



CASE STUDY | NAU International Pavilion 10 Year Review

POST OCCUPANCY: NAU'S INTERNATIONAL PAVILION

A net-zero academic and events building at Northern Arizona University, ten years on and what this moment can teach the next decade of campus design.

Northern Arizona University's International Pavilion has spent a decade proving a crucial thesis: the most sustainable building is often the simplest one. Here's what its data — and the people who run it — taught us.

In a corner of the Northern Arizona University campus, a modest building does something quietly radical: it heats, cools, lights, and ventilates itself with very little help from the grid. And that's a good thing.

NAU's International Pavilion opened in 2015 as a LEED Platinum, net-zero-energy assembly hall, the home of the university's International House and a gathering place for students from around the world. Ten years later, we now have a decade of operating data, a set of candid lessons from the people who run it, and a story that lands squarely in the middle of the pressures reshaping higher education today.

RSP set out to tell that story. As our Director of Sustainability, Linnea Brudenell, put it in the project's initial interview, the goal was to "live in the house of brutal honesty" and to celebrate what works without papering over what doesn't. What follows is the result: a building that has largely lived up to its promise and a renewable system that revealed the limits of "install-and-forget." NAU is now using both to think about its next ten years.

ABOUT RSP

Founded in Minneapolis in 1978, RSP Architects has emerged as one of the country's most trusted, diverse and agile architecture practices.

The firm's clients are a dynamic cross-section of Fortune 100 global brands and retailers, innovative start-ups, thoughtful non-profits, government agencies, and more.

THE INTERNATIONAL PAVILION

PROJECT AT A GLANCE	
Location	Flagstaff, Arizona (NAU, ~7,000-FT elevation)
Type	International House events center & assembly hall
Size	~10,000 SF; main hall partitionable into three
Completed	2015
Certification	LEED Platinum; net-zero site energy design
On-site energy	35 kW rooftop photovoltaics; solar tubes; passive ventilation; radiant floor heating
Performance	~54% less energy and ~42% less water than a baseline building, 100% reduction in potable water used for irrigation.

PART OF A LONGER ARC

NAU’s sustainability commitments did not begin with this building. In the late 1990s the university developed the Ponderosa Model, an approach to weaving sustainability across degree programs that are still taught in higher education today. NAU was an early signatory of the national college and university presidents’ climate commitment, adopted its first Climate Action Plan in 2009, and made LEED Silver certification the baseline standard for new buildings on campus. Its applied-research and development building, completed in 2005, earned LEED Platinum and was, for a time, fully operational at net-zero using complex building systems. It was described as one of the greenest buildings in the world.

That lineage is vital because leadership is cumulative. The Office of Sustainability, led by Chief Sustainability Officer Erik Nielsen, now coordinates the university’s Carbon Neutrality Action Plan and

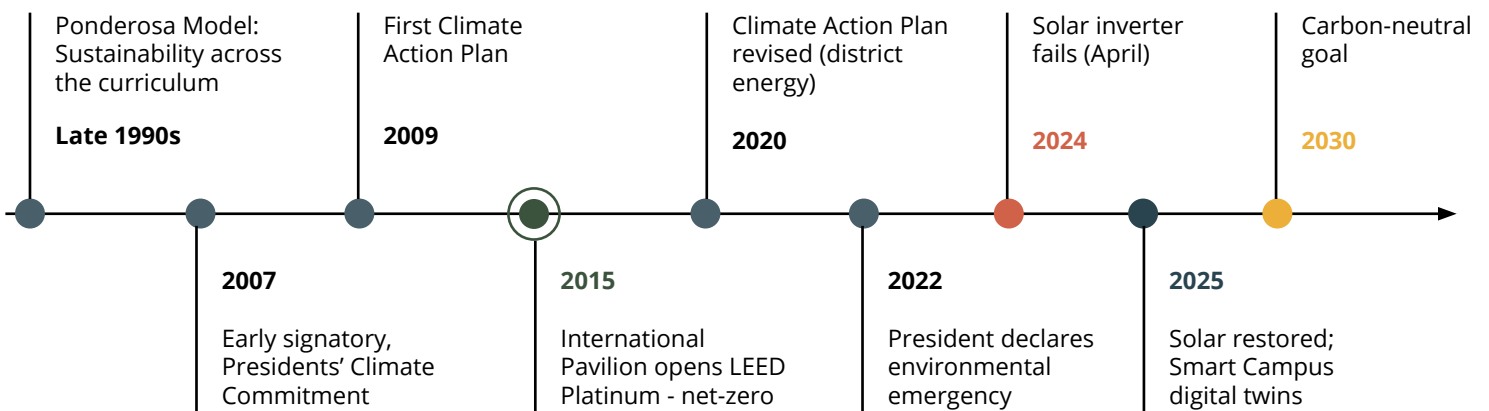
its goal of carbon neutrality by 2030. He frames the whole campus as a “living laboratory” and uses sustainable design to test and prove systems adoption, helping earn the NAU campus an Association for the Advancement of Sustainability in Higher Education (AASHE), STARS Gold rating.

In 2022 the university’s president declared an environmental emergency, based on the global ‘weirding’ that is occurring, with Flagstaff facing climate challenges including a decades long drought, declining forest health and wildfires, ensuing flooding and mudslides, less predictable monsoon storms and paradoxically more extreme precipitation. The Pavilion is one visible chapter in a much longer arc at NAU — a place where an on-campus pilot solar wall, once proven, gave the institution the confidence to build a five-story solar wall on its next project.

“Leadership matters. The DNA of sustainability at NAU carries forward into everything new we build.”

— Dr. Dylan Rust

A TRADITION OF SUSTAINABILITY LEADERSHIP AT NAU



A SIMPLE BUILDING.

A COMPLICATED MOMENT

Sitting at roughly 10,000 square feet, The Pavilion is small and intentionally simple. Its main hall divides into three rooms, so a single banquet space becomes three meeting rooms; a few offices sit upstairs. That flexibility is the point. As enrollment patterns shift, NAU is working hard to optimize space, and adaptable rooms are far easier to keep useful than highly specialized ones.

And the patterns are shifting. After years of fast growth, enrollment at NAU has flattened at roughly 28,000 students across all campuses and online, with about 20,000 in Flagstaff. The university is now redistributing occupants and taking a sizable building offline, rather than pay to heat and cool space it cannot justify. The pressures are familiar

across the country's higher education campuses and, importantly, non-partisan: questions about the cost and value of a degree; long-running declines in state investment that the team noted cut across red and blue states alike; the post-pandemic shift toward hybrid work and online instruction (NAU now sees roughly a 30/70 split between online and in-person course offerings); and a national demographic dip in college-age students that is sharper in the Midwest and Northeast than in the Southwest.

Layered on top is the international dimension that gives this building its purpose. International students are a structural part of higher education's financial model, with many paying full tuition and

“Our infrastructure isn’t quite as flexible as our people are.”

— Erik Nielsen
Chief Sustainability Officer
NAU

then some. Shifts in federal immigration and student-visa policy have made it harder for them to enroll. The team was blunt about the math: each prospective international student who cannot obtain a visa is not only a lost full-paying student but, indirectly, pressure on the seats available to in-state residents. A building conceived to anchor NAU’s growing international community now also stands as an indirect barometer of that community’s changing fortunes.

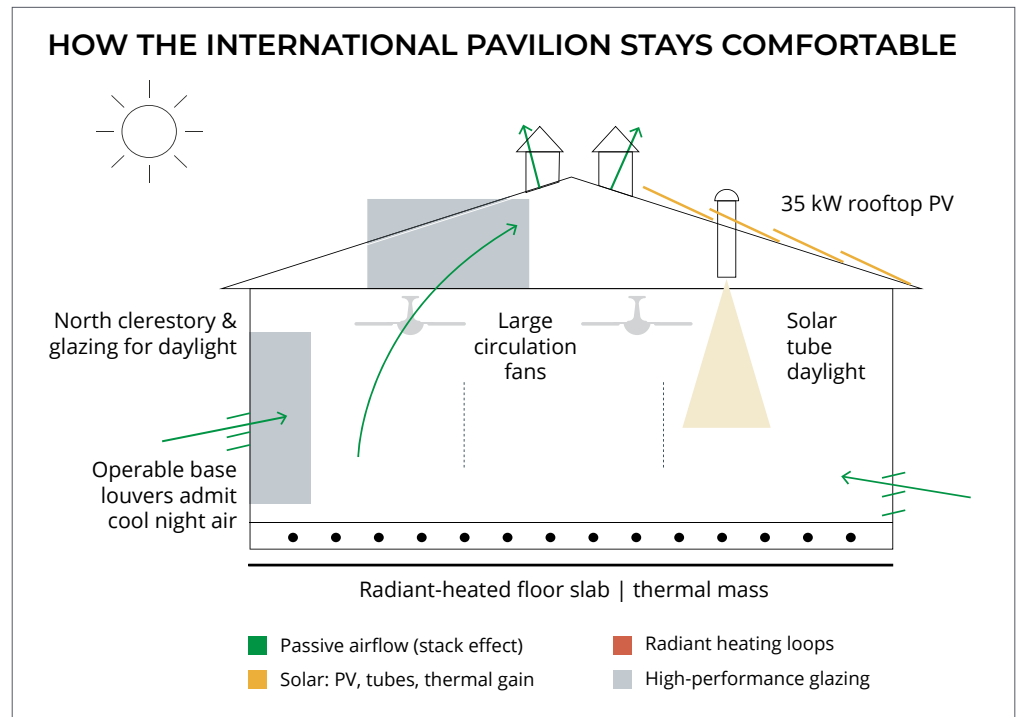


Figure 1. How the Pavilion stays comfortable: passive stack ventilation, thermal mass, radiant heating, daylighting, and a rooftop array — a deliberately legible set of systems.

SUSTAINABILITY YOU CAN FEEL — NOT A CHECKLIST

Walk in on a warm afternoon and the building tells you how it works. Operable louvers around the base draw in cool air; gravity hoods at the ridge let warm air rise and escape; large ceiling fans keep it all moving. On Flagstaff’s high plateau, where temperatures can swing 35 degrees in a single day, that diurnal cycle is a gift: pull in cold night air, use the concrete floor as thermal mass, and coast through the afternoon. The result is a hall that cools itself almost without mechanical air conditioning, with the exception being reserved for one small, specific need.

Heat comes from hot-water pipes run underfoot, a radiant floor whose manifolds are left visible in the entry foyer so the building serves as a living example of sustainable building systems. Daylight pours in through solar tubes and high north clerestory glazing, reducing the need for artificial lighting. A 35-kilowatt rooftop photovoltaic array supplies power; foam insulation and double-paned, argon-filled windows hold the envelope. Per the university’s published figures, these choices cut the building’s energy use by roughly 54 percent and its water use by about 42 percent using motion-

“The design is so simple. This building has been functioning really, really well, with very few issues, I think because the design is so simple.”

— Erin McAnally-Trejo
Energy & Water Conservation Manager
NAU

BUILDING ELECTRICITY DEMAND
VS. ON-SITE SOLAR GENERATION

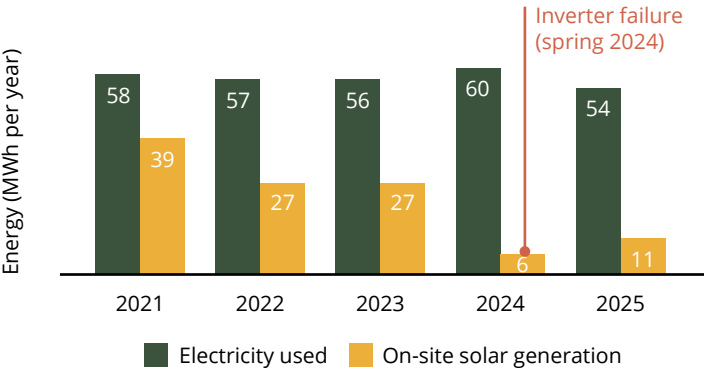


Figure 2. On-site solar covered a majority of the building’s small electricity load in 2021, then dropped sharply after the 2024 inverter failure.

Source: NAU sub-metered utility data, 2021-2025

sensing faucets, and low-flow fixtures and potable water reduced by 100% using reclaimed water from roof-drainage and an on-site filtration pond,

None of this is futuristic technology, and that is the design philosophy talking. “Sustainability is not checklists,” our team noted. “It’s not a LEED project, it’s every project.” The Pavilion’s strength is that its systems are legible and durable. The people who keep it running can understand it, and a building you can understand is a building you can actually maintain.

TEN YEARS OF DATA

The Pavilion was designed and certified to operate at net zero, creating a very low energy load paired with on-site generation. The sub-metered utility data the team assembled (electricity and solar from 2020–21 onward; natural gas and water back to the building’s opening in 2015) lets us see how that promise has aged.

Start with the load. The building’s electricity demand is modest and stable, standing at roughly 54 to 60 megawatt-hours a year, small for a 10,000-SF assembly building. In its healthy years, the rooftop array offset a large share of it: about two-thirds in 2021 and close to half in 2022 and 2023. As Dayna McKay, the team’s data analyst, described the early life of the building, “it consumed next to nothing, and what it did consume, it produced, and then that starts to of fall off.”

That “fall off” has a cause, and it is the building’s most important lesson. In spring 2024, on-site solar generation collapsed to almost nothing after an inverter failure, likely from a lightning strike. The monthly record makes the cliff unmistakable: steady seasonal generation through March 2024, then a flat line near zero for roughly 17 months, with generation restored in September 2025.

MONTHLY ON-SITE GENERATION, 2021-2026

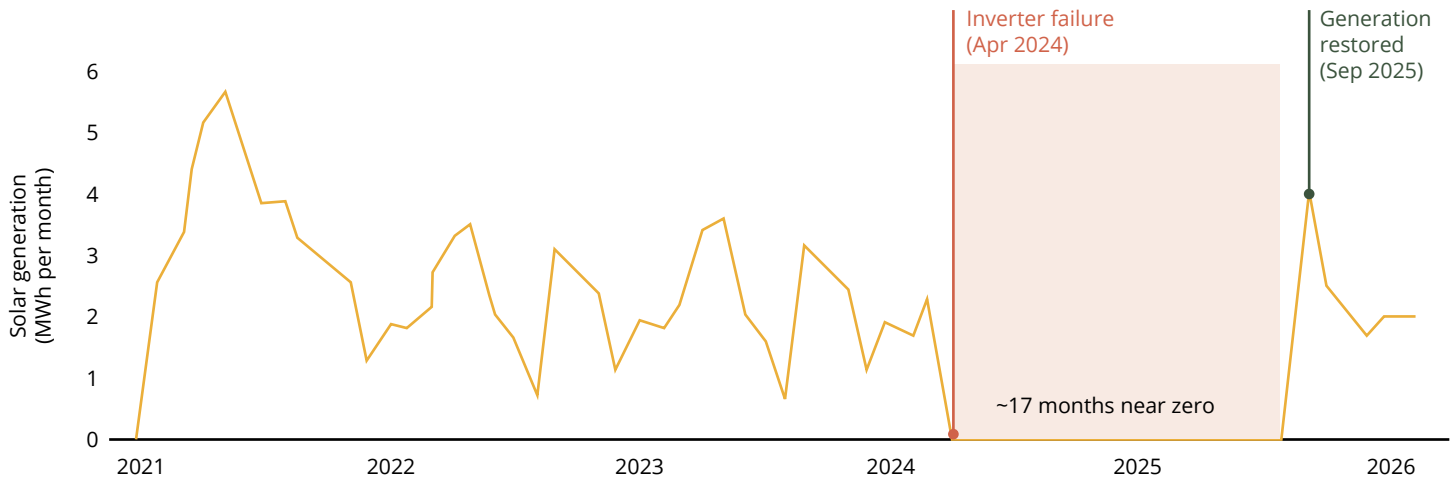


Figure 3. Monthly solar generation, 2021-2026. The spring 2024 inverter failure and the long detection-and-repair gap are visible at a glance.

Source: NAU submetered solar PV data

The most sobering detail is not the failure itself but how long it went unnoticed. By the team's own account, it took about a year to discover that the array had gone dark. Of the three inverters, one is fully dead; the other two had shorted and, until recently, required a technician to physically climb up and reset a breaker roughly once a week to keep producing.

The plan now is to replace all three and "harden" the system, so it no longer needs to be coaxed back to life. A cohort of our Director of Sustainability, part of a regional sustainability council, works in energy and may help NAU pursue grant or procurement funding to upgrade the array. Or perhaps this case study will generate alumni interest and funding. Thankfully, the panels

themselves, now a decade old, are well within their useful life and appear to be working as intended.

Heating tells a complementary, weather-driven story. Natural gas use for the standalone boiler runs in the range of about 4,000 to 5,500 therms a year and tracks winter severity closely. The clearest signal is the most recent: amid a record-warm, low-snow winter — essentially zero snowpack on the mountain that should hold a hundred inches — the building burned roughly 60 percent less gas in February 2026 than in the same month in recent years. Water use, meanwhile, has stayed low and unremarkable since the conservation systems settled in. The building is, in the team's phrase, embracing the reality of how it actually performs.

ANNUAL NATURAL GAS USE FOR HEATING

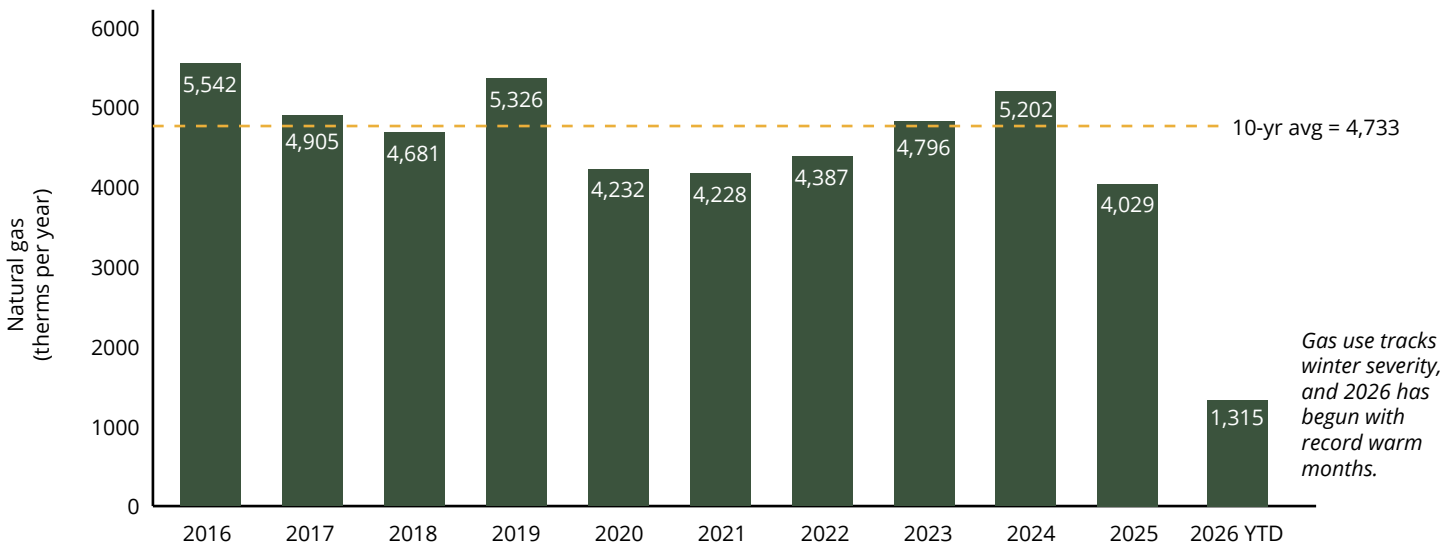


Figure 4. Annual natural gas use for heating. Demand follows the weather. Note: The unusually mild winter of 2026 stands out.

LESSONS WORTH CARRYING FORWARD

Asked the awkward question, *What would you do differently?* The team was candid. Three themes stand out.

1. Connect to the district system, or plan for the day you wish you had

About half of NAU's buildings tie into a central district-energy system fed by two plants — one producing hot water, one steam. The Pavilion does not; it has a standalone natural-gas boiler. A decade ago, with the connection point far away and a costly tunnel required, a standalone system was the assumed and cheaper default. But as the university works to decarbonize its district energy and revisits each standalone building for electrification at end of life, that early cost decision looks like a missed opportunity. The takeaway for new work, including a nursing school now in early design, is to evaluate life-cycle operating cost and the decarbonization path up front, not just first

cost. Sitting, as the campus does, atop ancient volcanoes, geothermal is firmly on the table for the future.

2. A sustainable feature you can't maintain isn't sustainable

The inverter saga is one instance of a broader pattern the team has watched play out across campus: ambitious, complex systems that degrade because the institution can't maintain them, because of both losing legacy maintenance staff over time and slowly losing specialized in-house knowledge, or the budget for outside specialists, to keep them running. Trade turnover erodes institutional knowledge; an override here, a locked-out control there, and a once-innovative building gradually becomes ordinary. The Pavilion has largely escaped this fate precisely because its systems are simple. Its more complex sibling, the applied-research and development building, is the cautionary tale.

“A lot of this stuff that’s supposed to be sustainable, if it falls apart, it usually just stays that way.”

— Erin McAnally-Trejo
Energy & Water Conservation Manager
NAU

3. Make the building tell you when something breaks

The year-long blindness to a dead array is exactly the challenge NAU’s emerging “smart campus” is meant to solve. The university is building digital twins of roughly twenty buildings and piloting controls that let individual HVAC zones turn down when no one is there. This way, buildings stop running 5 a.m. to midnight, seven days a week, in spaces occupied a fraction of that time. The first goal is simply awareness: know when something has fallen apart. A leak in the Forestry building over winter break in 2025, for example, went unnoticed and destroyed thesis work, university property, computers and years of research, emphasizing the urgent need for a new system. Consequently, the smart campus will also embrace leak detection. The second is the in-house capacity to fix it. Funding this work is its own challenge. Efficiency commissioning is, as the team wryly observed, “not the sexiest thing to get alumni to support,” even when the cost of a new hire or preventive maintenance is recouped quickly.

A LIVING LABORATORY AND A STORY WORTH TELLING

For all the lessons, the Pavilion is fundamentally a success, and an unusually useful one. It functions day to day as the events center for the International House, a community of domestic and international students living in Campus Heights, and increasingly as a revenue source,

rented to outside groups for everything from summer conferences to, one could easily imagine, a community salsa night or an international folk festival. Its building manager, Dr. Dylan Rust, who also directs International Student Retention and Inclusion, sees its flexibility and the continuity of its program identity as central to its success; the same simplicity that keeps it running keeps it welcoming. Fittingly, NAU now hosts its Sustainability Leadership Awards in this building, because it is a great example of green architecture doing its job.



It also works as proof of concept. When City of Flagstaff facilities and sustainability staff toured the campus, what impressed them was not a single widget or complex highly technical mechanical system. Instead, it was the project’s simplicity, building design and willingness to take risks, prove a concept, and build on it. That is the real argument the Pavilion makes: not that every building should look like this one, but that experimentation, done simply, measured honestly, and maintained, pays

THE INTERNATIONAL PAVILION



off. As the team described it, the building is “an incubator, serving as a living laboratory.”

There is a communications lesson here too. Sustainability teams at NAU, the group admitted, tend to keep their heads down rather than promote their work; meanwhile peer institutions have become experts at telling their own stories. With enrollment under pressure and prospective students placing real value on sustainability, a credible, well-told account of a building like this one in earned media, circulated to alumni and the wider community is an important facet of communications strategy. The Pavilion is a cool building doing cool things, and saying so plainly, with the data to back it, is part of the work.

The phrase above captures the paradox of designing in our changing climate. Design teams must design for both the current climate, and the one the building must endure over time.

“It’s not just global warming, it’s global weirding.”

— Dayna McKay, M.S.
Data & Reporting Analyst | Office of Sustainability,
quoting Dr. Erik Nielsen,
Chief Sustainability Officer, NAU

“Global weirding” captures the trends. We are not experiencing a smooth warming, but rather a destabilized normal, of vanished snowpack and accelerating freeze-thaw cycles that work moisture into envelopes never meant to take it. Designing for that future is hard, and no building gets everything right. But a simple, legible, well-instrumented, and honestly evaluated building gives an institution its best chance to adapt the space, to catch the failures, and to carry the lessons into whatever it builds next. Ten years on, that is exactly what the International Pavilion is doing.

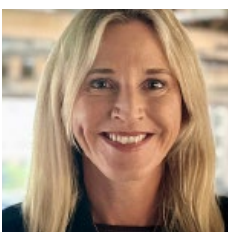
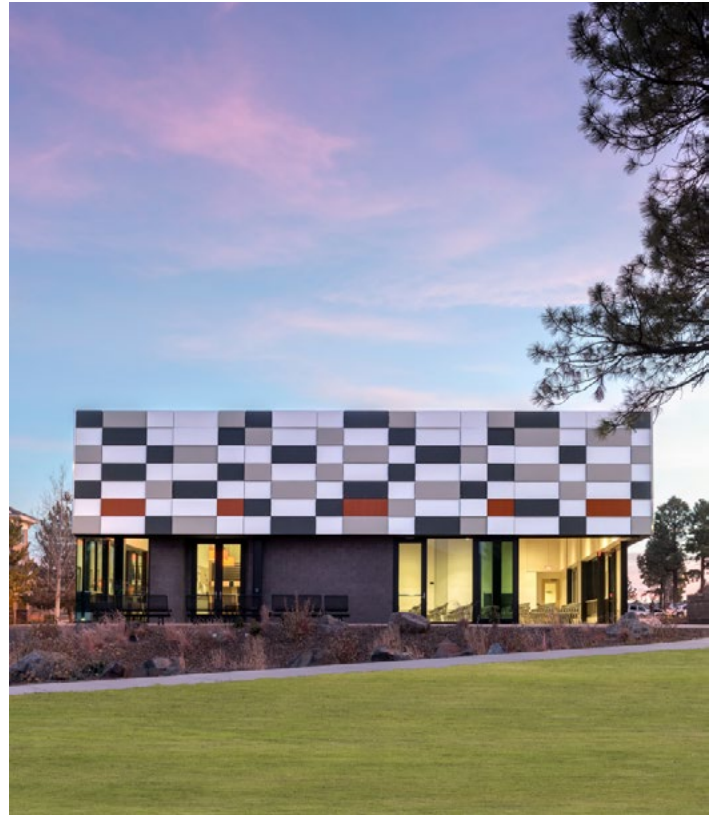
Because of its location, NAU is directly impacted by wildfires, drought, and other complex climate shifts. It also sits squarely amid the pressures reshaping higher education. Flattening enrollment, the shift toward hybrid and online learning, and the constraints on international enrollment are affecting the financial model of nearly every university campus across the country. That is exactly why the story is worth telling.

Listening to the lessons our buildings whisper, and sometimes shout, is essential to our practice as architects and designers.

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ACKNOWLEDGMENTS CREDITS & SOURCES

- Interviews (April 2026):** We are thankful for the time, insight and help of NAU's incredible team:
Dr. Erik Nielsen, NAU's Chief Sustainability Officer and professor of Environmental Science & Policy, (NAU Climate Action Plan, university-wide sustainability policy, sustainability academics, carbon neutrality by 2030)
Dayna McKay, Data & Reporting Analyst for the Office of Sustainability;
Erin McAnally-Trejo, Energy & Water Conservation Manager for the Office of Sustainability;
Dr. Dylan Rust, Director of International Student Retention and Inclusion and Pavilion building manager.
It has been their stewardship that has kept the building in remarkable condition.
- Data:** NAU sub-metered utility records: electricity, solar PV, natural gas, and water, 2015–2026, prepared by the NAU Office of Sustainability. Charts and diagrams by RSP.
- References:** NAU Office of Sustainability — <https://in.nau.edu/green-nau/office-of-sustainability/>
About the International Pavilion, NAU Center for International Education — <https://in.nau.edu/center-international-education/international-house/pavilion/about-us/>
- NAU alumni | Stories like this one are part of NAU's path to carbon neutrality by 2030. They are a reminder of what makes a Lumberjack education distinctive. Learn more at in.nau.edu/green-nau/office-of-sustainability
- The International Pavilion can be used for meetings, retreats, events, conferences, and more. It is available to students, faculty, staff, and external organizations. They can customize any event with options like catering, ticketing, and custom floor plans. For more information, email: international.pavilion@nau.edu or call 928-523-6111 to schedule an event.



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