News
EarthBeat



Catholic University of America students take measurements of the pastoral center for the Newark Archdiocese as part of a pilot course providing energy and sustainability recommendations to Catholic dioceses. (Patricia Andrasik)



by Brian Roewe

NCR environment correspondent

View Author Profile

broewe@ncronline.org

Follow on Twitter at @brianroewe

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At the beginning of the year, the Archdiocese of Newark, New Jersey, received a report on ways to improve energy use at its pastoral center.

The in-depth, 79-page slide deck provided analysis of the three-story administrative building's current energy demands and offered a range of possible upgrades, from simple steps like upgrading insulation to more complex solar installations. The report didn't come from the local utility or a solar developer or even the archdiocese's facilities manager. Instead, it was compiled by college students at Catholic University of America.

The students were part of a new CUA course on net-zero design — where a building produces enough energy to counterbalance the amount required to power it. But unlike most architectural classes, this one constructed hands-on sustainability instruction atop a foundation of theology and ethics, framed around why a building's energy and emissions footprint matters at all.



In the fall 2024 semester, the pastoral center of the Newark Archdiocese was the site of an energy audit conducted by students at Catholic University of America. The pilot course seeks to provide an energy and sustainability analysis to U.S. dioceses to reduce energy costs and greenhouse gas emissions. (Patricia Andrasik)

"It really has impacted the way that I see architecture and design ... [and] how decisions are impacting those immediately around you but also elsewhere," said Vincente Johnson, a second-year architecture graduate student and Catholic from Las Cruces, New Mexico.

The fall 2024 class was the pilot of a project that CUA and its collaborators plan to replicate in future semesters for other dioceses. They also hope it becomes a model for other Catholic schools to emulate.

"You can imagine the exponential impact that this would be on the environment and on our infrastructure if we had a course like this at every Catholic institution," said Patricia Andrasik, the course instructor and director of CUA's master of net zero

design program.

***Laudato Si*' studies**

The idea for the course — "Diocesan Assessment and Benchmarking" — traces back to conversations between Andrasik and the Catholic Climate Covenant about ways to help U.S. dioceses act on Pope Francis' 2015 encyclical "*Laudato Si*', on Care for Our Common Home," including measures to address climate change.

"We're trying to encourage bishops to look at the concept of net zero and how this is a great response to *Laudato Si*' and to the climate crisis," said Dan Misleh, founder and executive director of Catholic Climate Covenant, which provided funding for the course.



Catholic University of America students take measurements of the pastoral center for the Newark Archdiocese as part of a pilot course providing energy and sustainability recommendations to Catholic dioceses. (Patricia Andrasik)

Climate change is driven primarily by the concentration of heat-trapping greenhouse gas emissions in the atmosphere, which are released from burning fossil fuels. In the U.S., commercial and residential buildings account for 31% of overall greenhouse gas emissions when factoring in the electricity they use.

Through its Laudato Si' Action Platform, the Vatican has encouraged Catholic institutions at all levels to consider renewable energy and energy conservation as a means of responding to Francis' calls for greater action to preserve creation. In addition, the Holy See has set a goal of net-zero greenhouse gas emissions no later than 2050.

While some U.S. dioceses have made energy upgrades and installed solar power, others have trailed behind. Just 32 of the 195 U.S. dioceses have enrolled in the Laudato Si' Action Platform. Only one, the Diocese of Lexington, Kentucky, has set a diocese-wide net-zero goal.

Related: US bishops discuss Laudato Si' for first time in nearly a decade

Catholic Climate Covenant has explored ways to get more dioceses engaged, especially around energy. Tools like energy benchmarking and net-zero assessments are often necessary first steps, but the associated cost can be an obstacle.

Enter Catholic college students.

"We thought if we can encourage students to do that, that's going to lower the cost quite a bit," Misleh said. "They'll learn something along the way, and a diocese could get a relatively inexpensive — in this case free — assessment for some of their buildings with the students doing all the work."

Catholic University's School of Architecture and Planning proved an ideal partner.

The school in Washington, D.C., already has been blending design principles with Catholic social teaching, including sustainable building practices that protect the planet and make better use of its resources. Last summer, it flipped the switch on a 7.5-megawatt solar array. The size of 19 football fields, it's the largest in the nation's capital.

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Covenant staff pitched the course idea to bishops during a February 2024 meeting in San Diego on amplifying the U.S. church's response to *Laudato Si'*. Among those intrigued by the idea was Newark Cardinal Joseph Tobin.

Last summer, the archdiocese issued its own *Laudato Si'* action plan for parishes and Catholic institutions in the northeastern New Jersey area. It also formed an environmental justice task force and worked to connect parish green teams.

The CUA course offered a way to build on those efforts, and to demonstrate the archdiocese's commitment not only to *Laudato Si'* but also to young Catholics committed to both the church and environmental concerns.

"How is it that we could try to take the vision of *Laudato Si'* and look at our own energy conservation with that?" said Fr. Timothy Graff, director of social concerns for the archdiocese.



Catholic University students Jacelyn Andrawes and Olivia DiMattio review blueprints of the pastoral center of the Newark Archdiocese during a site visit in October 2024 to conduct an energy audit as part of an architectural course at Catholic University of America. (Patricia Andrasik)

Theory of energy ethics

Jacelyn Andrawes was among the 12 students who enrolled in the first iteration of CUA's net-zero class. A junior architecture major, she was intrigued by the course description and by its lack of prerequisites. But even her adviser wasn't sure what to expect.

"It was a pilot course. No one had any idea how this was gonna end," she said.

For many of the students, the opportunity for hands-on learning was appealing.

"You're taking whatever knowledge that you gain and applying it, where most classes you don't get to that point," said Johnson, who aims to graduate in May.

The course was broken into four parts, with the first portion focused on the theological ethics of energy and climate change. Leading those class sessions was Dan DiLeo, a moral theologian at Creighton University, which was a third partner in the course.

Related: Every bishop should decarbonize his diocese — and other Catholics can help

While CUA's architecture school requires an ethics course for its majors, students in the net-zero class said its theology lectures helped deepen their understanding of how church teaching relates to sustainability and its real-world applications.

"Your [architectural] project doesn't exist in a vacuum. Decisions that you make impact other people, whether you can see it or not. And I think really putting your decisions into that scope can make a big difference," Johnson said.

Olivia DiMattio, a first-year graduate student from Scranton, Pennsylvania, said the ethics discussions, including on Francis' rebukes of overconsumption, reinforced climate change as part of what it means to be pro-life.

"We are here to steward the environment … and if all of our buildings are consuming so much energy and resources, we're not doing that," she said.



Melissa Kazanci, a graduate dual student at Catholic University of America pursuing a Master of Architecture and a Master of Science in net zero design, takes photos of blueprints of the Newark Archdiocese's pastoral center as part of an energy audit. (Patricia Andrasik)

Catholic architectural application

During the net zero class's second phase, students pivoted from moral discussions to training on how to conduct an energy audit. They heard and learned from

speakers with the U.S. Environment Protection Agency's Energy Star program, Constellation Energy and Interfaith Power and Light.

Once equipped with ethics tools and technical skills, the students traveled in October the 220 miles by school van north to Newark to conduct the energy audit and carbon emissions benchmarking.

On site, they surveyed the grounds of the pastoral center and cathedral and met with staff. From there, they divided into teams, with some students gathering information from past utility bills and others scanning blueprints, recording measurements, taking photos and examining its mechanical systems to create a digital model of the building.

"We had to weave through all these drawings very, very carefully, because they were on sheets of, like, real paper," DiMattio said.

For Andrawes, the stakes of what they were doing loomed larger than a typical class assignment.

"It was more of a huge responsibility," she said. "If you mess up, if you take a wrong measurement, if you do anything that you know is not right, or even like a genuine mistake, it's not just a bad grade that you're getting. You can mess up the whole results of the project."

Once back on campus, the students used their data to create the digital model that they fed into energy simulation software. They identified outdated equipment and devised possible upgrades along four tiers, from basic behavioral changes to advanced renewable energy installations. During a November virtual meeting, they presented their findings and recommendations to the archdiocese.

Their analyses found that the pastoral center already was above the national average in Energy Star's performance scorecard. A recent switch to LED lights helped reduce the building's energy use.

Still, they found that a number of changes could make sizable differences in energy use and costs. Increasing insulation and installing exterior shades would reduce energy demand, while upgrading the current HVAC system could reduce energy use per square foot by 22%, net carbon emissions by 13%, and energy costs by 3%. Upgrading or expanding its two rooftop solar arrays, which supply 5% of its energy, would also bring savings and significantly lower the building's carbon emissions.

Related: Pope launches project to get Vatican to run solely on solar power

Graff said the archdiocese remains in the early stages of reviewing the students' recommendations and assessing which ones it might implement.

Looking forward, the instructor Andrasik is preparing to offer the course again in the fall. She and the Covenant team are exploring new funding streams, including the World Resources Institute, to expand the course beyond Catholic University of America. A collaboration with the Catholic Conference for Facility Management is in process.



A new course at the Catholic University of America blends theological ethics and energy audit training for architectural students as they work with a client, a Catholic diocese, to identify energy and sustainability measures to take in line with Pope Francis' calls for greater care for the planet. (Patricia Andrasik)

"The U.S. Catholic Church educates millions of students across [its] colleges and universities. … What this class offers is an actual laboratory for both the remediation of our facilities, a, and b, for the education of our students, all aligned within the same goals of environmental ethics for the greater glory of God," she said.

Students in the pilot course already see the benefits of their real-world experience working with a client, in this case the Newark Archdiocese.

"It's something that usually students don't really get exposed to unless they actually graduate and move on to work in a company or something," Andrawes said.

DiMattio has recognized overlap with the work she and her classmates did as she prepares to take the exam for LEED professional accreditation, or Leadership in Energy and Environmental Design. Beyond her future career, she said the course has offered a tangible example she can use to bridge disconnects that some perceive between their Catholic faith and environmental sustainability.

"In that sense, having the education to show people that, 'No no, this is actually beneficial, and it's also in line with what we teach in the church,' is wonderful."