Bell & Gossett
xylem

Accelerating decarbonization

Maximizing energy efficency with advanced HVAC and plumbing system design



Taking a holistic approach

The path to decarbonization is complex and multifaceted as stakeholders in the commercial building sector reimagine how buildings interact with energy systems and their individual approach to innovative solutions.

Today’s decarbonization efforts require a comprehensive strategy that considers system design, maintenance and technological innovation—and the right solution at the right time. It also presents an opportunity to reimagine today’s solutions.

> “A focus on end-to-end solutions that holistically address the built environment will be crucial to effectively address the challenge of decarbonization.”
>
> Jim Nolan, market development manager, Xylem

02
Taking a holistic approach

03
What’s driving innovation today?

09
Embracing advanced pump solutions

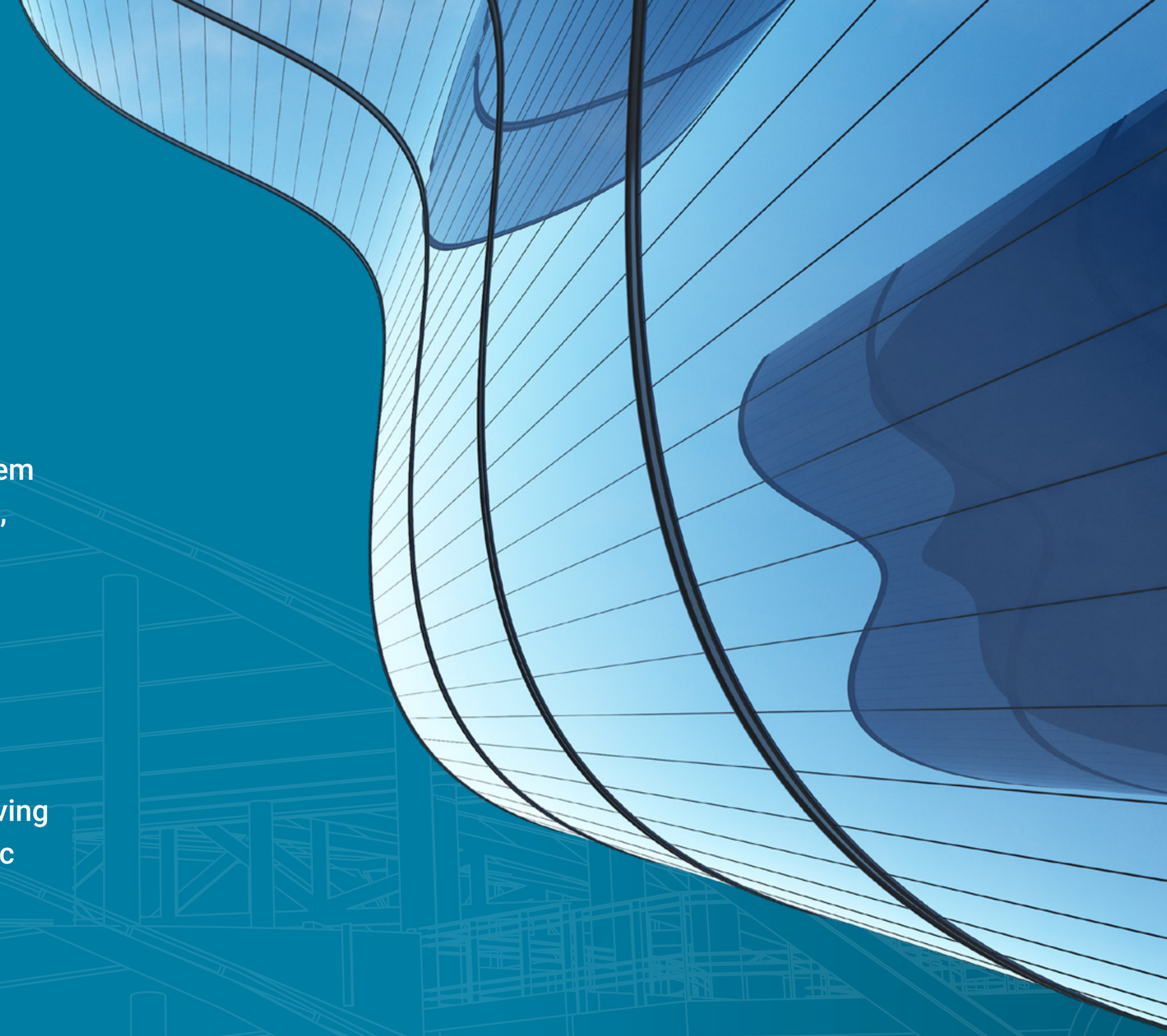
12
The power of collaboration

17
Looking ahead

What’s driving innovation today?

Decarbonization is a major driver in reshaping HVAC system design, pushing the industry to prioritize energy efficiency, electrification and low-carbon technologies. Emerging strategies to reduce building emissions are increasingly focused on practical, scalable solutions that emphasize **sustainability** and **serviceability**.

At the cornerstone of such solutions is innovation—a vital necessity in the face of today’s evolving landscape. Achieving a sustainable, resilient built environment involves a holistic approach encompassing the following five aspects:



1 Regulations and standards accelerating transformation



Government regulations set the bar for energy performance, **encouraging the development of more efficient HVAC systems**. A combination of minimum efficiency standards, technology mandates and financial incentives is motivating the development of innovative HVAC solutions that support broader sustainability goals like the Department of Energy's **E3 initiative**, focused on efficient and clean heating and cooling systems in residential and commercial buildings.

> "Building energy performance standards have gotten the attention of the industry – it's the first time we're seeing CFOs, chief sustainability officers and chief engineers all agree on what needs to be prioritized."
>
> Jim Nolan, market development manager, Xylem

2 New efficiency standard redefines circulator pump industry



The call for **improved sustainability** is resulting in stricter building codes and regulations that mandate higher efficiency standards for HVAC and plumbing equipment. This includes measures like the **DOE's circulator pump efficiency standards**, which require manufacturers to use electronically commutated motors (ECMs) or achieve equivalent performance by May 2028. As part of the Energy Policy and Conservation Act (EPCA), the standard aims to significantly reduce energy consumption and enhance performance.

With new standards like these raising the bar for manufacturer developments, many manufacturers are already producing highly efficient circulator pumps that **exceed DOE's 2028 standards**. For instance, **Bell & Gossett's ecocirc 20-18**, a next-generation variable speed ECM smart circulator, offers industry-leading efficiency with Energy Efficiency Index (EEI) levels at or below 0.18.



3 Preparing for the next wave of commercial buildings

Understanding and **addressing customer pain points** has always been a driving force behind Xylem's solution design. Validating these concerns presents an opportunity to innovate and approach solution design from a different angle.

For instance, Andrew Pratt, president of **FIA**, a Bell & Gossett rep based in Massachusetts, notes that incoming engineers and designers are much more aware and educated about how spaces are conditioned, with heating and cooling and equipment efficiency a key consideration for building design going forward.

> "As the current HVAC workforce starts to retire, it's the younger generation that's really taking this and moving it forward."
>
> Andrew Pratt, president, FIA

Whether it's occupant comfort, reducing operational costs or promoting energy efficiency, market trends and customer needs provide an option to consider modern HVAC systems differently and develop adaptive, future-proof technology that can evolve with changing operating demands.

4 Setting the standard through product innovation



Bell & Gossett sets the standard through **product innovation for performance and reliability**, **actively developing products and solutions** that help commercial buildings meet increasingly stringent emissions and energy performance standards. That includes high-efficiency pump solutions, like **hydrovar X-enabled smart pumps** and e-90E Smart Pumps, that integrate intelligent pumps and controls to optimize system performance, reduce energy consumption and improve overall efficiency. Product innovation also means actively exploring how to adapt new technologies like water-sourced heat pumps (WSHP).

> "People want to move toward energy efficiency. They understand the move will create cost efficiencies, which increases ROI and attracts tenants, employees and investors. But there are significant hurdles for owners and operators—the first of which is the financial investment to move towards energy efficiency, especially when you start talking about retrofits."
>
> Mary Lou Peck, BOMA

5 Choosing the right solution at the right time



Although adaptive reuse—repurposing existing buildings for alternate uses—isn't a new concept, it has **gained interest in recent years as a viable solution** to address the challenges of today's built environment. Essential to this approach is updating HVAC and plumbing systems to align older buildings with **contemporary energy-efficiency standards**. That requires careful assessment of existing equipment to identify components that can be reused and configured into the new system design. Equally important is determining how **smart technology** can be integrated to optimize system performance. Modernizing HVAC systems in adaptive reuse projects with advanced technologies like smart motors and monitoring and controls can boost sustainability efforts, improve efficiencies and increase operational savings.

Access our white paper to learn more about adaptive reuse in the built environment



Embracing advanced pump solutions

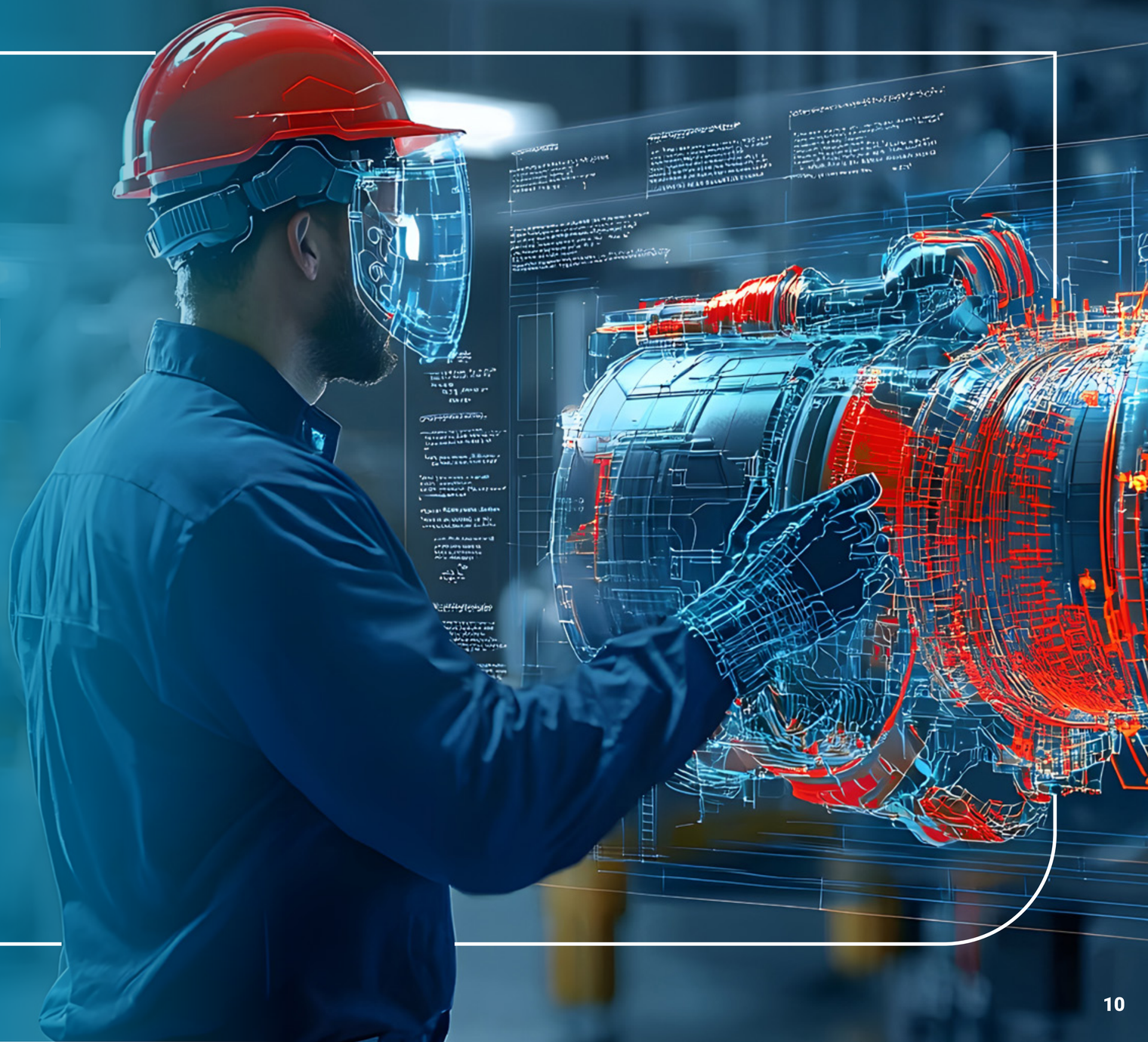
As the market rapidly evolves toward more sustainable practices, the commercial building industry is increasingly focusing on advanced pump design to decrease energy consumption.



“The buildings that are built today will last decades into the future,”

Jacob Lazzarotto, mechanical engineer,
new product development innovation, Xylem.

“Any small amount or percentage of energy usage that you can decrease carries a tremendous amount of weight over the long term.”



Among today's advanced pump designs are smart pump systems that combine pumps, motors and drives into integrated units with built-in application software. These systems are designed to maximize energy savings and serviceability, **directly supporting electrification efforts in building infrastructure**.

Hybrid heat pump systems are another advanced pump solution the built environment is increasingly employing. These dual-fuel systems combine heating sources like water-sourced heat pumps and gas boilers to dynamically adjust based on real-time conditions. The result is more efficient operations, enhanced comfort and continuously optimized performance.







Technology	Efficiency Impact	Decarbonization Benefit
Ultra-premium permanent magnet motors (IE5)	Up to 18% at BEP	Lower electricity and emissions
Electronically Commutated Motors (ECMs)	Up to 30% higher efficiency	Significant for continuous loads
Variable Frequency Drives (VFDs)	25% energy savings	Reduces peak demand, emissions
Integrated motor/drive solutions	Lower system costs by 20-40%	Simplifies system design

The power of collaboration

During Bell & Gossett’s Building Better Futures panel discussion at AHR Expo 2025, participants shared a resounding message:



“The path to net zero is a long journey that will take a lot of work and cooperation.”



Fostering innovation through collaboration

Encouraging adoption of sustainable solutions among manufacturers, engineers and policymakers requires sharing resources and best practices to drive decarbonization strategies:



Integrated design process

It's vital to involve technology partners early in the design process to ensure the equipment that is selected can leverage efficiency and help communities achieve their sustainability goals.



Collaborate on regulation

There's a need for cooperation among industry stakeholders to discuss how policies can either support or hinder efficiency goals, including an open dialogue about building energy performance standards to ensure they are reasonable and achievable.



Future-proofing projects

Collaboration is necessary to address the speed of innovation and to ensure that technology partners are involved in evaluating buildings and planning their life cycles effectively.

These collaborative efforts aim to enhance efficiency, sustainability and the overall effectiveness of initiatives aimed at achieving decarbonization and net-zero goals.

Individual stakeholders’ impact on HVAC system selection

Reimagining today’s solutions requires engaging with a diverse community of building professionals and recognizing the important role they play in solution design at each stage.



Architects

work to ensure the chosen system integrates seamlessly into the building’s design, both functionally and aesthetically.



Manufacturers

are actively investing in research and development to keep pace with emerging regulations and product innovations to meet future building needs.



Design engineers

provide technical expertise to ensure the selected HVAC and plumbing systems meet the specific needs of the building’s design and function.



HVAC and plumbing contractors

stay informed about the latest technologies to help guide system selection to ensure long-term performance.



Building owners and facility managers

prioritize factors like initial costs, operating expenses and occupant comfort during the selection process.

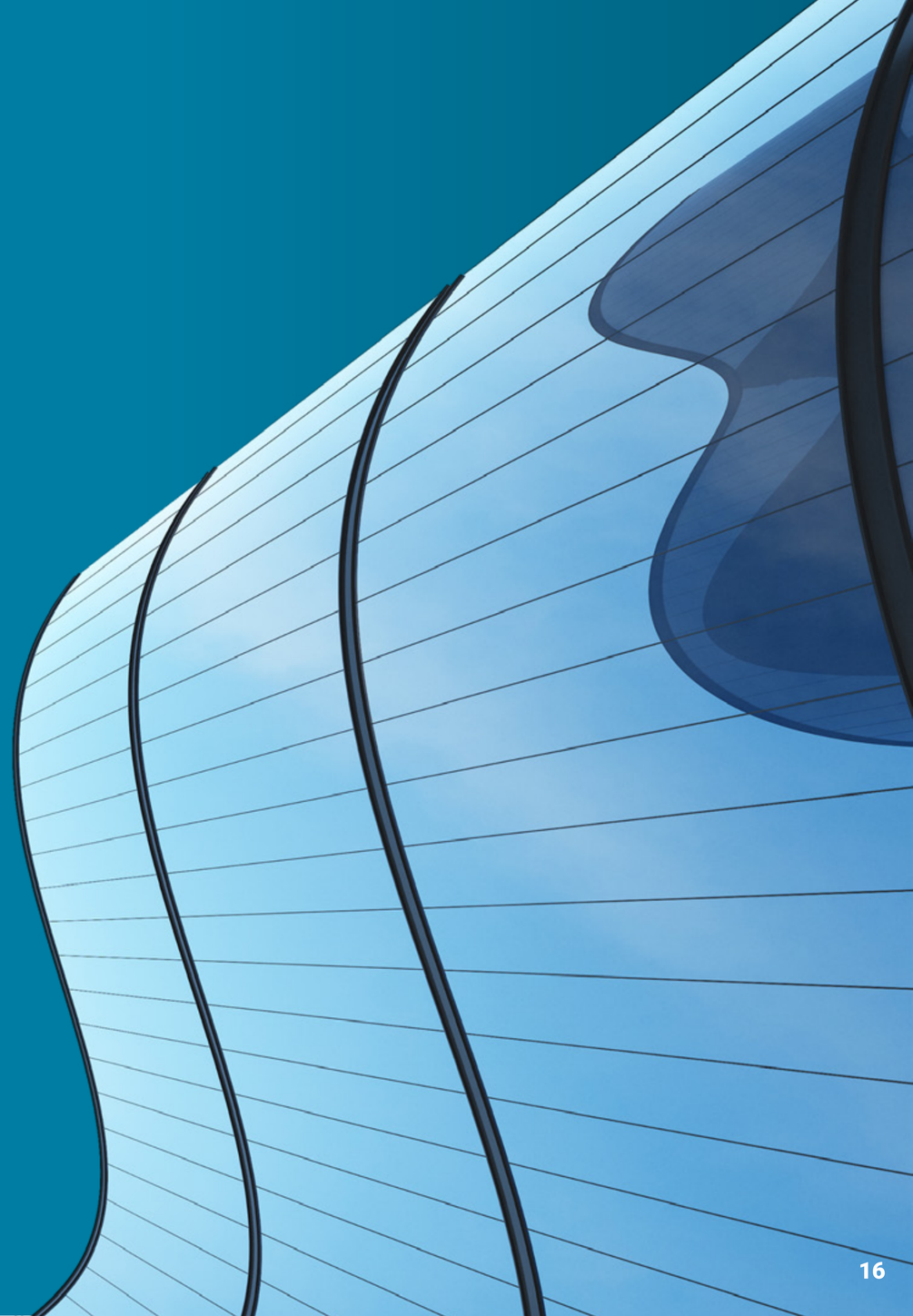


Technical educators

like at Bell & Gossett’s Little Red Schoolhouse empower the next generation of professionals through hands-on instruction and accessible learning formats.

Collaborating with startups to scale innovative water technologies

With the explosive growth of AI driving a sharp rise in water demand from data centers, a startup promoting direct-to-chip cooling is among the 13 emerging companies to join the latest cohort for Xylem's Partnerships Accelerator. Operated by **Xylem Innovation Labs**, the accelerator focuses on helping startups fast-track real-world solutions to optimize aging infrastructure, reduce energy use and keep water flowing.



Looking ahead: The future of solution design

As the HVAC industry continues to evolve, a multifaceted approach is emerging as the foundation for future decarbonization efforts. By integrating water-sourced heat pumps with high-efficiency boilers and exploring additional technologies like thermal energy storage and hydronic cooling, the industry can deliver greater energy efficiency and carbon reductions. This systems-based thinking is key to building resilient, future-ready infrastructure.

Industry players recognize there is no one-size-fits-all solution. Instead, emerging approaches emphasize system upgrades and designs that deliver significant emissions reductions, often through retrofits and smart controls. By embracing innovative approaches like these, the commercial building sector can move toward a more sustainable future where comfort, efficiency and environmental responsibility can coexist.

Learn more about the emerging technologies and solutions Bell & Gossett is prioritizing to advance sustainability and decarbonization efforts in the built environment.

© 2025 Xylem Inc. or its affiliate. All rights reserved. Bell & Gossett is a trademark of Xylem or one of its subsidiaries.

BG-NZeB-VM-3000031 R1

Bell & Gossett
xylem