Because it embraced sustainability so early, UC–Irvine got a head start on green building that to date has yielded 22 LEED-certified buildings, including eight that are certified LEED Gold and 12 that are LEED Platinum. In fact, all new buildings at UC–Irvine must now be designed to achieve a minimum of LEED Platinum certification—even though the UC sustainability policy only mandates a minimum of Silver.

"We're told we must achieve Silver, but that's not good enough. And frankly, neither is Platinum. Ultimately, we want to be carbon neutral, which is something we're working toward right now," says Gladson, who adds that UC Irvine is beating the latest Title 24 energy standards by 30 percent. "Will it be hard? It will be really hard. But it's doable, and we're doing it."

What's more, they're doing it without sacrificing design quality. "People fear that when you set lofty sustainability goals, you have to sacrifice. That the design is going to be less than stellar, that you can't have both. We've proven that you can," Gladson says. "Our buildings are still award-winning, and every well-known architect still wants to design on our campus."

The secret to UC–Irvine's success is a highly integrated design-build process, which yields designs that are equal parts beautiful, functional, and sustainable. A recent example is the Paul Merage School of Business, Unit 2. Completed in the fall of 2014, it was designed by Seattle-based **LMN Architects**, which envisioned a LEED Platinum business school that blends indoor with outdoor spaces in order to achieve unique social objectives.

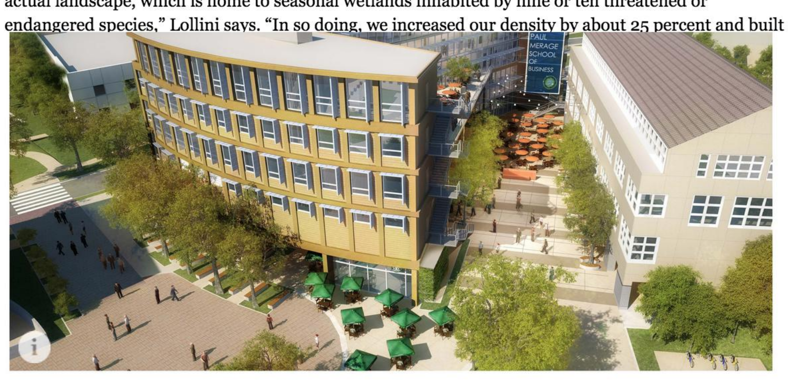
"A business school is interesting because it can sow the seeds of entrepreneurship and change the paradigm of how business occurs," says Gladson, who points to an outdoor courtyard that interfaces

The idea has since become reality, thanks in large part to UC–Merced's central plant, a 41,000-square-foot, LEED Gold-certified complex that produces, stores, distributes, and monitors utilities in order to help the campus achieve its principal energy goal: outperform Title 24 by at least 30 percent.

"All our energy systems go back to the central plant, which was the first operational building on campus," explains Lollini, who says the SOM-designed plant's key feature is a 2 million-gallon thermal energy storage tank that improves the energy performance of the buildings it serves. "We use the tank to chill water at night, which we then circulate on campus during the day to cool buildings."

Complementing the central plant is UC–Merced's master plan. Updated by Lollini when he assumed his current position in 2005, it configures the campus footprint in a compact manner that facilitates maximum energy efficiency—so much so that UC–Merced's newest buildings outperform Title 24 by as much as 50 percent.

"We developed a very broad perimeter road that acts as a buffer between the built environment and the actual landscape, which is home to seasonal wetlands inhabited by nine or ten threatened or endangered species," Lollini says. "In so doing, we increased our density by about 25 percent and built a



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A key feature of the master plan is a pair of high-density, mixed-use "Main Street" corridors that offer academic and public services on the ground floor, with housing up above.

"That's a significant differential between what we are developing and the classic campus development," Lollini says. "If you look at the master plan of the other UC campuses, they have an academic core that is solely for academic use, with housing areas on the periphery. Our campus mingles both in a highly compact way that allows us to build district heating and cooling and infrastructure systems, which are more and more being recognized as high-value in terms of achieving energy-efficiency goals for campuses."

Although UC–Merced is still taking shape, recent projects offer a preview of the campus that will thrive upon completion of its master plan in 2020. Take for instance its Housing 4 residence hall, a five-story, LEED Platinum-certified building that opened in the fall of 2013 with 525 beds and a large solar armature on its roof that soon will accommodate photovoltaic panels to reduce the building's overall energy consumption.

"It's a terrific piece of architecture," Lollini says of Housing 4, which was designed by San Francisco-based **EHDD Architecture**. "Because it's tall, it takes advantage of all its views back to and across campus, as well as out to nearby Lake Yosemite."

Another project of note is the LEED Platinum Recreation Center North project. Designed by San Francisco's **WRNS Studio**, it features a heavily insulated wall system that reduces heat load and maintains thermal stability within the building, shading systems on the windows, and a high-efficiency HVAC system.

"This was our first building designed to use 50 percent less energy than [Title 24], and we pulled it off," Lollini says of the project, which was completed in 2012. "We're still quite happy with the facility."

Next, UC–Merced plans to expand the capacity of its central plant to power its next wave of buildings, which in the next six years will double the campus's total square footage to approximately 3 million. With hope, the plant and increased solar infrastructure will help UC–Merced achieve its ambitious, long-term goal to become a "triple zero" campus—net-zero energy, water, and waste—by 2020.

"We're the tip of the spear," Lollini says. "We're leading the UC system, the UC system is leading the state, and the state, frankly, is leading the world in its aggressive approach to energy conservation and energy deployment."

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