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Official Publication of The Chief Engineers Association of Chicagoland  
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JUNE 2023

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### CARES ACT

The Coronavirus Aid, Relief, and Economic Security (CARES) Act closed a loophole that was included in the TCJA by making QIP 15-year property. This change made businesses of all sizes, regardless of the amounts spent on equipment, eligible to deduct the full cost of commercial fire sprinkler systems using bonus depreciation.

The time is now to upgrade your building's fire safety with a fire sprinkler system or a sprinkler retrofit. Under the new Section 179 guidelines, the one year deduction period phases out after 2022. Any new sprinkler system or retrofit completed between September 27, 2017 and December 31, 2022 will be able to be fully expensed in one year. After 2022, the allowed deduction percentage is as follows:

2021: 100%	2023: 80%	2025: 40%
2022: 100%	2024: 60%	2026: 20%

2027 and after: The depreciation schedule becomes permanently set at 15 years.

### WHAT IS QIP?

The Tax Cuts and Jobs Act (TCJA), passed in December, 2017, gave small businesses the ability to deduct the full cost of Qualified Improvement Property (QIP) up to \$1.04 million in the year of installation using Section 179.

QIP is defined as improvements to the interior of an existing building that is not residential property. Commercial fire sprinkler systems, including upgrades of existing systems or retrofitting in existing structures, are considered QIP.

The Section 179 deduction is not phased out over time. However, there is a phase out of the amount allowed as a deduction based on a maximum spending amount of \$2.59 million on equipment in a year. Businesses that spend over that amount will see a dollar for dollar reduction of their eligible deduction. So a business that spends \$3.63 million or more on equipment in a given year would not be allowed any Section 179 Deduction.

### WHAT HAS CHANGED?

Prior to the TCJA allowing Section 179 on qualified improvement property, including sprinkler systems, property of this type was only allowed a deduction on a straight line basis over a period of 39 years. In other words, a company spending \$390,000 on a commercial sprinkler system prior to the TCJA would only deduct \$10,000 per year for 39 years.

While many believe that the intention of Congress was to make Qualified Improvement Property 15-year property, which would have made this property eligible for bonus depreciation, the TCJA left the life of this property at 39 years. So, a taxpayer who did not elect to use the Section 179 Deduction or who has that deduction phased out would have been left to depreciate the remaining balance of the assets over a 39-year period.

Neither of these deductions is currently available for fire sprinkler systems installed in residential high rises. The National Fire Sprinkler Association (NFSA) continues to fight to obtain incentives for residential structures.

For more information on how these tax incentives might impact the business of your contractors, we would recommend that they contact their tax professionals, as situations differ based on the facts and circumstances for each business. As a general rule, we would not recommend that the Local provide tax advice to the contractors.



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## 38 COVER STORY: Air Comfort Builds on Reputation as Leading Chicago Mechanical Contractor



Air Comfort continues to grow and expand, including adding plumbing to its array of services.

## 30 Proper Coil Cleaning Reduces Energy Costs and Improves Overall Operations



Now is the time to make sure your HVAC systems coils are clean and running as efficiently as they can. Here are a few best practices to follow as you proceed to this very important task.

## 50 At the Core of Control System Design Are Standards, Standards and Standards



Distributed Control Systems are at their best when they're designed with a consistent philosophy and best practices in mind.

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Dear Members,

Once again, the weather cooperated with us and we were blessed with a great day for our annual May BBQ event. So many of you came out to be a part of this event, and it was great to see such support. Thank you to Local 399 for the use of its back lot for hosting this event. Thanks to Hill Group and Aero Building Solutions for bringing us the popular cigar bar, our bar sponsors Contech and Parkway Elevators, and our barbecue sponsors Air Comfort and Neuco for making this one of the best May barbecue picnics in memory. We are truly lucky to have such great Associate Members supporting the CEAC. To all of our Active Members: Remember these and all of our supporting organizations when you need new products or outside services — they're even better supporting us onsite.



June brings us to the last event on our yearly calendar before the summer break, which is the CEAC Hosts the Chicago White Sox event at Guaranteed Rate Field. Blocks of 10 tickets are available for \$2,000, and include tickets to the Fan Deck, beer and food. There are a limited number of tickets available, so reach out to Tom Phillips at [tphillips@iuoe399.com](mailto:tphillips@iuoe399.com) for ticket reservations.

Even as the summer break approaches, we are already thinking ahead to our Chief Engineers' 83rd Annual Golf Outing. It's the most popular event of the year, and a long-standing tradition out at Cog Hill. This year's event will take place on Friday, Sept. 8th, with a 9:00am shotgun start, as usual. Reach out to Kevin Kenzinger at (312) 296-5603 and/or Brendan Winters at (773) 457-6403.

Even before the scorching heat of summer arrives, you'll want to be thinking about performing preventative maintenance on your heating systems in advance of fall, so now is a great time to make that happen. And, as always, remember to keep in mind our Associate Members, who are so good at what they do, when you need to reach for outside assistance or new products to support your building systems.

In the meantime, before we adjourn for the summer, remember to have a happy and safe July 4th, and let's keep in mind our first responders and the men and women of the military for their dedication to protecting all of us.

Have a great summer!

Sincerely,

Ken Botta

# IN BRIEF

## Charges Dismissed Against Ex-Public Works Official in Flint, Mich., Water Scandal

FLINT, Mich. (AP) — A judge dismissed charges Monday, May 22, against a former local official in Flint, the last of nine people to benefit from a state Supreme Court decision that struck down a series of indictments in the city's lead-in-water scandal.

Howard Croft was public works director when state-appointed managers in 2014 switched Flint's water source to the Flint River. The water wasn't treated to reduce corrosion on old pipes, a disastrous decision that caused lead to contaminate the system for at least 18 months.

Croft was charged with two misdemeanor counts of willful neglect of duty. But the state Supreme Court in 2022 said a one-judge grand jury can't issue indictments.

Judge William Crawford dismissed the case against Croft, who had pleaded not guilty.

"Today's dismissal, after years of an unnecessary, costly and misguided prosecution, is both the legally correct and just outcome for Mr. Croft," defense attorney Alex Rusek said.

Despite the court's unanimous decision nearly a year ago, the attorney general's office has been trying to keep charges alive against nine people, including former Gov. Rick Snyder, claiming the cases could simply be refiled in another form.

It's been a losing argument so far, but state prosecutors still haven't given up. They're trying to get the Supreme Court to take yet another look. Appeals are pending.

Flint returned to a regional water system in 2015.

## Oklahoma Lures Enel Solar Panel Manufacturing Facility With \$180M Incentive Package

OKLAHOMA CITY (AP) — Enel North America announced Monday, May 22, that it plans to build a solar cell and panel manufacturing facility in eastern Oklahoma that would employ about 1,000 people after the Legislature agreed to a \$180 million incentive package to help lure the company.

The company will invest \$1 billion in the project, which includes the construction of a 2 million-square-foot solar photovoltaic cell and panel manufacturing facility that will have an annual production capacity of 3 gigawatts, it said in a statement. Construction on the massive facility is expected to begin in the fall in Inola, Oklahoma, which is located about 27 miles east of Tulsa.

"Our selection of Oklahoma is a testament to the strength of the Tulsa Port of Inola site, the state's commitment to workforce development and an attractive investment climate," said Giovanni Bertolino, head of Enel North America's affiliate 3Sun USA.

The decision was announced after the Legislature and Gov. Kevin Stitt agreed to provide the company with \$180 million in tax rebates if the company reaches certain benchmarks over the next several years. In order to qualify for the entire \$180 million, the company would have to spend at least \$1.8 billion in qualifying capital expenditures and create 1,400 permanent new jobs.

Oklahoma also agreed to spend more than \$38 million on water and wastewater system upgrades to the inland waterways in the region, including at the Port of Inola.

## Attorneys Agree to Pause Federal Litigation for Water Violations in Mississippi's Capital

JACKSON, Miss. (AP) — Attorneys for the federal government, Mississippi and the state's capital city have agreed to request to delay litigation from a complaint filed by the U.S. Environmental Protection Agency that said the city wasn't meeting standards for providing reliable drinking water.

In a Wednesday, May 17, court filing, government attorneys asked for a six-month stay, which would be the second such order. It's part of a broader federal push to fix Jackson's water system, which nearly collapsed last summer and continues to have problems with broken pipes and leaks.

In November, the Justice Department filed a complaint on behalf of the U.S. Environmental Protection Agency, arguing that Jackson has failed to provide drinking water reliably compliant with the Safe Drinking Water Act. An agreement between federal officials and the city put that litigation on hold for six months.

U.S. District Court Judge Henry Wingate then appointed Ted Henifin, who spent 15 years managing a sanitation district in Virginia, to manage Jackson's water system on an interim basis.

The situation in Jackson required the Justice Department to respond with the "greatest possible urgency," Attorney General Merrick Garland said after the department announced it would intervene to help improve the water system.

"We realize how horrible the circumstances are there," Garland said. "It's hard to imagine not being able to turn on a tap and get safe drinking water."

## Work on Maine Hydropower Transmission Line Can Restart, State Says

LEWISTON, Maine (AP) — The construction of a 145-mile transmission line in Maine will be able to resume now that the state has removed a suspension order on the project.

The New England Clean Energy Connect project is no longer suspended, as it had been since fall 2021, the Maine Department of





Environmental Protection said May 16. The department's ruling came less than a month after a jury said that developers had a constitutional right to proceed with the \$1 billion transmission project.

The project is designed to supply up to 1,200 megawatts of Canadian hydropower to the New England power grid. That is enough electricity for about a million homes.

However, state voters opposed the project in an election, and work stopped. Opponents of the project have cited environmental concerns and said the potential benefits of the transmission line were overstated.

The parent company of Central Maine Power, the state's largest utility, and Hydro Quebec have collaborated on the project. It was unclear exactly when the work would resume. The Maine Department of Environmental Protection said it needs notification of a date at least five days before the operations restart.

## Oil to Renewables: Hawaii Utility Aims to Transform 85-Year-Old Power Plant

HONOLULU (AP) — Hawaii's largest electric utility aims to transform an 85-year-old, oil-fired power plant into one that will run on renewable energy.

Hawaiian Electric plans to replace six oil-fueled generators at its Waiau Power Plant in Pearl City outside Honolulu with smaller generation units powered by fuels like biodiesel and possibly hydrogen, the Honolulu Star-Advertiser reported Friday, May 19.

The state Public Utilities Commission must approve the plan. It will also consider competing proposals by independent power companies.

In 2014, Hawaii became the first state in the U.S. to require its electric utilities to generate 100 percent of their power from renewable sources. Utilities must reach that threshold by 2045. As of last year, Hawaiian Electric generated 32 percent of its energy from renewable sources.

Hawaiian Electric declined to say how large the new Waiau power plant would be or how much it would cost ratepayers, citing the competitive-bidding process.

The plant's existing infrastructure would provide cost savings and limit effects on the community, it said.

If the company's plan is approved, the utility expects to have initial replacement generation units ready for use in 2029.

The 500-megawatt Waiau plant is the second-largest power production facility on Oahu. Only the utility company's oil-fired Kahe Power Plant in Waianae is bigger, at 650 megawatts.

Other fossil fuel facilities in Hawaii are also undergoing transformation. AES Corporation, the company that operated a now-closed coal-fired power plant on Oahu, has said it may turn the site into an

energy storage farm that uses batteries to store power generated by solar and wind.

## Judge Rejects Lawsuit by Nantucket Residents to Block Wind Turbines, Protect Right Whales

BOSTON (AP) — A federal judge has rejected a lawsuit brought by Nantucket residents who argued that the planned construction of dozens of wind turbines off the affluent resort island threatens the survival of endangered Northern Atlantic right whales.

Nantucket Residents Against Turbines said Vineyard Wind's proposed project of some 62 turbines in waters 14 miles south of the island is in a crucial area for foraging and nursing for the dwindling species, which researchers estimate to number about 340.

In a ruling issued Wednesday, May 17, U.S. District Judge Indira Talwani found the group failed to show that either the U.S. Bureau of Ocean Energy Management or the National Marine Fisheries Service violated the Endangered Species Act or the National Environmental Policy Act in issuing a 2021 biological opinion or final environmental impact statement for the wind energy project.

Vineyard Wind CEO Klaus Moeller welcomed the decision.

"We're pleased the court has acknowledged the rigorous and thorough administrative review that our project underwent over the last many years," Moeller said in a statement. "We remain committed to working with all stakeholders so that we can continue to set the highest possible standards on this first in the nation project."

## Kerry Challenges Oil Industry to Prove Its Promised Tech Rescue for Climate-Wrecking Emissions

WASHINGTON (AP) — Oil and gas producers talk up technological breakthroughs they say will soon allow the world to drill and burn fossil fuels without worsening global warming. U.S. climate envoy John Kerry says the time is here for the industry to prove it can make the technology happen — at scale, affordably and quickly — to stave off climate disaster.

And Kerry says he has "serious questions" whether it can.

Kerry's comments came in an interview with The Associated Press on one of the most crucial topics in the fight to slow global warming: the argument from oil and gas producers that they will soon have technology in place to extract the climate-damaging gases that make fossil fuels the main culprit in climate change, allowing companies to keep pumping crude and natural gas worry-free.

Kerry said the ideal solution is a fast global switch to renewable energy, but oil and gas states and companies have a right to give their claim of technological rescue a try. ■■



# NEWS

## Wield the Power to Electrify Your Facility

By Andrew Lehrer, ESD

Building electrification in commercial properties continues to generate headlines, whether as part of the effort to mitigate climate change or driven by upcoming Securities and Exchange Commission (SEC) reporting requirements. While the planning process for fully electrified new projects is typically the focus of these pieces, owners and operators of existing assets play a critical role in the evolution. Existing facilities provide significant embodied carbon reduction compared to building new assets, an advantage that is critical to capture when forecasting future reductions in emissions. While 100 percent electrification may not be feasible, a significant climate impact can be achieved with hybrid electrification that balances capital expenditure (CapEx), operating expenses (OpEx), and the need for future flexibility with the often-challenging logistics of existing facilities.

Electrification retrofits in heating-dominant climates can be particularly challenging. There is a large inventory of buildings that are imminently due for major infrastructure upgrades; many of these, particularly those designed before the mid-20th century, were not designed with electrification in mind. Operators of these facilities understand the inherent challenges of updating central infrastructure, and many of the prevalent electrification strategies are not direct replacements for existing technologies. Retrofits of these systems must therefore include a feasibility analysis of deploying passive energy management strategies in addition to equipment replacement.

While strategies such as major envelope modifications may be costly and/or logistically infeasible, addressing energy drains related to envelope tightness, stack effect management, lighting and controls, operational setbacks, and retro-commissioning of existing mechanical, electrical, and plumbing (MEP) systems can significantly reduce the energy demand of a building. Once existing efficiency is optimized, costly retrofits using modern heat pump technology can be more efficiently deployed in conjunction with existing capital improvement plans.

Heat pumps differ from typical gas-fired or electric-resistance heating systems. They move, rather than generate heat, and can provide up to four units of energy output for every one unit of energy input. However, it's important to understand that air-source heat pump efficiency decreases as outside air temperatures drop, putting their efficiency roughly on par with electric resistance heating when outdoor temps drop below freezing. Considering the U.S. average electricity rate is approximately three times the cost per unit of energy as natural gas (see Table 1), relying solely on air-source heat pumps may substantially increase OpEx and may not even be technically feasible.

Existing facilities often have limited space, limited capital, and need to maintain existing operations so as not to disrupt their customers. As a further challenge, the reduction in efficiency noted above coincides with reduced capacity to generate the heating hot water temperatures required by many existing central systems. This is where building operators can leverage their detailed knowledge of

Name	Electricity Retail Price (cents/kWh)	\$/therm	Natural Gas Retail Price (cents/kWh Equiv.)	Cost Factor for Elec
<b>U.S. Average</b>	<b>11.1</b>	<b>\$ 1.09</b>	<b>3.7</b>	<b>3.0</b>
Arizona	10.73	\$ 1.04	3.6	3.0
California	19.65	\$ 1.56	5.3	3.7
Colorado	10.9	\$ 1.09	3.7	2.9
Georgia	10.43	\$ 1.09	3.7	2.8
Illinois	10.14	\$ 1.50	5.1	2.0
Michigan	12.93	\$ 0.96	3.3	4.0
New York	16.11	\$ 1.00	3.4	4.7
North Carolina	9.29	\$ 1.19	4.0	2.3
North Dakota	8.65	\$ 0.93	3.2	2.7
Tennessee	9.78	\$ 1.11	3.8	2.6
Texas	9.14	\$ 1.13	3.9	2.4
Vermont	16.34	\$ 0.84	2.9	5.7
Wisconsin	11.01	\$ 0.93	3.2	3.5

Table 1: Sample of Retail Energy Rates for Commercial Assets (Source: US Energy Information Admin - 2022)

their facilities to work effectively within these bounds.

Environmental Systems Design (ESD) recommends a “bridge solution” whereby heat pumps are selected and operated for a significant majority of operating hours while gas-fired or electric resistance heating is activated during peak heating periods. In many cold climates, operating hours below freezing (32°F) can constitute fewer than 25 percent of the approximately 6,000 annual heating hours and often occur during unoccupied hours when operational setbacks are in place. Using a bridge approach, significant operational carbon reductions are realized by heat pump operation during the majority of operating hours (which optimizes the heat pump plant installation), while significantly less costly and space-intensive gas-fired technology (refer to Figure 1) can be deployed in a limited fashion to address peaking load demands.

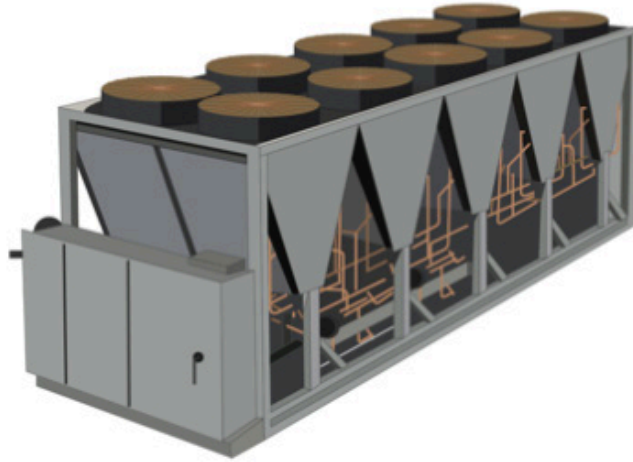
A current electrification project for a financial services client in New York includes augmenting the existing building glazing and retrofitting the existing heating/cooling plant with 600 tons of geothermal capacity. The combination of these strategies reduced the facility's peak heating load by over 40 percent, allowed the use of lower heating hot water supply temperature, and will allow the geothermal system to satisfy approximately 85 percent of the facility's heating hours. The capital costs of both the glazing upgrade and geothermal system are anticipating substantial Federal Investment Tax Credits under the Inflation Reduction Act of 2022.

Further leveraging the operator's knowledge of the existing facility, this strategy can be phased and implemented over time with the availability of capital or to align with leasing activity. Even where a central heating plant serves multiple tenants, part of the plant can be upgraded with the associated cost, energy and carbon reduction metered and allocated to a specific tenant.

Although 100-percent electrification should be the goal in the



## Air-to-Water Heat Pump



28 ft L x 8 ft W x 8.5 ft H  
13,500 lbs

## Boiler



4 ft L x 3 ft W x 6 ft H  
2,100 lbs

Figure 1: Heat Pump vs Boiler Footprint

coming years, it is not always feasible in an existing facility. The development of an incremental electrification plan that includes strategically deploying bridge solutions like those detailed above can provide many positive impacts. It is critical for operators to have a full understanding of the costs, incentives, logistics, and planning requirements prior to proceeding. With thoughtful planning, many existing facilities can realize significant operational carbon reductions while increasing their value and marketability and setting them up for long-term viability. 🏠

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mechanical, electrical, plumbing, fire protection, life safety, structural and technology engineering.

He focuses on life sciences, major real estate asset repositioning/ adaptive re-use, corporate headquarters, and high-rise markets. He is a licensed Professional Engineer in Illinois and California, an Executive Board Member of ACE Mentor Chicago, and a longtime member of ASHRAE.

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# NEWS

## 10,000 Bridges Similar to Pittsburgh One That Collapsed Should Be Checked for Corrosion, Report Says

By Josh Funk | Associated Press

Investigators looking into the collapse of a Pittsburgh bridge want transportation officials nationwide to examine more than 10,000 other bridges with similar construction to ensure they don't have the same kind of corrosion that was found on the bridge that collapsed.

The National Transportation Safety Board said in a report Thursday, May 18, that drainage problems on the weathered steel bridge that failed allowed the metal legs to deteriorate over time. It determined Pennsylvania neglected for years to perform the maintenance needed to clear the debris, dirt and leaves that were causing the problem, even though inspectors noted the issue.

Rust that caused the deterioration of the Pittsburgh bridge's steel legs and allowed holes to form in the structure was noted on every inspection done since 2005, including one completed just four months before the Fern Hollow Bridge collapsed on Jan. 28, 2022. Work was done in 2009 to clear the debris clogging the bridge's drainage system, but that wasn't repeated in the years since even after inspectors said in every report between 2011 and 2021 that the drains had become clogged again.

Pennsylvania Department of Transportation spokeswoman Alexis Campbell said the agency is still reviewing everything the NTSB released May 18, and the state will continue cooperating with the investigation. Last fall, the state Transportation Department issued a safety bulletin focused on the maintenance issues with these steel bridges in response to the NTSB's preliminary findings.

"Safe, reliable infrastructure is a top priority of the [Gov. Josh] Shapiro administration, and we are committed to ensuring Pennsylvanians and all motorists can travel across the Commonwealth safely," Campbell said. "To that end, PennDOT remains proactive in its review, analysis and maintenance of its bridges."

The Pittsburgh bridge span that fell last year dropped a bus and four cars some 100 feet into a ravine, injuring several people hours before President Joe Biden visited the city to promote a massive infrastructure law. The span carried Forbes Avenue over Frick Park, Fern Hollow Creek and Tranquil Trail.

A new bridge opened to traffic in December after its design and construction were fast-tracked.

The NTSB said that these kinds of steel-frame bridges can last for decades if they are properly maintained. But in the Pittsburgh case, the drainage issues kept the steel from developing a protective patina that would have kept the corrosion at bay. Investigators looked at 10 similar bridges in Pennsylvania and found similar maintenance problems, although none were as severe as the Fern Hollow Bridge.



This is a Pittsburgh Transit Authority bus that was on the Fern Hollow Bridge in Pittsburgh when it collapsed in this file photo from Jan. 28, 2022. Investigators looking into the collapse of the Pittsburgh bridge last year want transportation officials nationwide to closely examine more than 10,000 other bridges with similar construction to make sure they don't have the same kind of corrosion that was found on the bridge that collapsed. (AP Photo/Gene J. Puskar, File)

It's not clear how widespread these issues are nationwide. But the NTSB wanted to urgently call them to bridge owners' attention even though it hasn't completed its investigation of the Pittsburgh bridge collapse.

The NTSB said in its report that it's critical for bridge owners, usually cities and states, to clear "accumulation of water and debris on bridges with weathering steel components."

The agency wants the Federal Highway Administration to help bridge owners identify similar problems and complete the needed bridge safety work. The Federal Highway Administration said it will review the NTSB recommendations and work with bridge owners to review inspection reports and determine what needs to be done. ■■



# Danfoss to Power All North America Facilities with Solar Energy by 2025

With an eye toward achieving its global decarbonization goals, Danfoss North America recently signed a power purchase agreement with CIG Capital, a U.S.-based project financing firm, to purchase about 75 MW of solar power from a solar farm in Texas, starting in 2025. The initial agreement term is 12 years, allowing Danfoss to fully replace its annual electricity usage in North America with green energy through at least 2037.

The new agreement will provide Danfoss with green certificates, signifying that they are supplying the North American electrical grid with the full amount of green electricity needed to power all 24 factories and 36 locations in North America, and will reduce Danfoss' carbon footprint in the region by 75 percent.

"As part of our ESG goals, Danfoss has committed to achieving carbon neutrality across our global operations by 2030," Soren Revsbech Dam, Head of ESG and Decarbonization, Global Services Real Estate, at Danfoss says. "This agreement to secure green energy for our North America operations will reduce our global emissions by 21

percent. This is not only a significant step in our journey to becoming carbon neutral, but it also demonstrates that we are serious about putting sustainability at the heart of our business."

CIG Capital will build the six-square-mile farm in the panhandle region of Texas. Groundbreaking is scheduled for November 2023, with the farm becoming fully operational by spring of 2025. The solar farm capacity is projected to be 509 MW of solar power, of which Danfoss will utilize 15 percent.

The next focus for Danfoss in its decarbonization journey will be on reducing and reusing energy across its North America locations, employing various Danfoss technologies, such as oil-free, variable-speed compressors and other heating and cooling solutions that support heat recovery and energy efficiency.

"Danfoss is committed to playing a leading role in the energy transition," Rick Sporrer, President of Danfoss North America says. "Meeting our ESG goals and living up to our commitment to combat climate change means developing innovative solutions."

As part of the Science Based Targets initiative (SBTi), Danfoss is committed to become carbon neutral in its global operations (scope 1 & 2) by 2030, and says it will reduce its value chain emissions (scope 3) 15 percent by 2030. This commitment is included in the targets of Danfoss' three step-change initiatives on Decarbonization, Circularity, and Diversity, Equity and Inclusion.

Already Danfoss has seen progress in decoupling environmental impact from business growth by delivering 7 percent decrease in scope 1 and 2 emissions while growing 15 percent organically in 2022.

Additionally, the 250,000 sqm Danfoss headquarters campus site in Denmark became carbon neutral in 2022. Carbon neutrality was achieved through energy-saving projects, utilization of excess heat from processes and data centers, sourcing of green energy, and offsetting residual emissions.



Danfoss's commitment to solar energy marks another milestone toward commitment to decarbonize operations by 2030.



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# NEWS

## Biden Administration Announces Nearly \$11 Billion for Renewable Energy in Rural Communities

By Drew Costley | AP Science Writer

The U.S. Department of Agriculture announced a nearly \$11 billion investment on Tuesday, May 16, to help bring affordable clean energy to rural communities throughout the country.

Rural electric cooperatives, renewable energy companies and electric utilities will be able to apply for funding through two programs, U.S. Department of Agriculture Secretary Tom Vilsack said during a media briefing Monday, May 15.

Vilsack said it was the largest single federal investment in rural electrification since President Franklin D. Roosevelt signed the Rural Electrification Act in 1936 as part of the New Deal.

"This is an exciting opportunity for the Rural Utility Service to work collaboratively with our great partners, the Rural Electric cooperatives, in order to advance a clean energy future for rural America," Vilsack said. "So this is an exciting and an historic day, and it continues an ongoing effort to ensure that rural America is a full participant in this clean energy economy."

The Empowering Rural America program will make \$9.7 billion available for rural electric cooperatives to create renewable energy, zero-emission and carbon capture systems.

Jim Matheson, CEO of the National Rural Electric Cooperative Association, praised the administration for the investment.

"This is an exciting and transformative opportunity for co-ops and their local communities, particularly as we look toward a future that depends on electricity to power more of the economy," Matheson said. "USDA has smartly structured this program in a way that will help electric co-ops leverage new tools to reduce costs and keep energy affordable while meeting the future energy needs of their rural communities."

The Powering Affordable Clean Energy program will make \$1 billion available in partially-forgivable loans for renewable energy companies and electric utilities to help finance renewable energy projects such as large-scale solar, wind and geothermal projects.

The Department of Agriculture said in a press release that the goal of this program is provide affordable clean energy to vulnerable, disadvantaged and Indigenous communities. But there is tension between building a clean energy infrastructure for all and mining the materials needed for that infrastructure.

For example, conservationists and Indigenous communities in Nevada have sued to block the opening of the largest mine planned in the U.S. for extraction of lithium used in electric vehicle batteries.

When asked about tribal concerns about mineral extraction at the May 15 briefing, Vilsack said there would be a "significant tribal consultation" for mining projects on land his agency controls. But when pressed about what would happen if an Indigenous community said no to a mining project, he declined to answer the question, calling it hypothetical.

Rural electric cooperatives can apply for grants, loans and loan modifications through the Empowering Rural America program between July 31 and Aug. 31. The application period for the Powering Affordable Clean Energy program is June 30-Sept. 29.

Experts told The Associated Press that these programs could have a significant impact for rural America. "The ERA Program has the potential to help rural electric co-ops and municipal co-ops move the needle toward a cleaner, less carbon-intensive electricity mix,"

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Wind turbines work at sunset on a wind farm near Del Rio, Texas, Wednesday, Feb. 15, 2023. The U.S. Department of Agriculture announced a nearly \$11 billion investment on Tuesday, May 16, to help bring affordable clean energy to rural communities throughout the country. (AP Photo/Eric Gay, File)


said Felix Mormann, a professor of law at Texas A&M University who specializes in energy law and policy.

The programs will have relatively less impact on electricity growth in rural communities than the Rural Electrification Act during the New Deal, said Carl Kitchens, an associate professor of economics at Florida State University.

“When enacted in the 1930s, only 10 percent of farms had electric power; by 1950, it had risen to over 90 percent,” Kitchens said. “Today, electricity is nearly universal except for a few small pockets and portions of reservation land.”

Funding for the new programs comes from the Inflation Reduction Act, which has generated hundreds of billions of dollars for renewable energy transition and environmental cleanup. In February, the Biden administration announced details on how states and nonprofits could apply for \$27 billion in funding from a “green bank.” The next month, officials announced \$2 billion to create the Rural Energy for America Program.

And since the beginning of the year, they’ve announced hundreds of millions of dollars for the renewable energy transition from climate-warming fossil fuels, environmental cleanup and climate mitigation in poor communities and communities of color. ■■



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# NEWS

## Valmet to Convert Coal-Fired District Heat Boiler to Pellet-Fired BFB Boiler at Helsinki Power Plant

ESPOO, Finland /PRNewswire/ — Valmet is to convert Helen Ltd's coal-fired district heat boiler to bubbling fluidized bed (BFB) combustion to enable wood pellet firing at the Salmisaari 'A' power plant in Helsinki, Finland. The conversion promotes the company's goal of phasing out coal and at the same time strengthens the construction of a sustainable energy system.

The order is included in Valmet's orders received of the second quarter 2023. The value of the order will not be disclosed. The converted boiler will be handed over to the customer in January 2025.

"Our goal is carbon-neutral energy production in 2030," says Juhani Aaltonen, responsible for Helen's sustainable energy solutions. "Sustainable bioenergy is part of the overall solution to achieve our goal. The versatile production structure ensures reliability of heat supply even in freezing weather. This project is an important step for us on the way to carbon neutrality. We trust Valmet's abilities to complete

this demanding project on time."

"Converting an existing coal-fired boiler to biofuel combustion is a quick and cost-effective way to transition from fossil to renewable fuels," says Niina Ollikka, Director, Energy Business Unit, Rebuilds and Conversions, Valmet. "Valmet has decades of experience of successful boiler conversions."

The project is a continuation of the good cooperation between Helen and Valmet. In 2018, Valmet started-up a 92 MWth pellet-fired heating plant at the Salmisaari power plant area, and during this year the heat recovery plant belonging to the Vuosaari bioheating plant will be completed.

Valmet is to convert Helen Ltd's coal-fired district heat boiler to bubbling fluidized bed (BFB) combustion at the Salmisaari power plant in Helsinki, Finland.

### Technical Information About the Delivery

Valmet's turnkey delivery includes a fuel conversion from pulverized coal to wood pellets on a hot water boiler. It will be modified to a bubbling fluidized bed boiler with a fuel capacity of 150 MW.

The delivery includes a flue gas cleaning system and a heat recovery system and modification to the Valmet DNA automation system, as well as all necessary auxiliary systems. After the conversion, the plant will produce district heat with extremely high efficiency — the flue gas temperature at the stack will be only 55.4°F. ☞



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Helsinki utility Helen Ltd's coal-fired district heat boiler will be converted by Valmet to enable wood-pellet firing, in accordance with Finland's drive toward its 2030 carbon neutrality goal. (Photo: Lennart Takanen)

# NEWS

## South Korean Experts Visit Fukushima Nuclear Plant Before Treated Water Is Released to Sea

By Mari Yamaguchi | Associated Press

TOKYO (AP) — A South Korean team of government experts commenced a two-day tour at the tsunami-wrecked Fukushima nuclear power plant Tuesday, May 23, to have a firsthand look of a controversial Japanese plan to release into sea treated by slightly radioactive wastewater.

Officials from the Japanese government and the plant operator, Tokyo Electric Power Company Holdings, were to escort the 21-member delegation to see several facilities related to treatment, safety checks, transport and dilution of the water, Japanese officials said.

The plan has faced fierce protests from local fishing communities concerned about safety and reputational damage. Neighboring countries, including South Korea, China and the Pacific Island nations, have also raised safety concerns.

The treated water discharge plan was particularly a sensitive issue between Tokyo and Seoul, which are now working to repair long-strained bilateral ties to address bigger challenges such as security threats of China and North Korea.

“We plan to provide thorough explanation to the South Korean experts as we show them the latest status of the tanks and construction at the plant,” said Trade and Industry Minister Yasutoshi Nishimura. “I expect this will deepen understanding in South Korea about the safety of our planned release” of the treated water.

Only the water treated to legally releasable levels and further diluted with large amounts of seawater would be released into sea about 0.6 mile offshore in the Pacific through an undersea tunnel, and safety procedures and a controlled release over decades will make it harmless to people and marine life, Japanese officials say.

Some scientists say the impact of long-term, low-dose exposure to tritium and other radionuclides is unknown and the release should be delayed.

Historical disputes have strained ties between Tokyo and Seoul — most recently over the compensation of wartime Korean forced laborers during Japan’s 1910-1945 colonization of the Korean Peninsula. But their relationship has thawed rapidly since March, when South Korea’s government announced a local fund to compensate some of the former laborers. Tokyo and Seoul, under pressure from Washington, share a sense of urgency to mend ties amid growing security threats in the region.

Nishimura said the government and TEPCO plan to start releasing the treated water after compulsory safety checks by the Japanese nuclear regulators and the final review report by the International

Atomic Energy Agency.

A massive earthquake and tsunami on March 11, 2011, destroyed the Fukushima Daiichi plant’s cooling systems, causing three reactors to melt, releasing large amounts of radiation. Water used to cool the cores has accumulated in about 1,000 tanks at the plant, which will reach capacity in early 2024.

Japanese officials say the water stored in those tanks needs to be removed to prevent accidental leaks in case of another disaster and to make progress on the plant’s decommissioning.



Members of the minor progressive Jinbo Party stage a rally against Japanese government’s decision to release treated radioactive water from Fukushima nuclear power plant, in Seoul, South Korea, Tuesday, May 23, 2023. South Korea sent a team of government experts to Japan on Sunday, May 21, to visit the Fukushima nuclear power plant where they will review contentious Japanese plans to release treated but slightly radioactive water into the sea. The signs read “Oppose to release treated radioactive water from the Fukushima.” (AP Photo/Ahn Young-joon)


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# Incredible Shrinking Lakes: Humans, Climate Change, Diversion Costs Trillions of Gallons Annually

By Seth Borenstein | AP Science Writer

WASHINGTON (AP) — Climate change's hotter temperatures and society's diversion of water have been shrinking the world's lakes by trillions of gallons of water a year since the early 1990s, a new study finds.

A close examination of nearly 2,000 of the world's largest lakes found they are losing about 5.7 trillion gallons a year. That means from 1992 to 2020, the world lost the equivalent of 17 Lake Meads, America's largest reservoir, in Nevada. It's also roughly equal to how much water the United States used in an entire year in 2015.

Even lakes in areas getting more rainfall are shriveling. That's because of both a thirstier atmosphere from warmer air sucking up more water in evaporation, and a thirsty society that is diverting water from lakes to agriculture, power plants and drinking supplies, according to a study in the May 18 journal *Science*.

Authors also cited a third reason they called more natural, with water shrinking because of rainfall pattern and river runoff changes, but even that may have a climate change component. That's the main cause for Iran's Lake Urmia to lose about 277 billion gallons a year, the study said.

The declining lakes don't mean places are suddenly going to go without drinking water, but it may lead to more competition for lake water, which is also used in hydroelectric power and recreation such as boating, the study authors said.

"More than half of the decline is primarily attributable to human consumption or indirect human signals through climate warming," said study lead author Fangfang Yao, a climate scientist at the University of Colorado.

The diversion of water from lakes — a direct human cause of shrinkage — is probably larger and more noticeable because it is "very acute, very local and it has the capability of really changing the landscape," said co-author Ben Livneh, a University of Colorado hydrologist.

But the indirect human shrinking, from warmer air due to climate change, "is this global blanketing effect that kind of affects everything or more places," Livneh said. California's Mono Lake is a good example of this type of shrinking, Yao said.

Even areas that are getting wetter because of climate change are losing lake water because hotter air is sucking more moisture out of



*A man stands on a hill overlooking a formerly sunken boat standing upright in the air with its stern buried in the mud along the shoreline of Lake Mead at the Lake Mead National Recreation Area, Jan. 27, 2023, near Boulder City, Nev. (AP Photo/John Locher, File)*

the lakes. And that means more water in the air, which can fall as rain or snow but "may end up falling as rain far away, outside the basin where it evaporated or even over the ocean," Livneh said in an email.

Yao, Livneh and colleagues used almost 30 years of satellite observation, climate data and computer simulation to figure out what's happening to lakes and found more than half of them have shrunk so much that it is statistically significant and not random.

In the United States, Lake Mead lost two-thirds of its water between 1992 and 2020, while the Great Salt Lake also shrank noticeably, Yao said. The Great Lakes dropped considerably from 1992 to 2013 then plateaued and then increased.

Another problem is that lakes are filling with sediment or dirt from upstream rivers.

Scientists have long known about the problems of climate change, diversion and sedimentation, "however the complete quantification of water storage variations for large lakes that Yao and colleagues provide is new" and it creates "a much more complete picture" than past research has, said University of North Carolina hydrology professor Tamlin Pavelsky, who wasn't part of the study.

It's likely to get worse as society looks for more water and more reservoirs with a growing population and a warmer Earth, said UCLA climate hydrologist Park Williams, who wasn't part of the study. ■■

# NEWS

## Researchers Examine Effects of Two Combustion Technologies on Coal-Fired Boiler Emissions

BUSAN, South Korea /PRNewswire/ — Coal-fired power plants have been in place for a long time to meet the global demands for power generation. Needless to say, there are environmental and human health concerns to be addressed on this front. While there are ongoing efforts to transition to renewable energy resources, coal-fired power plants may not become obsolete just yet. Against this backdrop, it is pertinent to explore how the efficiency of these coal-fired boilers can be improved while mitigating their harmful effects on the environment, namely greenhouse gas emissions, acid rain, and photochemical smog generation, and the human health.

To this end, various combustion methods like air and staging and swirl flow have been proposed. However, the efficacy of these technologies in mitigating the pollutant emissions while maximizing the burnout performance has remained unclear. Now, in a recent study made available online on Dec. 31, 2022, and to be published in Volume 268, Issue 1 of the journal *Energy* on April 1, 2023, an international team of researchers led by Prof. Gyungmin Choi of Pusan National University, Korea analyzed the effectiveness of combining swirl flow and air staging in improving the combustion performance and reducing pollution. “The exhaust tube vortex (ETV) structure accompanying the swirl flow improves flame stability and combustion performance, but has the disadvantage of generating a large amount of NOx emissions. In contrast, air staging technology creates a fuel-rich environment in the primary combustion zone, which has a positive effect on NOx reduction but negatively affects combustion performance,” explains Prof. Choi. “Therefore, if these two technologies are appropriately combined and applied in real life, a synergistic effect that reduces the emission of air pollutants as well as improves combustion performance can be expected.”

Accordingly, the team employed both simulations and experiments to study the combined effects of different swirl configurations and air staging within a 16-kWth retrofitted down-fired pulverized coal boiler. The coal boiler was composed of three sections: the swirl burner, the boiler, and the exhaust pipe. For staged combustion, staged air was divided into two sides and injected tangentially into the boiler. Liquefied petroleum (LPG) gas was used for preheating and flame stabilization. The staged-air and LPG flow rates were regulated, and for each setting, the temperature was measured using thermocouples. Additionally, the amount of gas-phase species was measured using a multi-gas analyzer.

Further, the team observed an even burnout zone for the co-swirling configuration, which ensured complete combustion of the fuel, reducing the gas species emissions. It also facilitated an increased conversion of chemical energy into thermal energy, boosting the combustion efficiency. In contrast, counter-swirling burners showed uneven coal particle distribution, uneven burnout, and increased NOx emissions, suggesting that a co-swirling configuration was

the better option. Additionally, the team showed that air staging technology reduced the environmental costs from \$0.003 to \$0.015 per day.

Overall, the insights from this study could prove to be extremely valuable in solving the environmental problems and health hazards related to coal-fired power plants. “We have identified and studied the structure and flame of the ETV for the first time, and will continue researching and striving to utilize it in the combustion-based industry,” concludes an optimistic Prof. Choi.

To read the paper, visit: [doi.org/10.1016/j.energy.2022.126591](https://doi.org/10.1016/j.energy.2022.126591)



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# Utah Allocates Millions to Prepare for Flood Damage After Wet Winter

By Sam Metz | Associated Press

SALT LAKE CITY (AP) — As the winter's record snowpack melted and cascaded down from the Rockies, Utah lawmakers recently set aside millions of dollars to prepare for potentially historic flooding.

The state is among the many in the American West confronting the wet winter's consequences, with many places ending the season with more than double the 30-year median measurements for snow-water equivalent, federal data shows. State and local officials from eastern California to western Colorado are anticipating runoff in the coming months drenching agricultural fields and battering infrastructure, with water overflowing out of creeks and reservoirs and running through city streets.

The spring's moderate temperatures have allowed snow to melt gradually and forestalled most danger and damage. But runoff has flooded neighborhoods throughout the Salt Lake City area, opening sinkholes and causing mudslides in residential streets. This week alone, some residents who live on northern Utah's Ogden River were evacuated, a flooded highway near Spanish Fork Canyon temporarily closed and hay planted along the low plains of the Bear River has been submerged underwater.

The flooding, though potentially damaging, is a welcome change for Utah officials more accustomed to dealing with the region's worst drought in at least 1,200 years. For Gov. Spencer Cox, it's an answer to prayers and public calls for divine intervention.

"If this has taught us anything," Rep. Mike Schultz, a Republican, said of the abnormally wet winter, "it's that the climate in Utah is truly unpredictable."

After a special session recently convened to extend Utah's state of emergency for flooding, lawmakers have allocated a total of \$40 million to combat flood damages. The money was drawn from sources including the state's general fund, transportation fund and funding earmarked for wildfire suppression. Republican Senate President Stuart Adams said he was unsure if the entire lump sum would be needed, but had planned conservatively, with memories of 1983 flooding that coursed through the streets of Salt Lake City still fresh.

Sen. Scott Sandall, a northern Utah Republican, said he was particularly concerned about areas like Snowbird in Little Cottonwood Canyon, where snow remains and no reservoir or dam exists at lower elevation to help manage it.

"We've got saturated soils, We've got runoff and a few flooding spots that we've been worried about," he said. "A 2-inch rain event across most of the state would change our perspective in an instant. Mother Nature is going to dictate how fast it comes down."



Local officials issued evacuation orders for at least 20 homes as temperatures spiked and snowmelt coursed through the streets on, April 12, 2023, in Kaysville, Utah. As the winter's record snowpack melts and cascades down from the Rockies, Utah lawmakers on Wednesday, May 17, set aside millions of dollars to prepare for potentially historic flooding. (AP Photo/Rick Bowmer)

Other states, including California, are also revising their budgets to confront flooding. ■■



# NEWS

## Criminal Cases for Killing Eagles Decline as Wind Turbine Dangers Grow

By Matthew Brown and Camille Fassett | Associated Press

ROLLING HILLS, Wyo. (AP) — Criminal cases brought by U.S. wildlife officials for killing or injuring protected eagles dropped sharply in recent years, even as officials ramped up issuing permits that will allow wind energy companies to kill thousands of eagles without legal consequence.

The falloff in enforcement of eagle protection laws accelerated in the Trump administration and has continued under President Joe Biden, according to U.S. Fish and Wildlife Service data obtained by The Associated Press.

It comes amid growing concern that a proliferation of wind turbines to feed the demand for renewable energy is jeopardizing golden eagle populations.

The findings underscore a Biden administration dilemma: Confronting climate change through clean power development requires trade-offs, such as more dead birds from collisions with wind turbines.

“They are rolling over backwards for wind companies,” said Mike Lockhart, a former U.S. Fish and Wildlife Service biologist who

researches eagles in Wyoming. “I think they are killing a hell of a lot more eagles than they ever anticipated.”

Turbines can tower 260 feet with blade tips spinning in excess of 150 miles per hour.

Companies often pledge to perform conservation work to offset eagle deaths. Some permits include direct payments for dead eagles — about \$30,000 per bird. Numerous permits allow the killing of bald eagles without compensation.

The Biden administration has proposed streamlining the process, making permits automatic in some cases, as they allow wind-energy projects and power line networks to harm eagles and disturb nests.

Some wind farms have relocated turbines or reduced their numbers to minimize deaths. But turbines continue to go up in areas frequented by golden eagles, and Lockhart said the cumulative impacts could be disastrous.

Turbines have killed at least six golden eagles Lockhart had previously trapped and tagged for research. One was killed about two



A camera system to detect approaching eagles is seen atop a pole at Duke Energy's Top of the World wind farm, on April 24, 2023, in Rolling Hills, Wyo. The company can shut down its huge turbines when eagles approach too closely, reducing but not eliminating fatal collisions after Duke was criminally prosecuted last decade for not adequately preventing eagle deaths. (AP Photo/Matthew Brown)

months after a wind farm started operating near its nest in 2021, he said.

“They’re going to more than double the [wind] capacity and in doing that, the impacts on wildlife, particularly golden eagles, are going to be exponentially going up,” Lockhart said.

Fish and Wildlife Service officials said they are working to avoid such a scenario by working with companies to reduce bird deaths. “We expect the final number to be much smaller,” spokesperson Vanessa Kauffman said.

There have been a small number of high-profile prosecutions of wind companies that continued killing eagles despite prior warnings from wildlife officials — including major utilities Duke Energy, PacifiCorp and NextEra Energy. Each company agreed to take steps to limit eagle deaths.

Yet at Duke Energy’s windfarms in Wyoming, eagle deaths became more frequent after the company reached a 2013 deal that included a \$1 million fine and shielded it from prosecution for 10 years, according to government and court records. The company had to pay \$29,623 for each subsequent eagle death. It says the collision rate has fallen since the installation of a camera system that spots eagles and triggers shutdown of nearby turbines.

The company also was awarded a permit allowing the accidental killing of eagles without penalty, providing it takes steps to minimize them. Wildlife officials approved such permits for more than two dozen major wind projects over the past several years, sometimes with opposition from Native American tribes that revere eagles.

Despite objections from the Colorado River Indian Tribes, officials approved a permit last year for Tucson Electric Power, operator of 62 turbines in southern New Mexico, allowing it to kill 193 golden eagles over 30 years. Federal officials said a permit offered the “only available avenue” to require conservation measures such as minimizing or compensating for eagle deaths.

In Minnesota, Grand Portage Band of Lake Superior Chippewa Chairman Robert Deschampe said with their proposal to further streamline permitting, wildlife officials had “abandoned” protections for eagle nests and ignored tribal concerns.

Several major conservation groups jointly lobbied the White House with Duke energy and other utilities in support of streamlined permitting. Their rationale was that regulating industry through permits was preferable to companies ignoring eagle deaths out of fear of prosecution.

“Part of the issue is that companies have generally not been requesting permits and they’ve been taking their chances and there hasn’t been a lot of law enforcement,” said Steve Holmer, vice president of policy at the American Bird Conservancy.

Violations of the Eagle Protection Act rose during the second term of President Barack Obama, after wind farms proliferated and an AP investigation found dozens of unprosecuted eagle deaths.

At the urging of industry, Trump appointees rolled back enforcement of the Migratory Bird Treaty Act that protects more than a thousand

species in addition to eagles.

A Biden order reversed the rollback. However, cases continued sliding and hit their lowest level in a decade in the Democrat’s first year with 49 recorded violations, after peaking at 232 under Obama in 2014. They averaged 67 annually under Trump.

In its 2024 budget request, the service revealed special agents were at historical low levels and that 47 agents will hit mandatory retirement in the next four years.

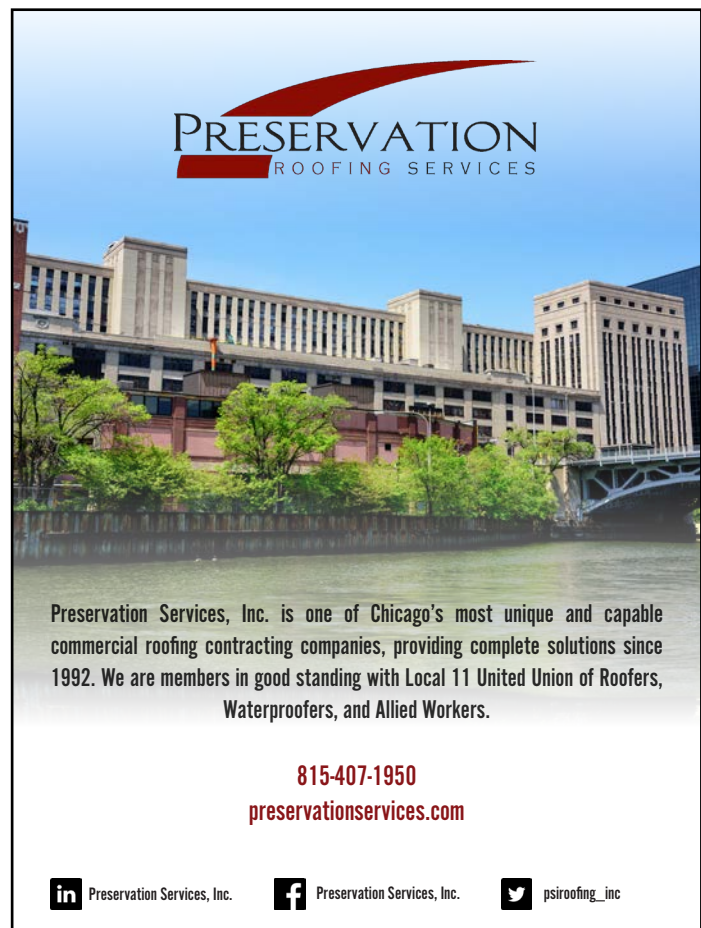
Only about one in eight cases brought under the Eagle Protection Act from 2012 to early 2022 resulted in fines, probation or jail time, according to AP’s analysis.

Whether criminal charges are pursued is up to prosecutors, said agency spokesperson Christina Meister.

At Duke’s Top of the World wind farm near the town of Rolling Hills, at least 56 eagles have been killed since it started in 2010.

Several years ago, Duke deployed a camera system to detect incoming eagles so turbines in a bird’s path can be shut down. Since the cameras were installed, eagle deaths declined by more than 60 percent, said company scientist Misti Sporer.




“Today, we would likely not put those wind turbines where they are,” Sporer said. ■■



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# NEWS

## EPA Rule Would Force Clean-Up of Toxic Coal Ash Dumped in Landfills, Ponds Near Power Plants

By Matthew Daly | Associated Press

WASHINGTON (AP) — The Environmental Protection Agency is strengthening a rule aimed at controlling and cleaning up toxic waste from coal-fired power plants. A proposal announced Wednesday, May 17, would for the first time require safe management of so-called coal ash dumped in hundreds of older landfills, "legacy" ponds and other inactive sites that currently are unregulated at the federal level.

EPA Administrator Michael Regan said the plan would hold polluters accountable for controlling and cleaning up coal ash, a byproduct of

burning coal in that can pollute waterways, groundwater, drinking water and the air. Coal ash contains contaminants such as mercury, chromium and arsenic associated with cancer and other health problems.

"Ensuring the health and safety of all people is EPA's top priority, and this proposed rule represents a crucial step toward safeguarding the air, groundwater, streams and drinking water that communities depend on," Regan said in a statement.



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*The Richmond city skyline can be seen on the horizon behind the coal ash ponds along the James River near Dominion Energy's Chesterfield Power Station in Chester, Va., Tuesday, May 1, 2018. The Environmental Protection Agency is moving to strengthen a rule aimed at controlling and cleaning up toxic waste from coal-fired power plants. A proposed rule announced Wednesday, May 17, 2023, would require safe management of so-called coal ash dumped in areas that currently are unregulated at the federal level. (AP Photo/Steve Helber, File)*

If finalized, the rule would help protect underserved and minority communities already overburdened by pollution, reflecting the Biden administration's commitment to environmental justice, Regan said.

"Many of these communities have been disproportionately impacted by pollution for far too long," he said, noting that power plants, chemical plants and other large industrial sites are commonly located in poor and minority neighborhoods.

The proposed rule follows an EPA proposal last week to impose new limits on greenhouse gas emissions from coal- and gas-fired power plants — the Biden administration's most ambitious effort to roll back planet-warming pollution from the power sector, the nation's second-largest contributor to climate change.

The agency also has proposed rules to crack down on polluted wastewater from coal-burning power plants and limit emissions of mercury and other harmful pollutants from coal-fired power plants, updating standards imposed more than a decade ago.

The coal ash rule follows a legal settlement between the agency and public interest groups, including the National Association for Advancement of Colored People, Sierra Club and Clean Water Action.

The groups said in a lawsuit that a 2015 EPA rule on coal ash failed to regulate a large portion of coal ash pollution in the United States.

Earthjustice, an environmental group that represented the coalition that sued EPA, called the new proposal a major win for communities near coal-fired power plants. The revised rule extends federal coal ash regulations to most coal ash disposed at power plants and extends federal monitoring, closure and cleanup requirements to hundreds of older landfills, ponds and dump sites that previously were excluded, the group said.

"This is a really big deal," said Lisa Evans, senior counsel for Earthjustice. "The Biden administration is standing up for people near hazardous coal waste sites around the country. For far too long, a

large portion of toxic coal ash around the U.S. was left leaching into drinking water supplies without any requirement that it be cleaned up."

The EPA proposal tightens a loophole that allowed many power-plant owners to avoid "cleaning up the toxic mess they created," Evans said. "Power plants will finally lose their hall pass to leave coal ash wherever they dumped it."

Based on analysis of industry data provided to the EPA, Earthjustice identified 566 landfills and ponds at 242 coal plants in 40 states that were excluded from the 2015 federal regulations, Evans said.

EPA estimates it would cost utilities more than \$300 million a year to comply with the new rule, which is expected to become final next year.

The power industry has complained about an "onslaught" of EPA rules aimed at the power sector. The agency's actions are "designed specifically to cause the premature closure of coal power plants," said Michelle Bloodworth, president and CEO of America's Power, a lobbying group for industries involved in producing electricity from coal.

She urged EPA to modify its proposals "to avoid premature coal retirements, rather than speed up retirements and jeopardize grid reliability."

Coal ash storage and disposal goes back decades, but went largely unregulated until a 2008 spill at a Tennessee Valley Authority power plant in Kingston, Tennessee. A containment dike burst and flooding covered more than 300 acres, dumped waste into two nearby rivers, destroyed homes and brought national attention to the issue.

In 2014, an estimated 39,000 tons of coal ash spewed into the Dan River after a drainage pipe running below a waste dump collapsed at a Duke Energy plant in Eden, North Carolina. The toxic sludge turned the river gray for more than 70 miles. ☹️

# NEWS

## NYC Skyscrapers Turning to Carbon Capture to Lessen Climate Change

By Cathy Bussewitz | AP Energy Writer

NEW YORK (AP) — From the outside, the Manhattan high-rise looks like any other luxury building: A doorman greets visitors in a lobby adorned with tapestry and marble.

Yet the basement has a set of equipment seen almost nowhere else in the world. To reduce emissions, the owners have installed twisting pipes and tanks that collect carbon dioxide from the building's massive, gas-fired boilers.

The goal is to stop carbon dioxide, a climate-warming gas, from entering the atmosphere. In such a vertical city, it's impossible to address climate change without tackling emissions from buildings. So building owners must make dramatic cuts starting next year or face escalating fines under a new law which affects some 50,000 structures — more than half the buildings in the city. Other cities such as Boston and Denver passed similar laws.

To comply, some property managers are installing carbon capture systems, which strip out carbon dioxide, direct it into tanks and prepare it for sale to make carbonated beverages or soap. In this case, the carbon dioxide is sold to a concrete manufacturer in Brooklyn.

"Time is not on our side, and this type of solution can be installed quickly, cost-effectively and without a major disruption," said Brian Asparro, chief operating officer of CarbonQuest, which built the system.

Critics say buildings should be switched to electricity instead.

"Carbon capture doesn't actually reduce emissions; it seeks to put them somewhere else," said Anthony Rogers-Wright, director of environmental justice at New York Lawyers for the Public Interest.

It's unclear whether carbon capture will be recognized by New York City as a qualifying emissions reduction; the city has not decided.

### Capturing the Culprit

In the Manhattan building's basement, two 500-horsepower boilers rumble, burning natural gas and releasing carbon dioxide. The boilers produce roughly half the building's emissions. The other half are generated at power plants where the building buys electricity. The carbon capture system, Asparro said, is trapping about 60 percent of the boilers' emissions.

"Boilers like this are installed everywhere, in schools and hospitals around the world," Asparro said.

Carbon dioxide and other gases flow from the boilers over a special material that separates out the carbon dioxide in a system that occu-

pies two former parking spaces. Then it's compressed and cooled to minus-10 degrees Fahrenheit, turning it to liquid.

Pipes lead to spigots outside the building, where a truck loads up with the liquefied CO2 and takes it to a concrete manufacturer in Brooklyn.

The apartment building is trying to reduce energy in other ways, too, said Josh London, senior vice president at Glenwood Management Corp. It has computerized motors, fans and pumps, LED lighting and battery storage. The company plans to install carbon capture systems in five more buildings this year.

Nearly 70 percent of New York City's large buildings have steam boilers like these that run on natural gas or oil, according to NYC Accelerator.

The city law requires all buildings over 25,000 square feet to reduce emissions. In Minnesota, Radisson Blu Mall of America, a hotel, has installed a system that captures carbon dioxide that's eventually used to make soap.

### Mineralizing Into Concrete

Over in Brooklyn, the floor shakes as yellow machines churn at Glenwood Mason Supply Company Inc., a concrete maker unrelated to Glenwood Management Corp. Grey concrete blocks rattle down a conveyor under a din of metal gears and motors.

A truck arrives with liquefied carbon dioxide and then, using equipment provided by a company called CarbonCure, it's compressed and turned into a solid.

As concrete ingredients churn, the carbon dioxide, now essentially dry ice, flows in like a mist. It reacts with calcium ions in cement, a main ingredients of concrete. This forms calcium carbonate, which becomes embedded in the concrete.

Once carbon dioxide is in that mineral state, it's secure and it won't be released unless heated to about 900 degrees Celsius (1,652 degrees Fahrenheit), said Claire Nelson, a geochemist who specializes in carbon capture at Columbia Climate School.

"So unless a volcano erupts on top of your concrete building, that carbon is going to be there forever," Nelson said.

Adding mineralized carbon dioxide to concrete can reduce its carbon footprint, though not by much. On average, concrete producers using CarbonCure technology reduce their carbon footprint by 5 percent to 6 percent, said Robert Niven, CEO of CarbonCure. But that





*A liquid carbon dioxide containment unit stands outside the fabrication building of Glenwood Mason Supply Company, Tuesday, April 18, 2023, in the Brooklyn borough of New York. New York is forcing buildings to clean up, and several are experimenting with capturing carbon dioxide, cooling it into a liquid and mixing it into concrete where it turns into a mineral. (AP Photo/John Minchillo)*

is still meaningful, because making concrete contributes significantly to climate change.

#### Questions Remain

Many environmental groups remain skeptical of carbon capture, favoring investments in renewable energy. They also fear it could be unsafe to store carbon dioxide in a residential dwelling.

After a carbon dioxide pipeline ruptured in Satartia, Mississippi, in

2020, 45 people sought medical attention at local hospitals, according to a report from the Pipeline and Hazardous Materials Safety Administration. People exposed to high concentrations of carbon dioxide, the report said, may experience rapid breathing, confusion, elevated blood pressure and increased arrhythmias. Extreme concentrations can lead to death by asphyxiation.

There's also a risk of leaks, if a truck transporting carbon dioxide gets into an accident, Rogers-Wright said.

Proponents of carbon capture say there are safeguards and the technology installed in Manhattan was permitted by multiple city agencies.

Nelson, the Columbia geochemist, who also started a carbon capture company, says storing natural gas in basements is more dangerous than storing carbon dioxide, and many people accept the risks posed by natural gas.

The biggest challenge, proponents say, is scaling this and other solutions fast enough to make a difference in climate change.

Back in Manhattan, the local utility doesn't have enough renewable energy to sell to all New York customers, and "with solar, you need a bigger footprint than what we have in a building like this," London said. He wants to buy wind power when it's more widely available, but "we can reduce our emissions while we wait," he said. ☐☐

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# NEWS

## Watts' Offers Online Training Legionella Mitigation and Building Safety

The illnesses, shutdowns and disruptions caused by Legionella in building plumbing systems are a constant risk to building inhabitants. To learn more about these threats, participants can enroll in Watts' comprehensive 8-module course, "Mitigating the Risk of Legionella," available exclusively on Watts Works Online or by visiting [training.watts.com](http://training.watts.com).

This highly informative 2.5-hour course is specifically designed for facility managers, engineers and infection control professionals. Upon completion of the course, participants are accredited with 0.25 Continuing Education Units (CEUs) through the American Society of Plumbing Engineers (ASPE).

As an added incentive, those who complete the course through June 26 will receive a free 12-oz. campsite mug.

Watts also has announced "Improving Building Safety & Occupant Comfort: Efficient Floor Warming & Snow Melting Solutions," an AIA-accredited webinar worth 1 LU|HSW CEU.

On Tuesday, June 20, at 11:00am CT, participants will learn about

how radiant floor warming and snow melting solutions can improve occupant health, safety, and comfortability.

These comfort solutions not only take building designs to the next level, but also create a more energy efficient and luxurious space.

In this webinar, our industry subject matter experts will discuss and share their expertise on:

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For assistance in building an effective water management strategy, visit [www.watts.com/solutions/legionella/legionella-resources](http://www.watts.com/solutions/legionella/legionella-resources).

To register for the building safety webinar, visit [watts.com/BuildingSafetyCEU](http://watts.com/BuildingSafetyCEU).

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# Western Specialty Contractors Recommends Spring to Clean Building Exteriors, Survey for Damage

ST. LOUIS — From the tallest of skyscrapers to the corner office and the downtown warehouse district, the stressors of sunlight, changing weather, water, building movement and settlement can break down and deteriorate building facades creating comfort, safety and maintenance issues that can quickly add to the cost of property ownership.

“Now that winter is over, spring marks an ideal time for building owners and facility managers to survey their buildings and structures for any damage that may have resulted from the cold, winter weather, make repairs and perform preventative maintenance to protect the exterior going forward,” said Western Specialty Contractors facade expert Jason Holtman.

A masonry and facade restoration specialist such as Western Specialty Contractors is recommended to identify problem issues such as cracking, efflorescence, spalling, control joint failure, and sealer or caulk failure and to recommend a repair and prevention plan that protects the property and tenant spaces from leaks and water damage. Proper facade maintenance will aid in reducing the likelihood of unexpected costs and repairs, plus help to maintain the property’s value, said Holtman.

Structure facades can be made from any number of materials including brick, terra cotta, granite, marble, sandstone, limestone, brownstone, concrete masonry units, glass curtain wall systems, Exterior Insulation Finishing Systems (EIFS) and precast concrete. Likewise, they can all deteriorate for any number of reasons, including:

- Lack of maintenance/funding
- Movement
- Freeze/thaw
- Air pollution
- Improper workmanship/design
- Moisture

Ongoing maintenance is always recommended to minimize exterior damage, no matter what the building material. Holtman recommends regular, proper cleaning of the building’s facade in the spring.

“A clean facade projects professionalism, can increase sales for businesses located within the building, increase the life of the property, improve the building’s value and make surveying winter damage easier to see,” said Holtman.

Facade cleaning can be performed using a variety of methods including:

- High-pressure water
- Low-pressure water

- Sandblasting
- Wet aggregate blast
- Hot water steam
- Chemicals
- Soda blast
- Poultice
- Glass bead
- Sponge blast

For assistance with facade maintenance, contact the Western Specialty Contractors branch location nearest you — <http://www.westernspecialtycontractors.com/western-locations/>.



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# NEWS

## Judge Not Inclined to Shut Down Pipeline, Pleads With Wisconsin Tribe to Work With Oil Company

By Harm Venhuizen | Associated Press/Report for America

MADISON, Wis. (AP) — A federal judge said Thursday, May 18, that he is unlikely to force an energy company to shut down an oil pipeline in northern Wisconsin, despite arguments from a Native American tribe that the line is at immediate risk of being exposed by erosion and rupturing on reservation land.

U.S. District Judge William Conley said the Bad River Band of Lake Superior Chippewa didn't prove that an emergency exists along a stretch of the Enbridge Line 5 pipeline where large sections of nearby riverbank have been washed away in recent weeks. Conley also expressed frustration with the tribe for not allowing Enbridge to reinforce the land around the pipeline.

"The band has not helped itself by refusing to take any steps to prevent a catastrophic failure at the meander," Conley said. "You haven't even allowed simple steps that would have prevented some of this erosion."

The tribe says less than 15 feet of land now stands between the Bad River and Line 5 along a meander on the reservation. In some places, more than 20 feet of riverbank has eroded in the past month alone. Experts and environmental advocates have warned in court that an exposed section of pipeline would be weakened and could rupture at any time, causing massive oil spills.

Enbridge has repeatedly asked the tribe for permission to place sandbags along the riverbank to prevent erosion. It also recently requested a permit to install barricades made of trees to protect the pipeline.



An above ground section of Enbridge's Line 5 at the Mackinaw City, Mich., pump station sits on Oct. 7, 2016. Attorneys for a Wisconsin Native American tribe argued Thursday, May 18, 2023, that a federal judge should order an energy company to shut down an oil pipeline the tribe says is at immediate risk of being exposed by erosion and rupturing on reservation land. U.S. District Judge William Conley indicated his reluctance to do so. (AP Photo/John Flesher, File)

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Tribal officials have not approved any of the company's requests.

Conley said the tribe's inaction undermined its repeated claims that the pipeline must be shut down.

"It looks like a strategy, even if it's just idiocy," he said. "I'm begging the band to just act. Do something to show you're acting in good faith."

Conley planned to issue a ruling in the next two weeks explaining what conditions would have to be met for him to order a shutdown.

"There's going to come a time when there will be an imminent risk that will require me to step in," he said.

The Bad River tribe sued Enbridge in 2019 to force the company to remove the roughly 12-mile section of Line 5 that crosses tribal lands, saying the 70-year-old pipeline is dangerous and that land agreements allowing Enbridge to operate on the reservation expired in 2013.

Conley sided with the tribe in September, saying Enbridge was trespassing on the reservation and must compensate the tribe for illegally using its land. But he would not order Enbridge to remove the pipeline due to concerns about what a shutdown might do to the Great Lakes region's economy.

Instead, Conley told Enbridge and tribal leaders in November to create an emergency shutoff plan. His ruling said there was a significant risk the pipeline could burst and cause "catastrophic" damage to the reservation and its water supply.

Line 5 transports up to 23 million gallons of oil and liquid natural gas each day and stretches 645 miles from the city of Superior through northern Wisconsin and Michigan to Sarnia, Ontario. If the pipeline were shut down, gas prices would likely increase, refineries would close, workers would be laid off and the upper Midwest could see years of propane shortages, according to reports Enbridge submitted in court.

Enbridge has proposed a 41-mile reroute of the pipeline to end its dispute with the tribe and said in court filings that the project would take less than six years to complete. But the tribe has not granted the permits Enbridge needs to begin construction. A draft analysis of the project's environmental impact submitted in December 2021 received thousands of public comments, with many criticizing the report as insufficient. The company is still responding to the tribe's requests for more information.

Line 5 has also faced resistance in Michigan, where

Enbridge wants to drill a new tunnel under a strait connecting two of the Great Lakes. Michigan Gov. Gretchen Whitmer and Attorney General Dana Nessel have sought to shut down the pipeline. Nessel filed a brief in support of the tribe's request, saying a rupture in Wisconsin would also cause environmental damage in Michigan. ☐☐☐

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# NEWS

## Proper Coil Cleaning Reduces Energy Costs and Improves Overall Operations

STAMFORD, Conn. — With warmer weather on its way, now is the ideal time for facilities to add coil cleaning to the spring-cleaning checklist. Conducting maintenance helps to ensure that HVAC systems are operating efficiently, and clean coils are a large contributor to keeping equipment running smoothly.

“Effectively cleaning your coils can have a big impact on reducing energy costs and help extend the life of the HVAC equipment, which are both beneficial for the bottom line,” said Tim Kane, President and CEO of Goodway Technologies. “Any buildup on coils results in your system needing to work harder than it needs to meet the expected outcome and that increases energy usage.”

When an HVAC system is operating with dirty coils, it can consume up to 37 percent more power and not perform as effectively as a system running with clean coils. Dirty coils also increase operating pressure and temperatures that break down the compressor’s lubricant and result in equipment failure. A failed compressor means no cooling and costly repair.

If that’s not enough to put coil cleaning higher on your spring checklist, consider the impact dirty evaporator coils have on indoor air quality. Coils can become a breeding ground for mold and bacteria as airborne contaminants are filtered through the system, negatively impacting indoor air quality.

What are best practices for cleaning condenser and evaporator coils?

Goodway Technologies is sharing a helpful coil cleaning checklist for facility maintenance professionals to follow to effectively clean coils:

- Clear the area for access – Cleaning coils works best when the maintenance technician can get the cleaning wand close to the areas that need to be cleaned. Consider using flexible wands if access is hard.
- Vacuum coils and fins – Before cleaning, remove dry debris from the coils with a vacuum that can reach dust and dirt in tight spaces. Other options include using compressed air.
- Clear blockages – The condensate pan and line need to be free of blockages before wet cleaning can begin, as any obstructions can cause major damage due to flooding water from cleaning and HVAC system condensate. Consider a wet dry vac to suck out any debris prior to cleaning.
- Use a wet cleaning process – Using pressurized water forces deeply embedded dirt and debris to come loose, vastly improving the cleaning process.
- Use a powerful, yet delicate cleaning system – High pressure equipment can damage fins, especially on evaporator coils. The ideal system should deliver no more than 400 PSI, and plenty of water flow.

- Apply an alkaline non-caustic cleaning foam – Using a non-caustic cleaner will help protect coils from corrosion. Products like Goodway’s non-caustic, nontoxic CoilShine expand after being sprayed onto the coils to clean in even tight spaces.
- Apply a mold control agent – Adding an EPA registered mold inhibitor can help keep coils clean and free of odor and allergy causing mold and mildew. Make sure it’s EPA registered and approved for use in occupied spaces.

Goodway carries a variety of coil cleaning equipment that are all simple to use and can be operated by one person, such as the CoilPro® CC-400HF HiFlo®. The coil cleaning kit combines 400 PSI of cleaning power with a 3.0 GPM flow rate to clean even the thickest, dirtiest coils.

Visit [tinyurl.com/yz5m3jvp](https://tinyurl.com/yz5m3jvp) to view the Coil Cleaner Buying Guide for more tips and tricks and to check out the wide array of cleaning and maintenance solutions available for your needs. ☒



Use pressurized water to eliminate embedded dirt and debris.



# An Air Cleaning Alternative for the 21st Century

By Greg Rankin

While effective indoor air filtration technologies have long been a necessity in healthcare, school, transportation and other settings, COVID-19 brought the need for clean and safe air to the forefront. However, the pandemic also revealed the limitations of traditional options, such as HEPA filters and ultraviolet light disinfection devices, to effectively remove pathogens from the air. These inadequacies led researchers at North Carolina State University (NC State) to develop a filtration technology that presents a viable alternative for air cleaning in the 21st century.

NC State's novel development combines the best performance characteristics of High Efficiency Particulate Air (HEPA) filters and ultraviolet light (UVC) devices into a single technology. The result is a 2D, lightweight, non-thermal plasma-enhanced textile called FIL-TEX that is proficient at both capturing and killing bacteria, viruses and other contaminants with a 99.9-percent efficiency.

## The Drawbacks of Traditional Air Cleaning Solutions

While high-MERV (Minimum Efficiency Reporting Values)-rated HEPA filters have long been the gold standard for air filtration, they are an imperfect solution for today's needs. Although HEPA filters offer a 99.9-percent efficiency rating when it comes to collecting small particles and pathogens, they do not deactivate live bacteria and viruses, which makes replacing these filters a potentially hazardous task.

"Because HEPA filters merely capture particulates and pathogens and focus them in one place, there is a strong likelihood that any collected bacteria or viruses will be re-aerosolized when replacing the filter," explains Dr. Warren Jasper, a professor in the Textile Engineering Chemistry and Science Department at the Wilson College of Textiles at NC State.

In addition, HEPA filters are frequently located in the air handling

system, which is often located far from the rooms or settings from which collection is necessary, meaning they are a whole-building solution versus an intermediate one.

"Essentially, they are often placed too far away to provide protection to areas where people are congregating," says Jasper. "If someone coughs in a crowded classroom, the fact that there is clean air near the air handler doesn't really protect the individuals from the airborne particulates that have just been released into the room."

UVC disinfection technologies are growing in popularity because they successfully deactivate live pathogens and microorganisms by destroying their DNA; however, these systems utilize UV light mechanisms, which can cause adverse health effects, such as headaches and skin cancer, in individuals who are over-exposed, making UVC a poor choice in healthcare, educational and other highly populated settings.

In addition, when UVC technologies are combined with Heating Ventilation and Air Conditioning (HVAC) systems, as is often the case, operational and maintenance expenses may increase due to higher power requirements and costly bulb replacements.

## An Air Cleaning Technology for the 21st Century

Understanding the drawbacks of these traditional technologies, which date back to the 1930s and 1940s, researchers at NC State have developed an effective and contemporary method of providing clean and safe air that is suitable for today's post-pandemic needs.

"Filtration of airborne particulates can be divided into two camps — factive and passive," explains Dr. Jasper. "We decided to take the best performance characteristics from passive technologies that capture particulates and active technologies that purify the air and combine

*(Continued on pg. 32)*

# BEAR

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*HEPA filters efficiently collect small particles and pathogens, but they do not deactivate live bacteria and viruses, making replacement potentially hazardous.*



# NEWS

(Continued from pg. 31)

them into a single, more modern air cleaning solution.”

He explains that FIL-TEX comprises woven, knit or non-woven structures where non-conductive yarns are combined with conductive yarns that serve as electrodes. When a voltage is applied to these conducting yarns, a non-thermal plasma (NTP) is produced.

NTP, often called cold plasma, is an electrically energized form of matter that remains cool to the touch but is composed of a partially ionized gas that reacts with pathogens, chemicals, odorants and other contaminants, and converts them into harmless oxidized forms. So, when airborne pathogens pass through the FIL-TEX filter, the NTP reacts with the sheath membrane of the microorganisms, deactivating the virus or destroying the cell wall of the bacterium, essentially killing any airborne pathogens while also safely collecting them.

In addition, because it operates like a magnet that attracts, deactivates and removes unwanted contaminants from the air, FIL-TEX technology does not emit any additives or substances into the air.

## Proven Air-Cleaning Results

Following the COVID-19 pandemic, technology that effectively eliminates aerosolized pathogens is extremely important in confined spaces where people congregate.

“While good air circulation helps reduce the likelihood of the

transmission of airborne viruses and bacteria, effective filtration is crucial in locations where there is not much air turnover and in which we pack a lot of people,” says Dr. Frank Scholle, Associate Professor of Biological Sciences at NC State. “Close quarters without proper ventilation — such as gateways between the airport and airplane, buses or subways, classrooms, and exam or waiting rooms in health-care settings — provide an ideal environment for very contagious respiratory pathogens, such as COVID-19, chicken pox and measles, to transmit between people.”

Based on these needs, NC State researchers in Dr. Scholle’s virology lab tested the effectiveness of FIL-TEX, which was originally developed to remove smoke and particulates, against respiratory pathogens and were more than satisfied with the results.

An aerosolized coronavirus, similar in genetic makeup to the virus responsible for COVID-19 infections, was introduced into an enclosed laboratory-scale tunnel with FIL-TEX situated between the inlet and outlet. A sampling of the air before and after passing through FIL-TEX demonstrated encouraging post-filtration effectiveness of the novel technology.

“We had nearly a 3-log reduction in infectious virus after the FIL-TEX filter, to be specific up to a 99.7-percent effectiveness,” says Scholle. “The destruction of infectious virus was a truly significant level of success and was beyond our initial expectations.”

Following NC State tests, FIL-TEX was sent to CREM Co Labs — an independent R&D laboratory specializing in antimicrobial testing



FIL-TEX is 2D textile that produces a non-thermal plasma when charged with a voltage. It catches and kills pathogens with up to 99.9-percent efficiency.



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— which conducted similar analyses and found equally impressive results.

According to the report, FIL-TEX was proven to remove more than 99.9 percent of airborne viruses, such as COVID-19, and 99.9 percent of airborne bacteria, such as staph, while deactivating 98 percent of viruses found on the filter's surface.

FIL-TEX has also been shown to rapidly absorb continuous smoke and particulates such as oil, carbon, soot, ash and tar in enclosed spaces where venting is not an option, making it an effective air cleaning technology with many potential applications.

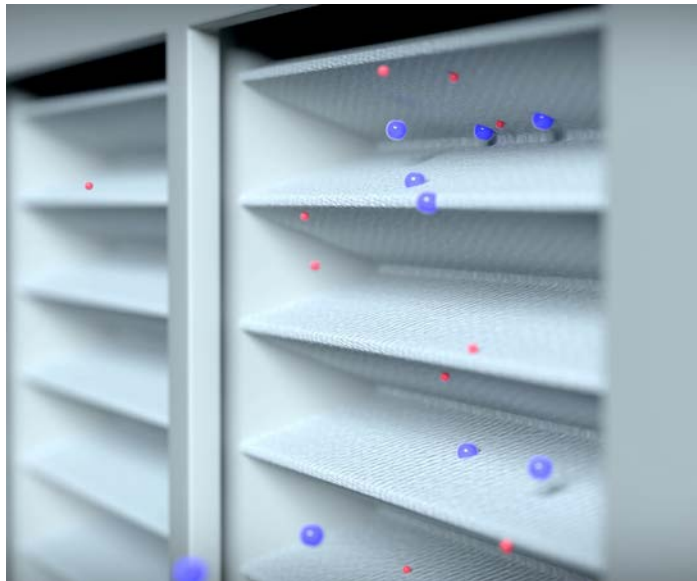
#### Applying the FIL-TEX Technology

FIL-TEX combines NTP technology with a 2D textile filter that can be

made from cotton, polyester, polypropylene, Kevlar or other fabrics, so it is lightweight and flat with a thickness of only about 2 mm. The textile filter is designed in such a way that air can pass through the system at a high rate and requires very little power making it an effective and energy efficient component suitable for a number of air cleaning devices and systems. These could include a wall- or ceiling-mounted device, or in conjunction with HVAC systems.

FIL-TEX is currently available through Stitch Partners which has licensed the intellectual property from NC State. It is available to air cleaner manufacturers which can incorporate the filter as a component in the development of new or current systems. ☞

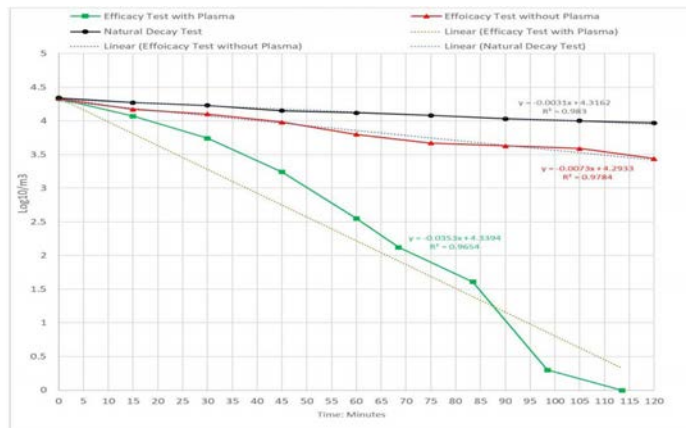
*Greg Rankin is a Houston-based freelance writer with more than 20 years of experience writing about the HVAC industry, mechanical engineering and clean technology.*



HEPA filters capture particulates and pathogens and focus them in one place where they can be re-aerosolized when replacing the filter.




UVC disinfection technologies are growing in popularity, but these systems can cause adverse health effects.



The destruction of infectious virus was beyond initial expectations. Test results show a 3-log reduction in infectious virus after the FIL-TEX filter was utilized.

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# NEWS

## Marsh Bellofram Earns Workplace Safety Recognition

NEWELL, W.Va. — U.S.-based manufacturer Marsh Bellofram is being recognized for its commitment to safety in the workplace. The Association for Rubber Products Manufacturers (ARPM) honored Marsh Bellofram in its Best Safety Practice category at its 2023 Safety Awards May 25 during ceremonies that were part of ARPM's Environmental, Health and Safety Summit being held in Columbus, Ohio.

The ARPM safety awards recognize companies in the manufacturing industry that have achieved excellent safety techniques that go beyond adherence to regulations. They are based on OSHA 300's log of work-related injuries and illness statistics and safety best practices.

Marsh Bellofram is a leading global manufacturer with 13 divisions focused on high-performance OEM, industrial, and process control instrumentation as well as elastomers, including diaphragms and specialty silicones.

Marsh Bellofram's environmental, health, and safety manager, Jonathon Monfredi, said the culture of health, wellness and protection starts with Marsh Bellofram's safety committee. The committee begins with a broad, overarching view of operations, seeks to engineer away hazards, and then drills down to daily practices that, when given adjustment or focus, can improve safety.

"Each safety committee member is given a monthly assignment to conduct individual audits in their work area and help with monthly safety initiatives," said Monfredi. "By conducting focus inspections in each department, we're able to identify potential safety issues that we otherwise may not have. It has helped improve our overall safety culture."

With the U.S. Bureau of Labor Statistics reporting that fatal workplace injuries rose nearly 9 percent between 2020 and 2021, the last year for which there are issued reports, workplace safety remains a concern for all businesses, particularly in manufacturing, where humans and machines often work in close contact. Recognition like this from ARPM is a reward for past accomplishments, but also serves as a reminder to be ever vigilant.

Marsh Bellofram will be recognized on May 25 during ceremonies that are part of ARPM's Environmental, Health and Safety Summit being held in Columbus, Ohio. For more information about the 2023 Safety Awards, visit [www.arpminc.com/ehs](http://www.arpminc.com/ehs).



Marsh Bellofram Environmental, Health and Safety Manager Jonathon Monfredi.





# Inspect to Protect Buildings and Occupants

Fire sprinklers provide the greatest fire protection for buildings in your community. They control a fire while it's still small and allow occupants to safely escape.

However, just like other systems in a building, it's essential that a fire sprinkler system is inspected, tested, and maintained (ITM), especially since lives are dependent on it.

Your building's fire sprinkler system must be inspected, tested, and maintained to ensure it will operate properly during a fire. Illinois state code, NFPA 101: Life Safety Code (2015 edition) requires that all automatic fire sprinkler systems, standpipe systems and fire pumps must follow inspection, testing, and maintenance (ITM) procedures according to the NFPA 25 standard.

And in accordance with state law (225 ILCS 317/17), building owners must utilize an inspector who is employed by a state-licensed fire sprinkler contractor and has appropriate credentials through completion of a certified sprinkler fitter apprenticeship program approved by the U.S. Department of Labor and/or certification through NICET III, ASSE 15010, or NFPA Water-Based ITM (WBITM).

Don't let a devastating fire happen in your community. Ensure your local building owners and managers comply with state requirements by incorporating fire sprinkler system ITM programs in their buildings.

For more information on maintaining fire sprinkler systems, go to [firesprinklertesting.org](http://firesprinklertesting.org) series of videos, codes, guides and resources to assist you.

For more information, call (708) 403-4448.



Verify that each fire sprinkler system in your community is inspected, tested, and maintained to ensure it will operate properly during a fire.

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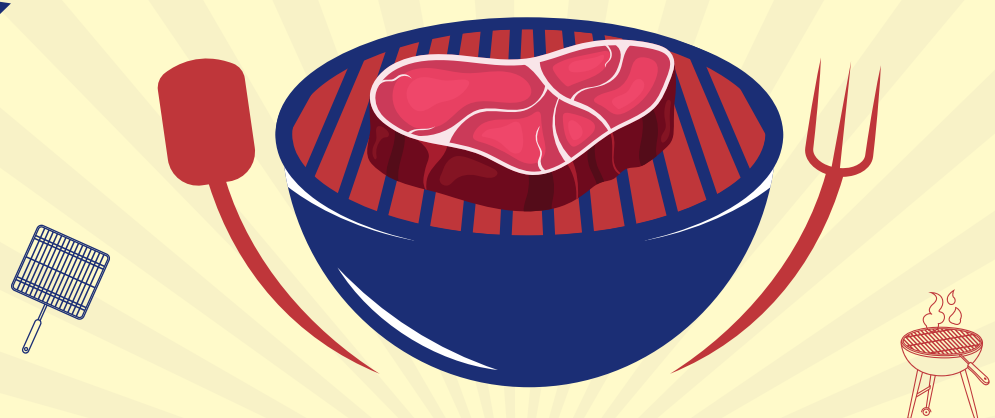
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CEAC PRESENTS

# BBQ



With the weather finally warming up, we were able to celebrate another great May Barbecue Picnic this year. We would like to thank everyone who came out to celebrate and make it the great time it always has been at this time of year. We're grateful to Local 399 for once again providing the space on their back lot as the site for our picnic, and to the caterers for their expertise in providing such a delectable spread for our barbecue. Most of all, we are ever thankful to our kind and generous sponsors, without whom neither this event nor any of our others would be possible. Aero Building Solutions, Air Comfort, Con-tech, Hill Group, Neuco and Parkway Elevators have all shown their support for the CEAC — please show them your support in return. We also would like to congratulate all of our winners in this year's event raffle, and everyone who bought tickets and supported the Chief Engineers.

After this month's White Sox event at Guaranteed Rate Field, we break for the remainder of the summer until our September Golf Outing. This year, we'll be celebrating our 83rd year of this steadfast tradition out at Cog Hill. To register for the Golf Outing, please visit [www.chiefengineer.org](http://www.chiefengineer.org) and click on the "Events" tab.

If your organization would like to be a sponsor for the Golf Outing, or should you have any difficulties registering, please reach out to our Golf Outing committee chairs Kevin Kenzinger at (312) 296-5603, or Brendan Winters at (773) 457-6403.









# AIR COMFORT



*Air Comfort President Mike Devito has been with Air Comfort for more than 30 years.*

## AIR COMFORT BUILDS ON REPUTATION as LEADING CHICAGO MECHANICAL CONTRACTOR

**A**ir Comfort Corporation was founded in 1935 as an engineering company and equipment distributor. Today, the company has built a reputation as Chicago's mechanical contractor of choice for service, system design, construction, fabrication and installation.

Air Comfort's solutions can be found across a variety of industries, including commercial real estate, data centers, food processing, healthcare, industrial and manufacturing. They work closely with their customers to provide a perfect solution to commercial HVAC problems, with uninterrupted performance and round-the-clock reliability. It's what they've become known for in their 88-plus years in business.

A recent high-profile Air Comfort project was completed in about five months during the winter. Set in the heart of Chicago's Central Business District, PNC Centre at One N. Franklin

features 36 stories of Class-A office space totaling more than 617,000 square feet. Completed in 1991, the LEED Gold- and ENERGY Star-certified building required a complete chiller plant equipment overhaul.

"They were looking for solutions to save energy with new, modern equipment, and our engineering department, and pipefitting and service technicians were eager to take on the job," said President Mike Devito. "Working with the PNC Centre's building management team helped the project run smoothly, and we appreciate everyone's collective efforts."

The existing system at One N. Franklin consisted of two 1,000-ton centrifugal chillers, three chilled water pumps and three condenser water pumps. Additionally, the aging 30-plus-year-old system lacked a variable frequency drive (VFD) and proper controls necessary to power a high-efficiency system. Air Com-



*The system replacement at One N. Franklin included Grundfos vertical double-suction chilled water and condenser pumps with variable frequency drive.*

fort's solution included a full system replacement swap with two 920-ton York YMC2 magnetic bearing chillers and six Grundfos vertical double-suction chilled water and condenser water pumps with VFD. Fitting the existing footprint and electrical infrastructure was imperative, as was providing high-efficiency operation for the future of the building. Air Comfort also updated the building controls sequence, bypass valve and location DP sensor to improve part load condition operation and overall system efficiency.

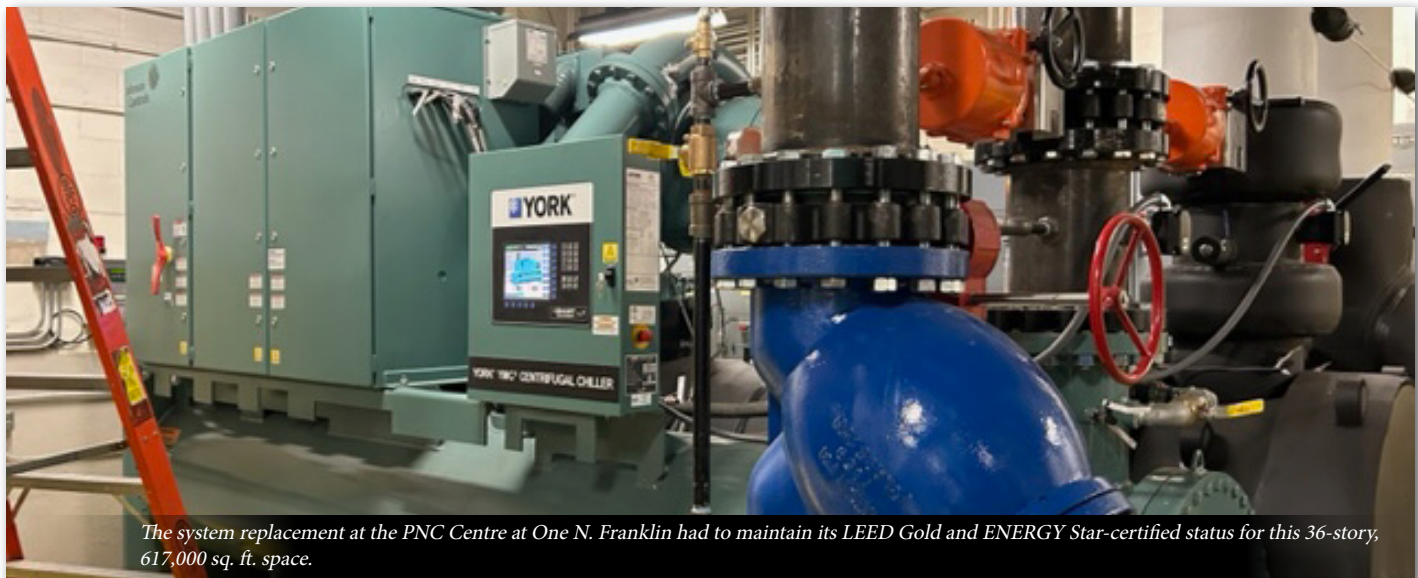
The equipment upgrade at One N. Franklin was completed as part of the ComEd Commercial HVAC Incentive Program. According to Devito, building managers will notice significant energy cost savings in the next 5-7 years — the average payback period for the York YMC2 chiller.

#### **A HISTORY OF EXCELLENCE UNDER NEW LEADERSHIP**

Dr. Willis Carrier — the inventor of modern air conditioning — and a group of young engineers created Air Comfort in 1935 when Carrier was searching for a company to sell, install and service his new air conditioning products in the Midwest. The technology of the time allowed the company to create “weather” and provide a comfortable environment to everyone in their homes or businesses.

Through the years, Air Comfort has evolved away from air conditioning exclusively and has become a full-service mechanical contractor. Today, the company is led by Devito, who assumed

*(Continued on pg. 40)*



*The system replacement at the PNC Centre at One N. Franklin had to maintain its LEED Gold and ENERGY Star-certified status for this 36-story, 617,000 sq. ft. space.*





*Newly installed chilled water pumps at One N. Franklin.*

*(Continued from pg. 39)*

the role of president in 2021 from three-generation owner Tim Smerz.

Devito's experience in the HVAC industry began in the United States Navy when he maintained his ship's refrigeration and mechanical systems. From there, he was hired in the parts department at Air Comfort, then strengthened his skills and craftsmanship through the Chicago Pipefitters Local 597 union apprenticeship. His more than 30-year tenure with the company gradually expanded his responsibilities as he worked his way from service technician to sales engineer to vice president and now, president.

"I'm honored and grateful to lead Air Comfort's future as one of the largest mechanical contractors in the Chicagoland area," Devito said. "My focus when I started was on continued growth and providing quality solutions for our clients, and I'm pleased to report we've experienced significant growth in the last two years."

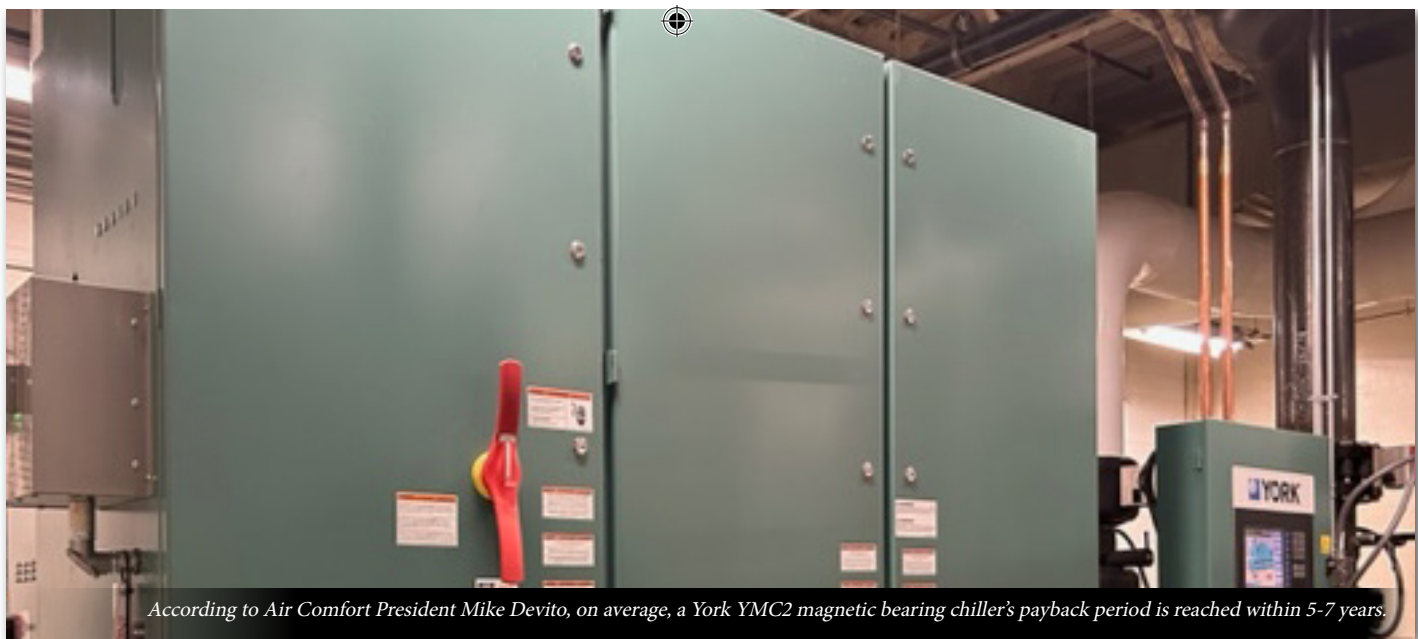
#### **AIR COMFORT EXPANDS CAPABILITIES TO PLUMBING SERVICE**

In May 2023, Air Comfort was pleased to announce the company's expansion into commercial and industrial plumbing service. In addition to 24/7 emergency service, the company's union plumbers are equipped to provide:

- Digital camera inspections and locating
- Plumbing fixture repair and replacement
- Backflow maintenance, installation, repair and certification
- Ejector pump maintenance, installation and service
- Drain line cleaning, repairs, replacement and jetting
- Hot water heater commercial maintenance, installation and service

"We strive to be the single source for all our clients' needs, so launching our plumbing division was a natural next step in our growth strategy," Devito said. "As with all our other services, we're committed to providing clients with the best customer service and highest-quality workmanship. We do that by making a significant investment in training for every Air Comfort field





*According to Air Comfort President Mike Devito, on average, a York YMC2 magnetic bearing chiller's payback period is reached within 5-7 years.*



*Two 920-ton York YMC2 magnetic bearing chillers provided part of Air Comfort's solution at One N. Franklin.*

and office employee, and by partnering with our local union to make sure our pipefitters and plumbers are the best-trained in the industry.”

As part of their investment in training, Air Comfort makes sure to stay on the cutting edge of the industry's latest technology so they're always giving their team the tools they need to be the best problem solvers. Currently, they're in the process of overhauling their field software, with plans to implement BuildOps software — an all-in-one solution designed specifically with HVAC contractors in mind — within the next several months.

“This is a new, state-of-the-art mobile platform that will allow us to enhance our dispatching capabilities, and the capabilities of our technicians in the field,” Devito said. “It will give us better

access to customer data, which will generate better client reports and ultimately improve the customer experience.”

In their 88+ years of business, Air Comfort has been recognized by the Mechanical Service Contractors of America (MSCA), and also maintains an excellent safety rating for their commitment to safety. Most recently, the company was recognized by the Chicago Tribune as a Chicago Top Workplace, the nation's most credible employer recognition program.

“Our employees drive our business, and it's because of them that Air Comfort continues to lead our industry as a first-class mechanical contractor,” Devito said. “When they're happy, it overflows into the quality of work our customers receive from us, and that's always the end goal.” ■■■

# NEWS

## Western Specialty Contractors Restores/ Waterproofs Nile Kinnick Stadium at University of Iowa

ST. LOUIS — Western Specialty Contractors – Des Moines, IA Branch used its expertise in concrete/masonry restoration and waterproofing to repair and protect portions of historic Nile Kinnick Stadium — home to the University of Iowa Hawkeyes football team.

Located in Iowa City, Iowa, Nile Kinnick Stadium was named after University of Iowa football star Nile Kinnick, who won the Heisman Trophy in 1939 and died in 1943 while serving in World War II. Originally named Iowa Stadium, the facility was constructed in only seven months between 1928 and 1929 using horses and mules as the primary heavy-equipment movers. The stadium has undergone major renovations in 1956, 1983, 1990, 2004 and 2016. Its current capacity is 69,250, making it one of the 20 largest university-owned stadiums in the country.

Most sports stadiums and arenas in the United States are made up of reinforced and precast concrete with steel seating supports and railings. Unfortunately, an even more universal characteristic is their openness and vulnerability to the elements — in addition to the wear and tear they receive from fans. All of these forces combine to take a toll on their structural integrity.

Without routine maintenance and protection, these concrete structures are subject to cracking, spalling and structural damage from movement and reoccurring freeze and thaw cycles.

Engineering firm Shive-Hattery Architecture + Engineering worked with university officials to determine the scope of work required by Western to restore and protect Kinnick Stadium, which included:

- Waterproofing Membrane – Grandstands (115,000 sq. ft.)
  - Joint sealant replacement
  - Vertical spall repairs
  - Concrete crack repairs
  - Concrete step replacement
- Concourse Soffit and Suspension System Repair/Replacement
  - East Concourse repair plaster and repaint
  - West Concourse replace entire suspension system and plaster
- Masonry Repairs – Southwest Corner of Stadium
  - New through-wall flashing
  - 100% tuckpointing
  - Parapet rebuild
  - Multi-wythe brick replacement

Challenges on the project resolved by Western included scheduling and mobilizing work around unanticipated events at the stadium and having to build custom aluminum soffits that required multiple shop drawing revisions to ensure a proper fit.

Western's craftsmen started the \$1.2 million restoration project in May 2022 and were able to complete the work on schedule in August 2022 and within budget.

To learn more about Western's stadium restoration services, visit [westernspecialtycontractors.com/stadium-restoration-2/](https://westernspecialtycontractors.com/stadium-restoration-2/)



Western Specialty Contractors – Des Moines, IA Branch recently completed restoration and waterproofing of Nile Kinnick Stadium in Iowa City, Iowa.

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# Western Specialty Contractors Restores Façade of Historic Litchfield Bank in Preparation for Iconic Clock's Return

ST. LOUIS — Western Specialty Contractors – Springfield, IL Branch cleaned, restored and waterproofed the limestone façade of Litchfield, Illinois' historic First National Bank in preparation for the return of its iconic corner clock.

Located on the southeast corner of N. State and E. Kirkham Streets, the First National Bank of Litchfield has been at the same downtown location since 1860 when it was operated as a private bank until receiving its National Bank Charter in 1889. The bank is perhaps most identified by its large, ornate brass and stained-glass corner clock.

Bank officials decided to restore the bank's façade to coincide with the antique clock's restoration. While the clock was with The Verdin Company for a six-month restoration, the building's façade work got underway.

Western Foreman Jason Lemon used a proprietary cleaning material devised in the field to clean the 163-year-old building's limestone façade, plus the masonry facades of its connecting buildings. He also tuckpointed various areas of the buildings and made minor stone spall repairs where needed, plus re-caulked and wet glazed all the buildings' windows.

Western's scope of work also included cleaning and coating the base of the bank and caulking where the sidewalk meets the building. Lemon applied a water repellent to the entire building and performed some railing and post painting. Western was rehired several months after the façade restoration was complete to install anchorage to secure the restored clock back in place on the building's corner.

The façade project started in April 2022 and was completed in two

months, on schedule, and within budget. The clock was reinstalled in November of that same year.

For more information about Western's masonry restoration services, visit [westernspecialtycontractors.com/masonry-services/](https://westernspecialtycontractors.com/masonry-services/)



*Before the restoration of the bank's façade ...*



*... and after.*

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# NEWS

## New Hampshire Utility Has Latest Entrant to Trade Electricity With Canada

By Wilson Ring | Associated Press

The newest proposal for a major electrical transmission line from Canada that would be able to carry power to New England from Canada, would also be able to send to Quebec renewable energy produced by future power generators off the New England coast or other sources.

The proposed 211-mile, \$2 billion Twin State Clean Energy Link would enter the United States in Canaan, Vt. It would be buried along state highways in Vermont and New Hampshire until it linked to an existing transmission corridor in Monroe that would carry the power to a new substation in Londonderry. From there the power could be distributed throughout New England.

“You can think about the Twin States line almost like battery storage — the line would not need to be ‘always on’ and delivering energy from Quebec to New England,” said a statement from the electric utility National Grid, one of the developers of the proposed New Hampshire project. “Instead, it would be used when there is a need to bring additional clean energy to the region to balance variable resources, such as offshore wind.”

Unlike much of the power currently brought to the United States from Canada that is generated by hydro generation facilities in Quebec, it would also have the ability to deliver power generated by wind and solar facilities in Canada.

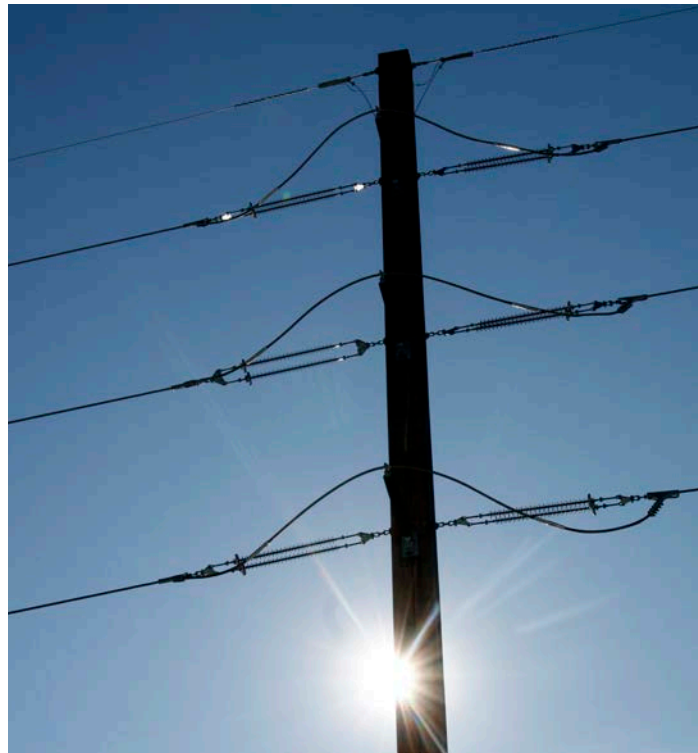
In a statement, Hydro-Quebec said cross-border infrastructure optimizes the use of renewable energy, hydro, wind and solar, in Quebec and the Northeastern United States.

“Even though HQ is not involved with the Twin States project, this project’s business model is a demonstration of how the energy transition is taking shape in our broader region,” the statement said.

For years the Northeastern United States has tried to find ways to take advantage of hydropower produced in Canada and Canadian officials have been eager to sell power in the U.S.

As part of that Hydro-Quebec has agreed to a 25-year contract to sell power for use in New York City via the under-construction Champlain Hudson Power Express. Hydro-Quebec has also agreed to send power to Massachusetts via the stalled New England Clean Energy Connect through Maine.

But now Quebec has its own clean energy needs and doesn’t have power to spare for another major line to the U.S. and the focus is changing to shared power. If approved, the earliest the New Hampshire project could begin construction would be 2026. ■■



Vermont Electric Power Company transmission lines are seen on Feb. 8, 2012, in Waterbury, Vt. A New Hampshire electric utility is offering a new proposal for an electrical transmission line from Canada that would carry renewable power to New England. The proposed 211-mile, \$2 billion Twin State Clean Energy Link would enter the United States in Canaan, Vt. (AP Photo/Toby Talbot, File)

### GOT A STORY TO TELL?

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# Pioneering Nuclear Sludge Retrieval Methods Successfully Trialled at Indoor Water Facility

A PIONEERING new technique to remove sludge from nuclear fuel ponds has been successfully trialled at one of the U.K.'s largest wet test facilities.

The Decommissioning Alliance (TDA) is tasked with installing equipment to allow operators to safely retrieve debris laying at the bottom of fuel ponds at a site operated by the Nuclear Decommissioning Authority (NDA) in order to safely remove and transport the recovered material for safe, long-term storage.

TDA representatives will complete the task by attaching a Bulk Sludge Retrieval Tool (BSRT), which ultimately acts like an industrial Hoover, to a 40-meter Umbilical. The tool will retrieve the sludge and then store it in a safe manner.

To test the new way of working, which includes the use of remotely operated vehicles to lock a hinged double boom arm in position, the team trialled the methods at engineering specialists Forth's Deep Recovery Facility (DRF) in the company's headquarters at Flimby, in Cumbria.

"The work we are carrying out at the site has been ongoing since 2010 and has been instrumental in reducing the inventory in the pond, which in turn reduces the overall risk," TDA Project Manager Scott Bond said. "We are always looking for ways to ensure our work is safer, more efficient and more cost effective for the client, and the new methodology of installing the BSRT and the umbilical has the potential to be a game changer.

"Before implementing the practices live onsite, we need to be 100-percent certain that they are safe and effective, so the trials we carry out are absolutely essential," Bond added. "Being able to successfully test the equipment at Forth's DRF, particularly when it's on our doorstep, was a Godsend for the project because we couldn't find a facility big enough to host the trials; other than the open sea or a dock, but that brings with it more hindrances as the water is very corrosive. Using the excellent indoor facility meant we were able to successfully trial the methods and replicate site conditions on more than one occasion, ensuring the TDA installation team are familiar with the equipment, tooling and installation sequence, when the time comes to putting the learning into live action."

Able to hold 1.2 million liters of water as it measures 22.5 meters long, 10 meters wide and six meters deep, the DRF at Forth is the largest of its kind in the north of England.

To facilitate the tests, engineers at Forth designed and manufactured a frame to attach the equipment, and they provided access scaffolding and operators to deploy the equipment.

"It's been great to be able to play a part in what is such a major development for the nuclear industry," Graham Cartwright, the projects director at Forth, said. "Our DRF has time and again proved vital in providing wet testing for key projects and being in a position to facilitate these trials has been something we are really pleased with."

More details about the Deep Recovery Facility at Forth is available by emailing [info@forth.uk.com](mailto:info@forth.uk.com).



Forth's Deep Recovery Facility, which can hold 1.2 million litres of water, proved key in the sludge retrieval trials carried out by The Decommissioning Alliance.

# NEWS

## Johnson Controls' 2023 Sustainability Report Marks Milestones Towards Net Zero

CORK, Ireland — Johnson Controls, a global leader for smart, healthy and sustainable buildings, has released its 2023 Sustainability Report, marking milestones on the path to achieving net zero in buildings around the world. Johnson Controls reports accelerated progress both in its own sustainability journey and in the reduction of customer emissions.

"Climate change is a key defining theme of this century," said George Oliver, chairman and CEO of Johnson Controls. "We have seven years to cut global emissions nearly in half to reach net zero by 2050 and limit global warming to 1.5 degrees Celsius. With almost 40 percent of those emissions coming from buildings, the consensus among global leaders is that there will be no net zero without decarbonizing buildings. The good news is, we have the technology, financing, partnerships and people to turn buildings from one of the greatest challenges into one of the biggest and quickest solutions toward net zero."

A 2022 International Energy Agency (IEA) emissions report showed that 86 percent of emission reductions in Europe last year came from building improvements. Heat pumps played a major role, with a 38 percent increase in heat pump sales. Globally, the IEA says emissions were kept to below a 1 percent rise, much lower than predicted, thanks in significant measure to unprecedented growth in ener-

gy-efficient equipment, heat pumps, renewable energy and electric vehicles.

Johnson Controls is creating and deploying technology — the smart building trifecta of energy-efficient equipment, clean electrification and systemic digitalization — to accelerate its own net zero journey. The company has already reduced absolute Scope 1 and 2 emissions by 42 percent, or more than 455,000 metric tons, on the way to its 2030 Science Based Target initiative (SBTi) target of 55 percent. The company is ahead, too, on reducing absolute Scope 3 customer emissions, achieving a reduction of 14 percent, or more than 18 million metric tons, on the way to its 2030 SBTi target of 16 percent.

"To help lead the way to a net zero future, we have committed to ambitious sustainability goals," said Katie McGinty, vice president and chief sustainability and external relations officer at Johnson Controls. "The numbers show that our smart building technologies and as-a-service financing and partnership models are having tremendous impact in cutting energy, emissions and cost in our own operations and for our customers. We can accelerate climate progress and advance business objectives at the same time — just in time for the action the planet needs now!"

Driving climate progress is a significant factor in the company's



Johnson Controls' 2023 Sustainability Report shows accelerated progress in sustainability and reduction of emissions both for the company and for customers at large.



growth and vitality, and Johnson Controls continues to innovate, investing 90 percent of R&D into new sustainability-related technologies in fiscal year 2022. The company also is addressing hard-to-abate steel production and embodied carbon. Over 70 percent of Johnson Controls steel purchases in the United States and 45 percent globally are from recycled scrap materials, (Recycled steel has up to 80 percent less embodied carbon than primary steel).

In addition, the company has stepped up to mobilize financing and meet the capital constraints faced by so many companies today, by introducing “Net Zero as a Service.” This partnership model delivers on key performance objectives for customers — from energy, emissions, and cost reductions to healthy, smart workspaces — without upfront capital costs. “Net Zero as a Service” redefines risk by guaranteeing energy savings and paying project costs out of the savings. Since January 2000, Johnson Controls’ innovative financing structures have helped partners and customers avoid over 37 million metric tons of emissions, and they are set to save partners over \$7.8 billion in energy and operational costs over their project terms.

For its ESG work with customers and in its own operations, Johnson Controls has been ranked as one of the World’s Most Ethical Companies for 16 years. The company earned a platinum rating from EcoVadis, a top ESG rating from Sustainalytics, and was distinguished as a climate leader by the CDP, Corporate Knights, and the Financial Times. The company received an AAA rating from the MSCI and was named to the Clean200 for its high proportion of sustainable reve-

nues. Johnson Controls was honored as one of the 100 Best Corporate Citizens for the 17th year by 3BL, and was named to Fortune’s Change the World list.

Johnson Controls attributes its global sustainability leadership to a 100,000-strong team, from the C-suite to the front line and factories. Compensation for the executive committee is tied to sustainability and diversity performance goals. Employees volunteered more than 45,800 hours in 2022, 86 percent of which supported U.N. Sustainable Development Goals. The company is also investing in the rising generation of diverse, sustainable leaders through a wide range of scholarship, training and internship programs.

To read the full 2023 Sustainability Report, please visit [www.johnsoncontrols.com/2023Sustainability](http://www.johnsoncontrols.com/2023Sustainability).

- *CEO and CSO stress 7-year countdown to cut the nearly 40 percent of global emissions*
- *caused by the global building sector*
- *Company ahead of schedule on its net zero journey, already reducing absolute emissions across operations by 42 percent since 2017*
- *Innovative technologies reduced customer emissions by 14 percent since 2017*
- *Consistently ranked as a global leader for sustainability, ethics, social impact and employee experience* 🏆

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# MEMBER NEWS

## CEAC Associate Members Honored for Outstanding Performance in Safety and Construction

CROWN POINT, Ind. — Among the nearly 60 Northwest Indiana construction companies that were honored for their outstanding performances in safety and project excellence at the Construction Awards Banquet held in Merrillville, Ind., were several CEAC Associate Member organizations and individuals. Construction industry firms from throughout the region greatly exceed national averages in safety performance and project outcomes, and the banquet is a celebration of those achievements.

The event is coordinated as a joint effort by the Northwest Indiana Business RoundTable (NWIBRT) and the Construction Advancement Foundation (CAF). NWIBRT's awards focus specifically on safety and CAF's awards focus on multiple areas of construction performance and project outcomes.

Awards were given to a variety of firms based on topics like safety performance figures, jobsite innovation, collaborative efforts to improve construction, professional development, and more.

The following CEAC Associate Members were among the 2023 Northwest Indiana Business RoundTable (NWIBRT) Award Winners:

**Contractor of the Year:**  
Hard Rock Concrete Cutters ("Under 500,000 hours worked in NWI" category)

**Excellence Award:**  
AMS Industries, Inc.  
Hard Rock Concrete Cutters

**Recognition Award:**  
Hayes Mechanical

**Outstanding Craftspersons Safety Leader Award:**  
David Adams, Hard Rock Concrete Cutters  
Matt Zuzich, Hard Rock Concrete Cutters

"At the heart of successful construction projects lies an unwavering commitment to safety. Companies in NWI continually strive to improve their safety practices, even amidst the most challenging of circumstances. We are honored to recognize and celebrate these companies, whose dedication to safety not only sets them apart but elevates the entire regional construction industry," said NWIBRT Safety Committee Chair and Cargill Health & Safety Manager Rick A. Foor.

"It is truly inspiring to witness the ingenuity and superior craftsmanship that is consistently demonstrated in construction projects throughout our region. We take great pride in recognizing and honoring the remarkable achievements of these outstanding craftspeople and contractors. Their dedication and commitment to excellence are evident in their daily work, as they lay the foundation for the future of our communities and serve as leaders for others in the construction industry," said Dewey Pearman, executive director of CAF.

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## ***CHIEF ENGINEER MEMBER INFO AND REMINDERS***

Here are a few things to keep in mind about your membership and Chief Engineer events.

- Members are invited to monthly meetings that take place once a month October – May
- Meeting topics, speakers, and times can be found online at [www.chiefengineer.org](http://www.chiefengineer.org)
- A flyer will also be emailed out with relevant information and a meeting registration link
- Membership dues are good for one year. If not renewed, your membership becomes Inactive and you will need to renew before or upon entering events

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Contact Ken Botta at [kbotta@sbcglobal.net](mailto:kbotta@sbcglobal.net) for details.

[www.chiefengineer.org](http://www.chiefengineer.org)

# TECHLINE

## At the Core of Control System Design Are Standards, Standards and Standards

As the famous saying goes, the three most important factors in real estate sales are location, location and location. For Distributed Control Systems (DCS) used to control sophisticated processes in many industries, the equivalent can be just as easily summed up as “standards, standards and standards.”

A DCS system serves as the hub of a processor’s operations, and controls and monitors key variables such as flow, applied temperatures, pressure, level and material conveying/handling. The DCS’s HMI collects all the data from the production equipment and presents it in a highly “human-factored” manner for an operator.

Still, there are infinite variables related to the type of equipment, the material being processed, the operator’s actions, and the control system. The DCS must therefore be designed to handle common, expected disturbances as well as unexpected anomalies in a predictable way.

Unfortunately, designing a DCS application from scratch is like staring at a blank sheet of paper; it can be configured in almost any way imaginable. This is a two-edged sword that can lead to a robust system that delivers precise and predictable control if done carefully, or it could lead to lost product, process interruptions, and even safety issues when done poorly.

The potential for poor configuration only accentuates the need for established standards and best practices in DCS design. Many professional organizations and associations define the standards and best practices for process control systems. However, most provide only general guidelines that can be applied to any distributed control system.

But as Robert M. Ard, Director of Applications Engineering at Valmet explains, there are many other ways to achieve a level of standardization in the programming and design to create a robust DCS. Valmet is a leading global developer and supplier of process technologies, automation, and services for the pulp, paper, energy, marine and other process industries. In January 2023, the company completed the acquisition of the popular D3 Control System from NovaTech Automation.

“Standardization begins with a commitment to a shared design philosophy, adoption of best practices, and utilization of tools and techniques that reduce programming complexity and time for similar processing equipment,” explains Ard.

### Start With a Well-Defined Design Philosophy

According to Ard, every application configuration should begin with a well-defined design philosophy. Most DCS applications are created and maintained by teams of engineers, so they should all be rowing in the same direction.

“The best results can only be achieved when all contributors to the

overall process control application follow the same best practices and techniques,” says Ard.

When this is not the case, the result is unintended process errors and a system that is difficult to maintain.

“Every engineer contributing to the application should strive to write their logic in the same way,” Ard adds. “The standard practices used should be well documented and taught to everyone responsible for the control system.”

In fact, it would be an appropriate indication of a well-designed DCS application if control systems engineers cannot identify the specific programmer by looking at the program logic or by observing its execution.

One specific area of DCS design that illustrates the benefit of an established, shared philosophy is alarm management. In process automation, an alarm is defined as an audible and/or visible means of indicating to the operator an equipment malfunction, process deviation, or abnormal condition requiring an operator response.

Poorly designed and maintained alarm management systems can overwhelm operators with chattering and nuisance alarms under normal conditions and debilitating alarm floods when abnormal states emerge. When this occurs, it can be difficult for operators to ascertain and act on the most critical alarms, contributing to abnormal situations, lost production, and even serious accidents.

Recently, organizations like ANSI (American National Standards Institute) and ISA (International Society of Automation) have released updated guidelines related to alarm management. The ANSI/ISA 18.2 Standard addresses the entire lifecycle of alarm management from design and configuration through performance monitoring, auditing, and enforcing for the life of the control application.



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“Basically, what the ISA committee determined was that an alarm should only be used if it requires an operator’s response,” explains Ard. “And that is probably the number one thing most processing plants violate. They use alarms for all kinds of notifications, alerts, and reminders.”

Leading process automation companies like Valmet have incorporated more of a standards-based approach to application development, focusing on differentiating alarms that require immediate attention from less urgent notifications, alerts, and messaging.

According to Ard, Valmet’s D3 DCS is designed to meet or exceed the requirements outlined in the ISA-18.2, albeit with slightly different terminology. This includes limiting alarms, supporting alarm prioritization, alarms by classification, and allowing dynamic alarm management.

#### Standardization of the HMI

To facilitate operator monitoring and control, DCS utilizes Human Machine Interfaces (HMI) for a visual overview of process systems and to monitor critical status and control information.

The Valmet D3 interface, for example, displays real-time process information in a complete customer-oriented graphical HMI. With standardization at top of mind, even seemingly minor details in the design of the presentation of the information have been considered in Valmet’s high-performance HMI layouts. Examples include consistent alarm notification terminology and phrasing, location on the screen, and color-coding.

“A properly designed graphical user interface improves situational awareness, reduces workload, and enables the operator to view the entire process at-a-glance so they can focus on mitigating abnormal situations,” says Ard.

Although the best practices for any control system have at its core pursuing a standardized approach to configuring the application software, the challenge of designing a system from the ground up is admittedly a daunting task.

Ard is writing a comprehensive guide to control system design to assist processors in this endeavor, tentatively titled How to D3. The

book is expected to be published in Q4 of 2023. Among other general guidelines control system engineers should know or consider when tackling any DCS project, the book elaborates on the critical role of standardization and gives specific examples of Unit-Relativity and programming specific to the Valmet D3.

“It’s clear that a properly designed DCS can deliver robust and predictable control with constant monitoring of process conditions, clear and concise communications with operators, and smart alarm management as long as we keep in mind the three most important factors — it’s all about standards, standards and standards,” says Ard.

For more information, visit [www.valmet.com](http://www.valmet.com) or call (410) 753-8300.



The Valmet D3 interface displays real-time process information in a complete, customer-oriented graphical HMI.



A DCS system serves as the hub of a processor’s operations and controls and monitors key variables such as flow, applied temperatures, pressure, level, and material conveying/handling.

An advertisement for Christopher Glass Services, Inc. The background is a photograph of a modern glass and steel building facade. The text is overlaid on the image. At the top, it says "Christopher" in a large, stylized font, followed by "GLASS SERVICES, INC." and the phone number "(312) 256-8500". Below this is a logo featuring a crown and two figures. A yellow box contains the text: "24/7 Emergency Service / Board Up", "Complete Door Maintenance - Revolving Entrances", "Glass Replacement - Storefronts - Curtainwalls -", and "Mirrors - Interior Glass Doors - Sidelites". At the bottom, it provides the website "www.CGSCChicago.com" and email "service@cgschicago.com".

# TECHLINE

## LSU Mechanical Engineering Professor Designs Non-Metal Battery to Replace Lithium Battery

BATON ROUGE, La. (GLOBE NEWSWIRE) — As the demand for electric vehicles, cell phones, and computers continues to grow, so does the demand for lithium used in lithium-ion batteries. While this soft, alkali metal known as “white gold” is abundant in certain countries, the mining process and safety issues are of concern to researchers. One such researcher is LSU Mechanical Engineering Associate Professor Ying Wang, who is using a Board of Regents grant to design a non-metal rechargeable battery that could one day replace lithium batteries on Earth and in space.

“Lithium-ion batteries have good performance but several serious issues,” Wang said. “It’s not sustainable and is very expensive, and the U.S. does not have deep reserves for lithium. Also, if you are extracting lithium from mines, you are using a tremendous amount of water, which has a severe impact on the environment.”

Wang and her group of LSU ME students have been working on a non-metal battery with a water-based electrolyte that is safer than an electrolyte in a lithium battery.

“Lithium is not a stable metal, and the organic electrolyte in a lithium-ion battery could be flammable,” Wang said. “There have been lithium battery explosions in the news. This is a recurring problem because when lithium batteries fail or overheat, they release flammable, toxic gases that can spark a fast-spreading fire. My group is designing an ammonium-ion battery that is much safer, lighter, more affordable, and can be biodegradable. It can also be made thin and flexible, so it can twist and bend.”

Wang has spoken with NASA personnel about the battery and its potential use in space.

“NASA’s future space-exploration systems require safe, high-power-density, high-energy-density batteries,” Wang said. “Although lithium-ion rechargeable batteries have commonly been used in space systems, the safety issues cause concern and hinder their future applications.”

Wang’s ammonium-ion battery has an aqueous electrolyte containing high-concentration salts that result in a significantly depressed freezing point for operation at sub-zero temperatures in space systems. The anti-freezing electrolyte can be simply prepared by dissolving ammonium salt in water. The salt concentration will be varied and optimized to achieve the lowest freezing point, maximized ionic conductivity, and electrochemical performance of the battery. The battery will be tested under extreme conditions as is required by NASA.

“This study is expected not only to open a new direction of research on non-metal batteries but will also enhance NASA research and

technology while contributing to the overall research infrastructure, science and technology capabilities, diversity in higher education, and economic development of Louisiana,” Wang said. ☐



LSU Mechanical Engineering Associate Professor Ying Wang has designed a non-metal rechargeable battery with the goal of eventually replacing lithium batteries both on Earth and in space.

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# U.S. Boiler Company Introduces Condensing Boiler App for Installation and Service

LANCASTER, Pa. — U.S. Boiler Company has introduced the new USB-Connect smartphone application to expedite and streamline installation, service and troubleshooting of all its current and recent condensing and combi boilers.

The app, which interfaces with all models of Alta, Aspen, Alpine and K2 boilers through a Bluetooth adapter, allows technicians to access the boiler control via smartphone or mobile device rather than the boiler display.

USB-Connect actively guides boiler technicians with step-by-step start-up, troubleshooting, and service wizards. Start-up wizards include on-phone LP conversion, customer setpoints and other adjustments. Troubleshooting wizards include questions like “Is boiler not running?” or “Is boiler not responding to DHW demand?”, among others. These issues and visible active alarms are often solved with a few taps on the smartphone screen.

The new app features a comprehensive control dashboard, providing instant status, operating details, diagnostic tools, literature and many other resources. All boiler adjustments can be made from the app, including setpoint temperatures, DHW priority, access to error codes, manipulation of fan speeds, configuration of outdoor reset parameters, etc.

The app also provides live software and firmware upgrades and instant, fingertip access to all manuals and documents. Operating details and service records are viewable on- and off-site, and system snapshots can be archived for later use. Should customer service be needed, U.S. Boiler tech support can view the system in real time when connected through a technician's smartphone. Jobsite photos can also be posted to the app.

Safe and secure, USB-Connect guides technicians through all service



*U.S. Boiler Company's new USB-Connect smartphone application requires only download of the free mobile app and the USB-Connect Bluetooth adapter kit.*

and installation procedures while providing powerful diagnostic tools. This allows technicians to work quickly and accurately, regardless of their familiarity with the product or level of training.

USB-Connect requires only download of the free mobile app and purchase of the USB-Connect Bluetooth adapter kit.

The USB Connect app is available on the App Store (Apple) or the Play Store (Android) For more information, please visit [www.usboiler.net](http://www.usboiler.net)

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# TECHLINE

## Study Exposes Construction and Manufacturing Sector's Most Common Passwords

The construction and manufacturing sector's employees working for the world's richest companies use very poor passwords to secure business accounts, reveals new research by NordPass. While cybersecurity experts repeatedly urge businesses to take better care of corporate accounts, passwords such as "123456," "password," and "aaron431" still make it to the top of the construction and manufacturing industry's list.

Although NordPass looks at the change in Internet users' password habits year-round, this year, the company specifically investigated passwords that employees of the world's biggest companies from 31 countries use to secure business accounts. The researchers compiled 20 industry-specific passwords lists.

"On one hand, it is a paradox that the wealthiest companies on the planet with financial resources to invest in cybersecurity fall into the poor password trap," says Jonas Karklys, CEO of NordPass. "On the other hand, it is only natural because Internet users have deep-rooted unhealthy password habits. This research once again proves that we should all speed up in transitioning to alternative online authentication solutions."

### "Dummies," "sexy4sho," and Other Questionable Passwords

According to the study, the passwords "password" and "123456," which shared the top two spots in last year's list of the world's most common passwords, are also popular among the largest companies' employees. Across all 20 analyzed industries, both of these passwords were found to be among the seven most commonly used passwords. The word "password" was the number 3 most-trending pick among the construction and manufacturing sector's employees, and "123456" ranked 2nd.

Other industries were also creative. The password "dummies" ranks

6th among consumer goods sector employees, "sexy4sho" — 16th among real estate employees, and "snowman" — 11th in the energy field.

### Common Inspiration for Passwords

Just like with regular Internet users, dictionary words, names of people and countries, and simple combinations of numbers, letters, and symbols make up most passwords presented in the research.

However, the remaining 32 percent indicate another interesting trend. The world's wealthiest companies' employees love passwords that directly reference or hint at the name of a specific company. The full company name, the company's email domain, part of the company's name, an abbreviation of the company name, and the company product or subsidiary name are the common sources of inspiration. These passwords are making half of the construction and manufacturing sector's list.

"These types of passwords are both poor and dangerous to use," says Karklys. "When breaking into company accounts, hackers try all the password combinations referencing a company because they are aware of how common they are. Employees often avoid creating complicated passwords, especially for shared accounts. Therefore, they end up choosing something as basic as the company's name."

### Wide Representation of Countries and Industries

The analysis of the world's wealthiest companies' passwords was conducted in partnership with independent third-party researchers specializing in research on cybersecurity incidents. They looked into the world's 500 largest companies by their market capitalization, which represented 31 countries and 20 industries.

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The United States (46.2 percent), China (9.6 percent), Japan (5.8 percent), India (4.2 percent), the United Kingdom (4 percent), France (3.8 percent), and Canada (3.6 percent) are the countries most represented in this research. Also, most of the companies analyzed fell under the finance, technology and IT, and health care sectors.

### Passwords Will Inevitably Die

The study complements a series of password-related research projects NordPass has delivered throughout the years. In 2021, the company looked into the passwords that Fortune 500 companies use, and in 2022, investigated the password habits of top-level business executives. Moreover, NordPass annually presents the "Top 200 most common passwords" study, which broadly covers the password trends of Internet users.

"While password trends slightly vary each year across different audiences, the general take is that people continuously fail with their password management, and the world desperately needs to switch to new online authentication solutions such as passkeys," says Karklys.

Various progressive businesses such as Google, Microsoft, Apple, PayPal, KAYAK, and eBay have already adopted passkey technology and are offering their users passwordless login. According to Karklys, in no time at all, other online companies will start following this trend. Therefore, NordPass has developed a solution to store clients' passkeys and is developing a tool for businesses to easily integrate passkey support to their websites.

### Tips to Secure Business Accounts

According to an IBM report, in 2022, stolen or compromised credentials remained the most common cause of a data breach in companies, accounting for 19 percent. Karklys says that by implementing a few cybersecurity measures, businesses could avoid many cybersecurity incidents.

1. Ensure company passwords are strong. They should consist of random combinations of at least 20 upper- and lowercase letters, numbers and special characters.
2. Enable multi-factor authentication or single sign-on. While the MFA set up on another device, connected with email or SMS codes guarantees an additional layer of security, single sign-on func-

## Construction & Manufacturing

### Top 20 Industry Passwords

- |                                  |                                 |
|----------------------------------|---------------------------------|
| 1. part of the company's name*   | 11. 12345                       |
| 2. 123456                        | 12. company's email domain.com* |
| 3. password                      | 13. company's email domain.com* |
| 4. aaron431                      | 14. 111111                      |
| 5. part of the company's nameeu* | 15. 1234                        |
| 6. PART OF THE COMPANY'S NAME*   | 16. linkedin                    |
| 7. part of the company's name1*  | 17. company's email domain.com* |
| 8. pass1                         | 18. owned company's name*       |
| 9. part of the company's name*   | 19. 12345678                    |
| 10. company name*                | 20. 123456789                   |

\*This password is directly referencing a company. We are not naming the exact business. We note the format in which this password was used, for example, the abbreviation of the company's name, part of the name, or the name combined with other words or symbols.



Construction and manufacturing sector's employees often have been found guilty of using easy-to-crack passwords.

tionality helps reduce the number of passwords people have to manage.

3. Critically evaluate whom to grant account credentials. Access privileges should be removed from people leaving the company and passed on only to those who are in need of certain access.
4. Deploy a password manager. With a business solution, companies can safely store all their passwords in one place, share them within the organization, ensure their strength, and effectively manage access privileges.

### Methodology

The poor passwords list was compiled in partnership with a third-party company specializing in cybersecurity incident research. Researchers analyzed data that affected the world's 500 largest companies by their market capitalization. The analyzed data was categorized into 20 different industries. The researchers looked into the top 20 passwords used in each industry. 📊



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# NEW PRODUCTS

## Laser Debris Shields Made From Sapphire for Superior Optics Protection

A line of sapphire laser debris shields for use on high-power lasers to protect the optical components from steel slag and splatter has been introduced by Laser Research Optics of Providence, R.I.

Laser Research Sapphire Cover Glass for fiber lasers prevent the laser's optical components from damage caused by slag and splatter, and are much more robust than fused silica debris shields. Featuring Mohs 9 hardness, these sapphire laser debris shields reduce the number of required lens changes on lasers from 4 kW and above and extend their service life.

Second only to diamond in terms of hardness, Laser Research Sapphire Cover Glass reduces focus shift and the deterioration of beam quality, they have A/R coatings on both sides to provide transmission of > 99.5 percent @ 1.06 microns with > 80 percent @ 650-670 nm. These laser debris shields have a 10-5 scratch-dig finish and 1/4 wave transmitted wavefront.

Laser Research Sapphire Cover Glasses are priced according to size and quantity. Price quotations are available upon request.

For more information contact: Laser Research Optics, A Division of Meller Optics, Inc., Scott Rouillard, Sales Manager, 120 Corliss St.,

Providence, RI 02904, call (888) 239-5545, FAX (401) 331-4004, e-mail [scott@laserresearch.net](mailto:scott@laserresearch.net) or visit [www.laserresearchoptics.net](http://www.laserresearchoptics.net)



Laser Research Optics' new line of sapphire laser debris shields are designed for use on high-powered lasers to protect the optical components from steel slag and splatter.

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# Blade Cartridges & Inserts Provide Twice the Welding Pipe Prep Cutting

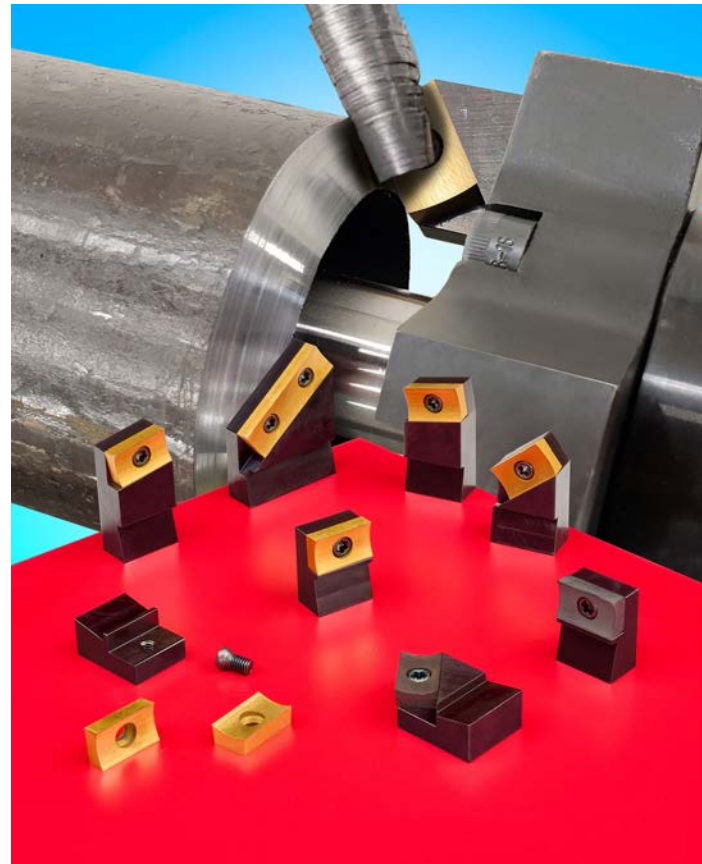
A full line of cutter blades featuring two cutting edges that insert into cartridge holders for use with their Millhog® line of welding end prep tools is being introduced by Esco Tool of Holliston, Massachusetts.

The Millhog Razorback Cartridge series consists of blade inserts that mount with a set-screw into a cartridge holder and feature two cutting edges which are easy to flip over; providing a fresh cutting surface. Standard blade inserts fit into the cartridges which include 30°, 37-1/2° and 10° bevels and a 90° flat facing type.

Made from T-15 tool steel and TiN coated, the Millhog Razorback Cartridge Series cutter blades can pull a thick chip without cutting oils. Hard lube blades are also offered for highly alloyed materials. This cartridge series is ideally suited for use with the Wart®, Mini®, Prepzilla®, Commander®, Dictator®, Dictator II® and Terminator® Millhogs.

Millhog Razorback Cartridge Series blades are priced from \$38.00, and the holders are \$45.00. Literature and pricing are available on request.

For more information, contact Esco Tool – A Unit of Esco Technologies, Inc., Matthew Brennan, Marketing Director, 75 October Hill Rd., Holliston, MA 01746, call (800) 343-6926, FAX (508) 359-4145, email [matt@escotool.com](mailto:matt@escotool.com) or visit [www.escotool.com](http://www.escotool.com)



Esco's Millhog Razorback Cartridge series consist of blade inserts made from T-15 tool steel and are TiN coated, and can pull a thick chip without the need for cutting oils.



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# NEW PRODUCTS

## RenewAire Introduces First Phase of HE Series Commercial ERV Redesign

WAUNAKEE, Wis.—RenewAire®, a leading manufacturer of HVAC and indoor air quality (IAQ) products, is redesigning its HE Series of commercial energy recovery ventilators (ERV) with new features and designations.

The new HE10 replaces the HE1X and the new HE07 joins the HE Series as a redesign of the former EV450 ERV. The new HE Series redesigns offer backward curved impellers and EC motors as a standard. The HE10 and HE07 also have significant CFM increases in ranges of 250-1,150-CFM and 200-700-CFM, respectively.

The HE07 offers greater balancing capabilities, due to independent exhaust and supply air blower motors, versus the former EV450's single blower motor. The dual motors enable field-adjustable exhaust/supply air balance ratios for precise efficiency and effectiveness.

Both units' factory-installed isolation dampers will reduce jobsite and contractor installation time.

The redesign also includes a factory reorganization to accelerate production and reduce lead times on USA-assembled units. Factory-installation, integration and testing production time have been significantly reduced for units with standard and optional controls. All units are assembled with Renewaire's Quick Response Manufacturing (QRM), a manufacturing production streamlining methodology developed by the University of Wisconsin-Madison.

The HE Series' other features include:

- Latest generation of UL-listed G5 static-plate core
- Dial-A-Flow digital controller or compatible BMS controlling is available
- Tested and passed under AHRI 1060
- Differential pressure control accommodates both 2-inch MERV 8 standard filters or higher static with 2-inch MERV 13 option
- New motor, impeller and AC/DC power supply improves output

- and significantly reduces operational dB level
- Adds specification flexibility with indoor/outdoor and horizontal/vertical configuration options
- Meets IEC-2021 Fan Efficiency Index (FEI) guidelines
- An industry-leading 10-year structural and performance warranty for the static-plate core, two-year warranty for commercial products

The HE10 and HE07 represent the first phase several phases of product introductions that will include other model redesigns in 2023 and beyond.

The HE Series promises to help engineers increase IAQ while also helping mitigate infectious pathogens and other airborne microbes such as allergens, mold and mildew. For example, ASHRAE recommended increased outdoor air ventilation rates and supply/exhaust neutral air balancing during the recent pandemic. The HE Series can reduce the costs of additional outdoor air costs via energy recovery. Now with separate blower motors, the HE Series provides easy field-adjustable air balancing to accommodate any future ASHRAE recommendations.

For more information, please visit [www.renewaire.com](http://www.renewaire.com), email [marketing@renewaire.com](mailto:marketing@renewaire.com) or call 800-627-4499.



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The HE10 and HE07 replace the HE1X and EV450, and feature additional performance and state-of-the-art EC motors, backward curved impellers and other technological innovations.

# Little Giant Expands Product Line to Include More Builder Grade Pumps

FORT WAYNE, Ind. — Franklin Electric Co., Inc., has announced that its Little Giant brand has expanded their sump pump lineup to better equip professional plumbers and installers.

The new products include:

- BSP33 Series (1/3 hp) and BSP50 Series (1/2 hp) and 5.5 ASPA Series (1/4 hp) builder grade sump pumps
- BSC33 Series (1/3 hp) and BSC50 Series (1/2 hp) sump/effluent pumps
- BSWC50 Series (1/2 hp) sewage pump
- SPBS 1-HF Series battery backup system

“With an 80-year history, Little Giant is a brand that homeowners and installers know and trust to solve pumping challenges,” said Wayne Neault, Business Unit Director, Residential and Specialty Solutions. “This product expansion allows installers to not only provide homeowners with this level of confidence at more price points, but it also helps plumbing professionals streamline ordering from a proven brand.”

All products also feature Little Giant’s proven durable construction and feature a two-year warranty.

Information on the expanded product lineup is available at [www.littlegiant.com/products/sump--effluent-pumps--systems/](http://www.littlegiant.com/products/sump--effluent-pumps--systems/)



*Little Giant has introduced its Builder Grade line of sump pumps to better equip plumbers and other contractors.*

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# NEW PRODUCTS

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Features of the LevelBest Drainage System include a domed top for protection during the concrete pour and heavy-duty nickel bronze trim. The system is primer tapped and can be used with tile rings. Cleanouts include a countersunk test plug.

Available in 3" x 4" and 4" sizes, configuring the right drainage system for the job is quick and easy. Simply choose the rough-in and trim style or select from pre-configured complete system options to have everything packaged together neatly in one box.

Select products have new packaging that makes merchandising at the counter nice and easy, and that protects the product on the job site until ready for use. The product is available now and ready to ship.



*Jones Stephens' LevelBest Drainage System in 3" x 4" and 4" sizes are quick and easy to install, ensuring a professional installation every time.*

For more information, visit [www.jonesstephens.com](http://www.jonesstephens.com).

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# Vlier Celebrates 80 Years in Business With New Line of Ceramic Ball Plungers

HOPKINTON, Mass. — Vlier Products, a unit of Hutchinson Aerospace & Industry, is celebrating 80 years of innovation in manufacturing by unveiling an all-new line of ceramic ball plungers that can be used for indexing, locating or positioning in a variety of applications. The Posi-Hex™ ceramic ball plunger, the first product to be released in this new line, is now available. Its innovative design automates and simplifies the assembly process for manufacturers, while the unique ceramic makeup allows the part to be incorporated into a new array of environments.

“Ceramic is a game changer for us; it’s an extremely hard, clean-room-compatible material that is also corrosion, wear and electricity resistant with unique thermal properties,” explained Russ Mitchell, Vlier national sales manager. “It lets engineers meet specific criteria for previously unattainable environments. Ceramic’s inherent benefits make this new line of products ideal for medical, aerospace, oil and gas, marine and electric vehicle applications.”


This announcement is just the latest chapter in Vlier’s eight-decade history of innovation. Founded in 1943 in Burbank, Calif., Vlier initially supported American efforts in World War II, engineering parts for use in military build-ups of bombers, fighter planes and battleships. After the war ended, the company created what would become its flagship product, the Vlier Pin, in 1949. Designed to fixture small parts in tight, compact spaces, the pins have perfected many manufacturing lines and products.

“Eighty years of innovation is not something many businesses can claim, and it’s certainly not something we take for granted,” said Thomas Foley, general manager. “I believe our continued success is tied to the precision engineering of each of the thousands of standard parts in our catalog and the fact that we are still making significant additions. After eight decades, we’re not just growing our market share — we’re growing the market.”

As the company moves into its 80th year, Mitchell noted they are excited to continue expanding its product catalog and branching out into additional markets with its ceramic parts. Vlier’s products are available exclusively through a global distribution network. ■■



*Vlier’s latest innovation is a testament to the manufacturer’s ingenuity and precision engineering.*



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# EVENTS

## 2023 ASHRAE Annual Conference

June 24-28, 2023  
JW Marriott Tampa Water Street Headquarter Hotel  
Tampa, FL

Registration is now open for the 2023 ASHRAE Annual Conference which will take place June 24-28, at the JW Marriott Tampa Water Street in Tampa.

"ASHRAE's Annual Conference is the perfect place for built environment professionals to learn new concepts to help improve the design, construction and operation of buildings and systems," said 2022-23 ASHRAE President Farooq Mehboob, Fellow ASHRAE. "It is always wonderful when our members are able to come together to share experiences and ideas. We look forward to an exciting conference in beautiful Tampa."

The conference will include tours, social events, award recognitions and a technical program featuring more than 90 sessions on seven conference tracks. Technical sessions will focus on the urgency of addressing the climate crisis, including measures to reduce human impact on the natural environment and strategies for making the built environment more resilient and sustainable.

Conference tracks addressing climate change are as follows:

- *Pathway to Net Zero and Decarbonization* – Highlights case studies, research, tools, and strategies to reduce carbon impact and achieve net zero energy communities.
- *Future Proofing the Built Environment* – Focuses on innovative technologies and strategies to reimagine the relationship with the built environment in the wake of weather extremes affected by climate change, as well as energy supply disruptions and shortages, methods of designing, constructing and operating buildings and HVAC&R systems for resilience and sustainability.
- *Research Summit* – Features active research, and the exchange of research findings, critical to the development of the HVAC&R industry and built environment. The track includes a partnership with ASHRAE's archival journal, *Science and Technology for the Built Environment*.

Remaining tracks include:

- *Building Automation and Control Systems*
- *Professional Development and Education*
- *Fundamentals & Applications*
- *HVAC&R Systems and Equipment Fundamentals & Applications*

The plenary session will feature a keynote presentation from David Dylan Thomas, author of *Design for Cognitive Bias* and creator and host of *The Cognitive Bias* podcast.

During the President's Luncheon, on Monday, June 26, incoming 2023-24 ASHRAE President Ginger Scoggins, P.E., Fellow ASHRAE, will present her inaugural address and share the Society theme for the coming year, "Challenge Accepted: Tackling the Climate Crisis." The 2023-24 officers and directors will also be installed.

ASHRAE Learning Institute (ALI) will offer full-day seminars and half-day courses and ASHRAE certification exams will be administered during the week. The Society will conduct business, committee and technical meetings in the weeks leading up to, and during the conference.

For complete information and registration for the 2023 ASHRAE Annual Conference, visit [ashrae.org/2023Annual](http://ashrae.org/2023Annual).

### 2023 ASHRAE Building Performance Analysis Conference

Sept. 11-13, 2023  
Hyatt Regency Austin  
Austin, Texas

ASHRAE will host the annual Building Performance Analysis Conference September 11-13, 2023 at the Hyatt Regency Austin, in Austin, Texas. This will be the tenth consecutive ASHRAE modeling conference and 12th overall. Designers, Architects, Consulting Engineers, Building Owners, Principals of Firms, Researchers, Utility Providers, Policy Experts, Contractors and Facility Managers will address the practices of energy modeling and building performance simulation using existing simulation tools, software development and future simulation research and applications.

The technical program will consist of keynote speakers, invited speakers, a call for presentations and the 9th ASHRAE LowDown Showdown.

The theme of the conference is: Holistic Building Analysis: Linking Operational Energy, Embodied Carbon and Comfort.

The technical program will address topics such as:

- Approaches to Modeling Future Weather, Climate and Extreme Events
- Modeling Advances - Tools and Workflows
- Modeling for Carbon and Embodied Energy
- Occupant Health, Wellbeing and Comfort
- Modeling Existing Buildings
- Thermal and hygrothermal (envelope) modeling
- Lighting and Daylighting
- Resilience
- Intelligent Building Operations - Grid Interactions and Distributed Energy Resources
- CFD Applications for Architectural Decision Making
- Urban and Community Scale Modeling
- Intelligent Building Operations - Efficiencies and Load Management
- Energy Equality, Access and Justice





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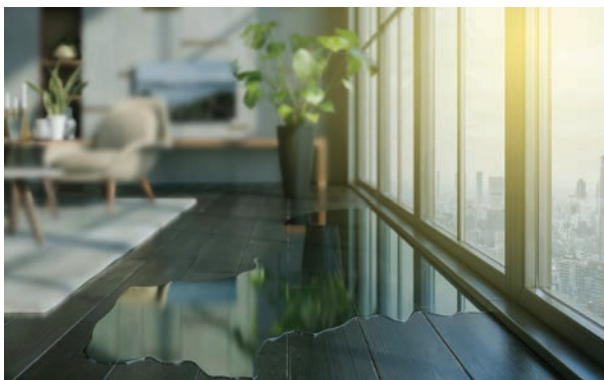
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- B: 1981
- C: 1971
- D: 1961

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# ASHRAE UPDATE

## ASHRAE Certification Program Adds New Building Decarbonization Related Job Tasks to Exams

ATLANTA — ASHRAE recently approved Job Task Analyses for the Building Energy Modeling Professional (BEMP) and High Performance Building Design Professional (HBDP) certification exams to support building decarbonization efforts. The new and updated job tasks resulted from a job task analysis study, which included an industry-wide survey in which respondents were asked to rate how important and frequently the job tasks are performed.

The HBDP exam outline will include the addition of a subdomain entitled “Carbon Emissions Compliance,” along with several carbon emissions-related updates to existing job tasks. The BEMP exam outline will include a new “Greenhouse Gas (GHG) Emissions Analyses” subdomain. There will be a redistribution of exam questions across both programs.

“Completing Job Task Analyses on our certification exams ensures they maintain relevancy as the design industry changes and adapts for new skills required by design professionals to show competency in the field,” said 2022-23 ASHRAE Certification Committee Chair Kimberly R. Cowman, P.E., HFDP, LEED AP. “The Subject Matter Experts (SMEs) on our BEMP and HBDP exam subcommittees acknowledged that a change in the knowledge and skills required to perform their respective jobs was shifting with an increased focus on building decarbonization. Industry-wide Job Task Analysis surveys validated this shift in the industry, which led to updating these two certification programs to address the changing industry needs.”

ASHRAE is experiencing a growing demand for certification, with 65 percent more applications received through February 2023, over the same time last year. The demand is driven by employers who recognize the importance of workforce development both for retention and for the verifiable expertise needed to tackle the challenges of designing high performance buildings.

“The updated and new building decarbonization related job tasks will serve as a roadmap for the professional development hours needed for recertification by current certificants,” said Cowman. “Thanks to these Job Task Analyses, applicants, as well as employers, customers and the public can be assured that the job tasks tested on the respective BEMP and HBDP certification exams will validate competency against the knowledge and skills needed for competent job practice.”

Exam development and form creation will begin in the summer 2023 and updated exams will launch in the first quarter of 2024.

For more information about ASHRAE Certification, visit [ashrae.org/certification](http://ashrae.org/certification).




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# ASHRAE Publishes First Zero Energy and Zero Carbon Building Evaluation Standard

ATLANTA — ASHRAE has released a new standard to measure zero net carbon and energy goals in buildings.

ANSI/ASHRAE Standard 228-2023, *Standard Method of Evaluating Zero Net Energy and Zero Net Carbon Building Performance*, sets requirements for evaluating whether a building or group of buildings meets a definition of “zero net energy” or a definition of “zero net carbon” during building operation. The standard draws from ASHRAE Standard 105, among others, to address energy and carbon flows across a site boundary, their measurement, and their balance.

“Achieving a zero-energy building has been viewed by many as a difficult goal to meet, with unforeseeable roadblocks and differing guidance,” said Keith Emerson, P.E., Life Member ASHRAE, chair of the Standards Project Committee 228. Standard 228 provides a consistent method for determining whether new and existing sites have reached zero energy. We hope this standard will become a helpful resource for building professionals in strategic decarbonization planning.”

Additional features of Standard 228 are as follows:

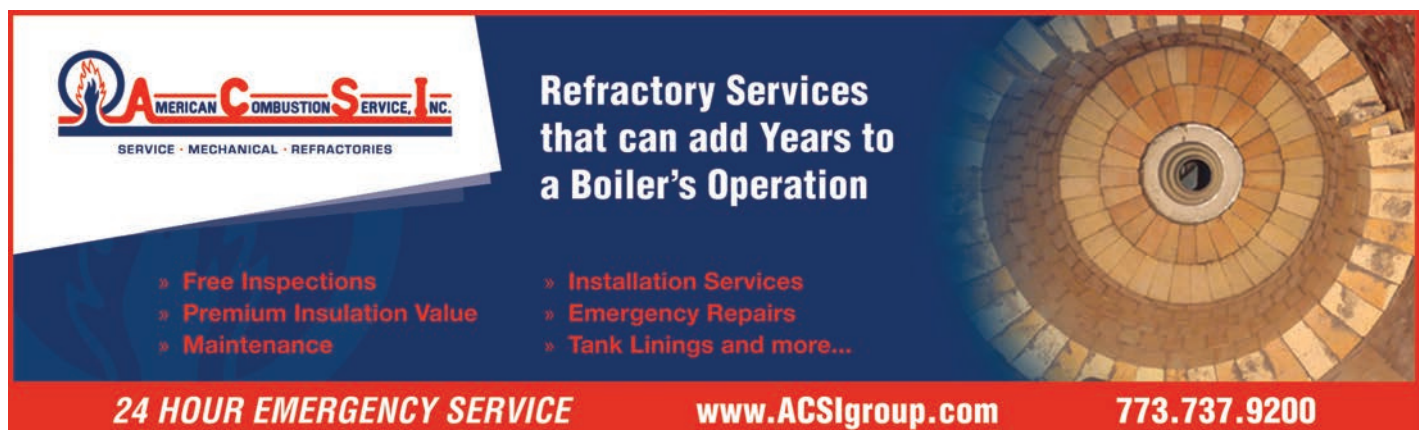
- Allowances for sites that lack the opportunity to produce adequate renewable energy, while placing additional requirements on the use of external carbon and renewable energy in the calculation.

- Defined calculation of energy in terms of *source* — a multiplier on the energy crossing the site boundary to include energy used or lost in extraction, generation and transit to the site.
- The main energy calculation made in terms of annual average factors. Allowance is made for the calculation of individual hours where data is available.

Standard 228 does not apply to the establishment of building energy performance goals or limits; design guidance or design requirements; embodied energy of building materials and systems; and transportation to and from a building. The standard is also not intended to circumvent any safety, health or environmental requirements.

To purchase Standard 228-2023, visit [ashrae.org/228](http://ashrae.org/228) or contact ASHRAE Customer Contact Center at 1-800-527-4723 (United States and Canada), 404-636-8400 (worldwide) or fax 678-539-2129.

Standard 228 has been published on continuous maintenance. A Standing Standard Project Committee (SSPC 228) has been formed to update the standard through the publication of addenda or revisions to any part of the standard. SSPC 228 is chaired by Dr. Paul Torcellini. Instructions for how to submit a change can be found on the ASHRAE website at [ashrae.org/continuous-maintenance](http://ashrae.org/continuous-maintenance).



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# AMERICAN STREET GUIDE

## After Arlington National Cemetery Horse Deaths, Army Makes Changes to Improve Their Care

By Tara Copp | Associated Press

WASHINGTON (AP) — The Army recently announced changes to the way it will care for the gray and black horses that carry service members' flag-draped caskets to their final resting places in Arlington National Cemetery after the deaths of horses in the ceremonial unit exposed their poor living conditions.

The horses are part of the caisson platoon of the 3rd Infantry Regiment, known as the Old Guard, which is best known for guarding the Tomb of the Unknown Soldier at the cemetery, located just across the river from Washington.

Two Old Guard platoon horses, Mickey and Tony, had to be euthanized within days of each other in February 2022. Both died from colon impaction, a "dry, firm mass of feed, or foreign material, such as dirt or sand," and in Tony's case, he had to be euthanized because the sand and gravel impaction was so extensive it could not be surgically removed, according to an Army investigation.

After the deaths of the two horses, both in their 20s, veterinarians found sediment in the manure of other horses, likely because they had so little grass in their turnout fields and consumed sand and gravel from the ground as they ate hay, the investigation found.

Compounding the problem, the hay was so low quality that it could not be easily digested by older horses like Tony as they nosed it around on the ground looking for edible feed. Army veterinarians noted the issue six months before the horses' deaths but did not raise their concerns past the platoon leadership. And the platoon had no way to force the hay supplier to provide higher-quality hay because the Army contract did not specify the nutritional value required.

When the horses did get to graze outdoors, those small turnout fields were also littered with construction debris and manure, and even if they had been in proper condition, would only have been large enough to support six or seven horses, the investigation found. At the time of the horse deaths, the field was used for a herd of 64.

The commanding general of the Military District of Washington, Army Maj. Gen. Allan Pepin, said the conditions were a result of mismanagement, not soldier abuse. Pepin said the conditions reflected a lack of full understanding by Army managers of the horses' needs and the training needed for the soldiers to care for them, and also a lack of resources.

"The platoon took it personal because nobody wanted this outcome," Pepin told reporters May 10. "Every time you went by and saw the missions, we never saw a horse that looked like it was lame. We never saw a horse that looked like it was having issues. What we

saw was expert soldiers and horses that looked great. So it kind of masked the underlying problem."

In the months since, the Army has retired older horses, some as old as 20 that were still part of the group pulling the more than 2,500-pound caissons, which date back to 1918. It has also begun the process of buying new horses, and will no longer purchase gray horses, because they are likelier to develop skin cancer. The unit has also leased additional pasture land and received funding from Congress to improve the stables.

The Army is also working on obtaining a lighter caisson to put less strain on the horses and developing new saddles and other tack to better prevent horse injuries, Pepin said.

Since the euthanizations, the Army has brought on a full-time herd manager and been able to improve the horses' diets, Pepin said, and regular veterinary bloodwork shows they are making progress. However, two additional horses have had to be euthanized since, one due to a leg fracture and one due to intestinal issues.

In early May, the Army decided caisson operations would be suspended for 45 days to give the horses time to recover from any injuries. ☞

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A U.S. Army Caisson team carries the casket of Lt. Col. Richard Smith during his funeral at Arlington National Cemetery in Arlington, Va., March 28, 2019. The Army has announced changes to the way it will care for the gray and black horses that carry service members' flag-draped coffins to their final resting places in Arlington National Cemetery. (AP Photo/Steve Helber, File)

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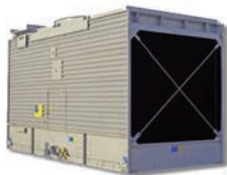
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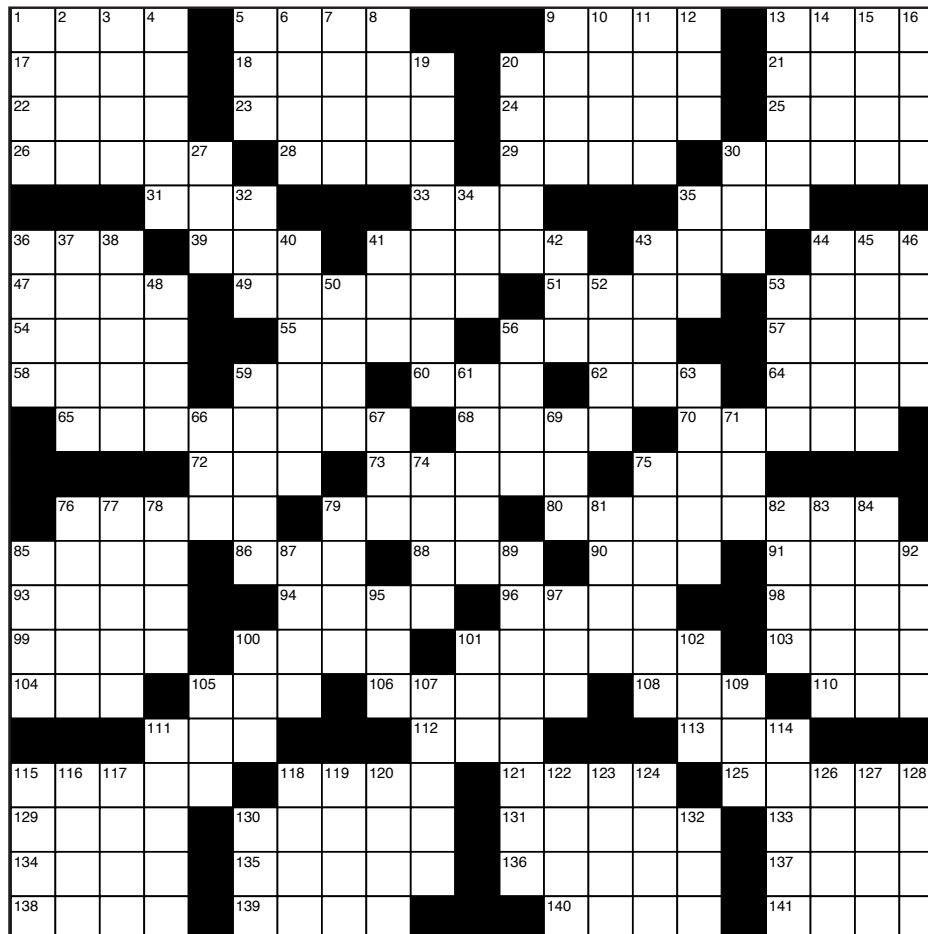
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- 29 Not far
- 30 Religious songs
- 31 Yes
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- 35 VI
- 36 Hades
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- 44 Frolic
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- 135 Concur
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DOWN

- 1 Tel \_\_\_
- 2 Bog down
- 3 Presidents office

- 4 Gritty
- 5 Pacific Time
- 6 Prick
- 7 Part of a sentence
- 8 Plod
- 9 Shield
- 10 Location
- 11 Nurture
- 12 Married woman
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- 14 Short for aluminum
- 15 Holey
- 16 Meets
- 19 Abode
- 20 Sanskrit
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- 30 Lurked
- 32 American Cancer Society (abbr.)
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- 35 Bro.'s sibling
- 36 Platter
- 37 Become libel
- 38 Written music
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- 41 Farming club (abr.)
- 42 Winter mo.
- 43 Elderly
- 44 Romance
- 45 Extreme
- 46 Loch \_\_\_ monster
- 48 Reverent

- 50 Eat
- 52 Metric weight unit
- 53 Vessel
- 56 Lawyer (abbr.)
- 59 Eagle's nest
- 61 Insane
- 63 Sword
- 66 She
- 67 Winter sport
- 69 Klutz
- 71 Kimono sash
- 74 Tails
- 75 Removed
- 76 Actor Paul (of Crocodile Dundee)
- 77 Black
- 78 After eight
- 79 Fogginess
- 81 Object
- 82 Reckless
- 83 Sandwich cookies brand
- 84 Dusk
- 85 Joyful
- 87 Cow noises
- 89 Spurn (2 wds.)
- 92 Predestine
- 95 Electroencephalograph (abbr.)
- 97 Pose
- 100 School group
- 101 Cow's chow
- 102 Back to school mo.



# BOILER ROOM ANNEX

Probabilities at the Pub

Source: [engineering-humour.com/engineering-jokes.html](http://engineering-humour.com/engineering-jokes.html)

Every Friday afternoon, a mathematician goes down to the pub, sits in the second-to-last seat, turns to the last seat, which is empty, and asks a girl who isn't there if he can buy her a drink.

The publican, who is used to weird university types, always shrugs but keeps quiet. But when Valentine's Day arrives, and the mathematician makes a particularly heart-wrenching plea into empty space, curiosity gets the better of the publican, and he says, "I apologize for my stupid questions, but surely you know there is NEVER a woman sitting in that last stool. Why do you persist in asking out empty space?"

The mathematician replies, "Well, according to quantum physics, empty space is never truly empty. Virtual particles come into existence and vanish all the time. You never know when the proper wave function will collapse, and a girl might suddenly appear there."

The publican raises his eyebrows. "Really? Interesting. But couldn't you just ask one of the girls who comes here every Friday if you could buy HER a drink? Never know — she might say yes."

The mathematician laughs. "Yeah, right — how likely is THAT to happen?"

Engineer Q&A

Source: <http://hutnyak.com/Jokes.htm>

Q: What is the definition of an engineer?

A: Someone who solves a problem you didn't know you had in a way you don't understand.

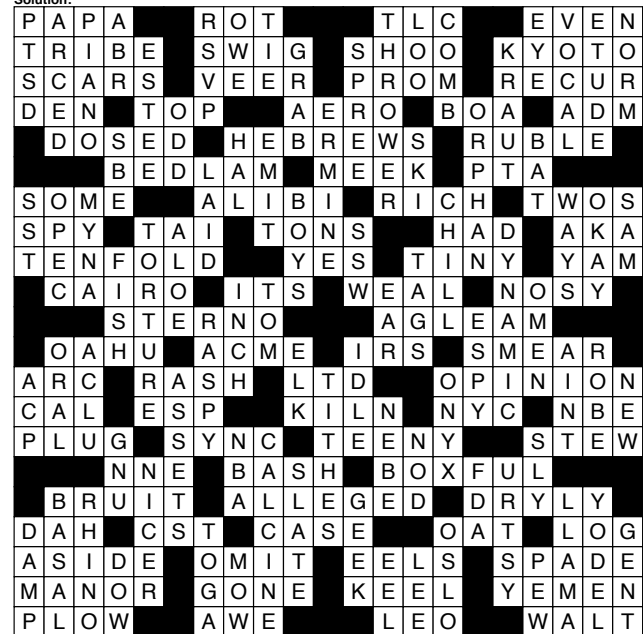
Q: When does a person decide to become an engineer?

A: When he realizes he doesn't have the charisma to be an undertaker.

Q: How can you tell an extroverted engineer?

A: When he talks to you, he looks at your shoes instead of his own.

Solution:



## MAY SOLUTION

Q: Why did the engineers cross the road?

A: Because they looked in the file and that's what they did last year.

Engineering Wisdom

Source: [www.reddit.com](http://www.reddit.com)

Normal people believe that if it isn't broken, don't fix it. Engineers believe that if it isn't broken, it doesn't have enough features yet.

Architects are generalists to some extent, and know a little about a lot of things, and learn less and less about more and more until eventually they know nothing about everything. Engineers, on the other hand, tend to specialize — they learn more and more about less and less until they end up knowing everything about nothing. ☹️

## Wrench



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by Jim McGreal



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