Everyone is aware of the economic hardship the COVID-19 pandemic has caused for the construction sector and the economy as a whole.

Although the full impact of the pandemic remains largely unknown, one thing seems certain: it will not last forever. Construction will gear back up and may gain a boost from pent-up demand. **Opportunities such as those described here in the commercial building renovation market will ultimately return.**

COMMERCIAL BUILDING RENOVATIONS: THE PAST AND PRESENT COMBINE TO FORGE A BRIGHT FUTURE

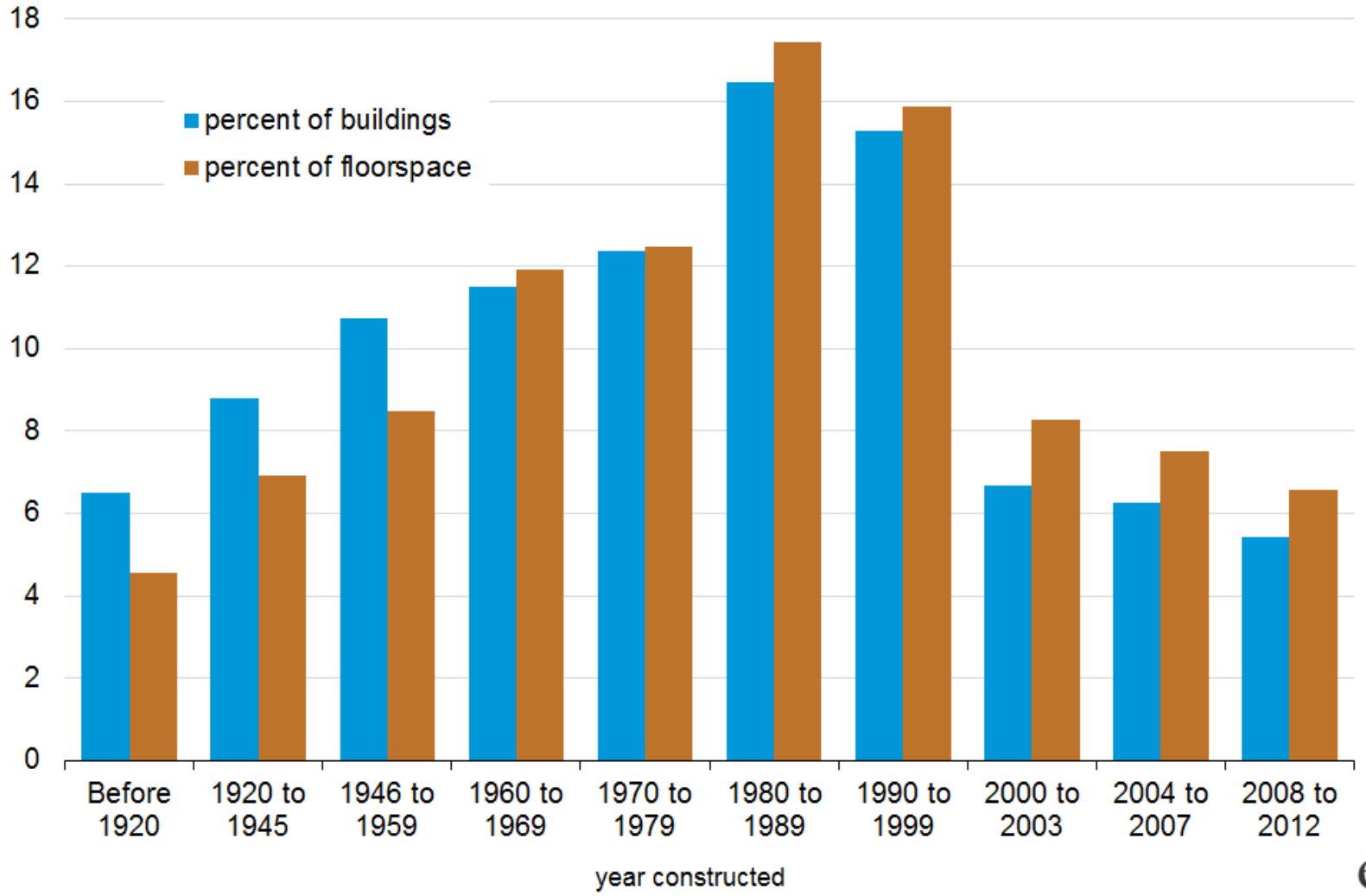
It is often said that numbers don't tell the whole story. In the case of the commercial building renovation and restoration market, however, the numbers tell an important and compelling story.

In the United States, 5.6 million commercial buildings covered 87 billion square feet of floor space in 2012. By 2050, commercial building floor space is expected to reach more than 126 billion square feet.

—University of Michigan Center for Sustainable Systems

Half of all commercial buildings in the U.S. were constructed before 1980; the median age of buildings in 2012 was 32 years.

—CBECS 2012, U.S. Energy Information Administration



Source: U.S. Energy Information Administration, 2012 Commercial Buildings Energy Consumption Survey

An estimated **72 percent of current buildings are more than 20 years old** and were built with little concern for energy savings.

—American Institute of Architects and Rocky Mountain Institute

Fifty-one percent of Americans say they would spend more money on food, products, and rent if that meant living in an environment that set them up for a longer, healthier life.

—Living Standard, U.S. Green Building Council

These numbers highlight the opportunities that exist in building restoration and renovation. And the restoration construction industry is responding: Prior to the 2008 recession, work on existing facilities accounted for about one-third of overall billings. Immediately after the recession this share jumped up to about 45 percent, and the share of activity in existing facilities has remained high post-recession, according to Kermit Baker, Chief Economist, American Institute of Architects.

Overall, commercial building restoration is expected to account for over **$2 trillion (U.S.) by 2024**, according to Global Market Insights. Driving the business is the desire to **REDUCE FIXED COSTS** (particularly utility expenses) and the trend towards transforming the office environment into an **ECO-FRIENDLY SPACE** to improve employee health and well-being—along with the benefit of positive social media marketing that such a transformation is likely to provide.

ENERGY IMPROVEMENT OPPORTUNITIES

According to the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, renovation, retrofit, and refurbishment of existing buildings represents an opportunity to upgrade the energy performance of commercial building assets for their ongoing life, either by improving energy efficiency or decreasing energy demand. Energy-efficiency retrofits can reduce operational costs, particularly in older buildings, as well as help to attract tenants and gain a market edge.

And according to the **BUILDING EFFICIENCY INITIATIVE**, while roughly **2 PERCENT OF COMMERCIAL FLOORSPACE** is newly constructed each year, and a comparable amount renovated, the majority of opportunities to improve efficiency over the next several decades will be in existing building stock, most of which is constrained by old equipment and aging infrastructure.

The University of Michigan Center for Sustainable Systems points out that prior to 2000, little attention was paid to energy use and the environmental impact of buildings during design and construction.

For typical commercial buildings, current standard energy efficiency measures can reduce energy consumption by **20 to 30%** with no significant design alterations.

A WIDE RANGE AND SCOPE

Of course, not all building renovations will be done with the goal of increasing energy efficiency. Depending on the type of building, some renovations are done regularly for aesthetic reasons.

David Corson, Publisher/Editor of *Commercial Construction & Renovation* magazine, noted that commercial renovations can vary widely in range and scope, from a regularly scheduled refreshing to a top-to-bottom reconstruction. Some retailers and restaurants, for example, are on a three- to five-year plan as far as renovating their stores. That may mean new fixtures, carpet, paint, and lighting.

"A retail or restaurant chain may try a new look at several locations, and if sales increase at those locations they'll roll it out across the country."

—David Corson, Publisher/Editor of *Commercial Construction & Renovation* magazine

Of course, a mechanical system renovation isn't going to be necessary every five years. However, that doesn't mean opportunities don't exist for heating and cooling contractors and engineers.

"HVAC units that are properly maintained can last for a long time," Corson said. "But the energy controls and system analytics can be upgraded more often. The people running facilities are very aware of their utility costs and want to know that their units are running as efficiently as possible. If you have 1,000 locations and you can reduce the energy usage at each one just by adding a sensor or control, you're going to do it."

Ultimately, Corson said, commercial property owners are looking for four things in the retrofit/ renovation market.

"They want their facilities to be architecturally stimulating, sustainable, low-maintenance and energy-efficient," he said. "And they will look for an HVAC or energy company they can work with to help them achieve those goals."

ENTICING AMENITIES

A trend to follow in the commercial retrofit/renovation market is the growth of "resimercial" design, said Christina Koch, Editor-in-Chief of *Retrofit* magazine. This means buildings are more frequently including residential- and hospitality-inspired amenities to entice the best and brightest to the workplace and, ultimately, keep them there.

"Tenants today have higher expectations about their workplaces and want to be able to access retail, fitness, and social offerings, which has driven more mixed-use facilities," Koch said.

Although return on investment will always be foremost in building owners' minds when it comes to existing building renovations, Koch said she also is seeing an increase in owners looking to create unique spaces that will draw tenants and/or attract customers by telling a unique story of the history of the building.

"We're sharing more projects in which the design team is uncovering and embracing the original architecture of the building, letting it guide them toward the final design for the building's new use," she said.

In addition, building teams are increasingly using 3D scans to determine existing conditions of historic buildings, as well as turning to virtual reality to coordinate the installation of complex, modern mechanical systems into existing spaces.

"Those tools can save the team weeks in the field reacting to the existing conditions of the building," Koch noted.

HISTORICALLY A STRONG MARKET

Steve Bachman, President of the Retail Contractors Association (RCA), said that the association's 80-plus member companies historically perform about **75% OF THEIR WORK IN EXISTING BUILDINGS VS. NEW CONSTRUCTION.**

Bachman noted that RCA member companies perform work regionally, nationally, and internationally.
Trends he and his members are seeing include the near-universal adoption of Building Information Modeling (BIM) technology and a focus on installation speed by employing prefabrication and modular construction.

"We typically do mostly renovation of existing properties and remodeling activity," he said. "However, during the COVID-19 era the most active construction primarily has been new, free-standing facilities. We will see what the new normal is once we get past this challenge."

PIPING OPPORTUNITIES

Renovations of older buildings often present opportunities for (or the necessity of) a piping replacement. Copper and steel piping systems, the traditional materials of choice for heating, cooling, potable water, and many industrial applications, can be susceptible to several types of corrosion.

"From the perspective of metallic piping systems, systems installed in the 1990s are middle-aged, and piping installed in the 1970s or 1980s is already old," said Lance MacNevin, P.Eng., Director of Engineering for the Plastics Pipe Institute.

"The pipe in those buildings is typically at its expected life span and needs to be replaced before leaks occur, leading to expensive water damage and other issues."

MacNevin noted that thermoplastic piping systems such as polypropylene are an excellent choice for retrofitting into existing buildings. For starters, polypropylene pipe is much lighter than metal pipe—up to **70% LIGHTER THAN STEEL PIPE**, depending on the size and wall thickness of the pipe—and is easier to handle in existing spaces.

"As we know, when these buildings were built, the piping was put in before the walls were put up, and then the pipe chases were built around the pipes," MacNevin said. "In retrofits, the lighter weight of polypropylene pipe means installers can easily move and position the pipe to fit into existing chases, usually without the use of lifts or other heavy equipment."

Ryan Pepper, Piping Project Manager, T.H. Martin Inc., Brooklyn, OH, noted the light weight of polypropylene pipe is a huge benefit to his crew.

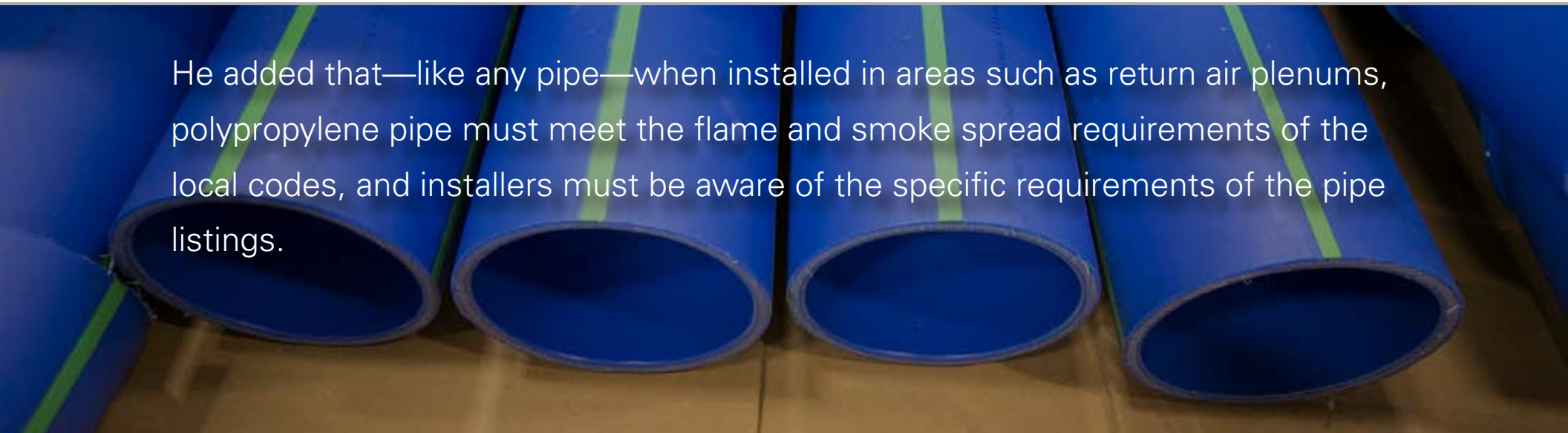
"You're not moving stuff as heavy so the guys can be more productive all day long," he said.

Shaun Swaney, pipefitter, Local 120 Pipefitters Union, Independence, OH, agreed.

"It's a lot easier on your body," he said. "It makes it an easier day, and you're not exhausted at the end of it."

In addition, the ability to prefabricate polypropylene pipe offers a huge advantage in time- and labor-savings over metal pipe. For example, risers can be custom fabricated for the existing space with all the tees already in place. As MacNevin notes, "For every tee you can prefabricate on the workbench, that's three joints that you don't have do in a confined space."

Using polypropylene pipe also eliminates the hazards of welding and the expense of fire watch. **POLYPROPYLENE PIPE IS JOINED USING FLAMELESS HEAT FUSION**, which greatly reduces the risk of fires. "Anytime you can avoid putting fire into an existing building it's a safer day," MacNevin said.

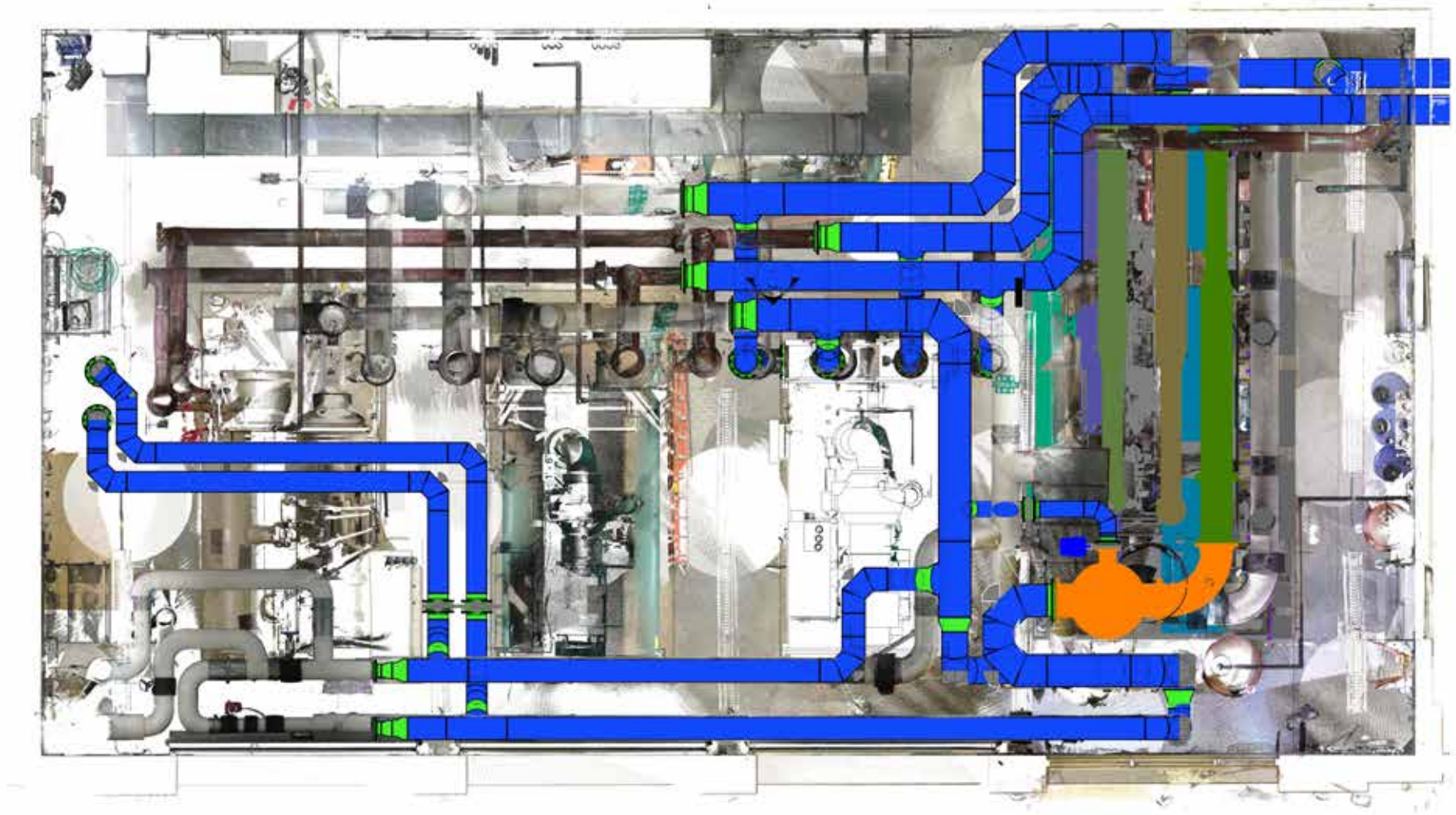


He added that—like any pipe—when installed in areas such as return air plenums, polypropylene pipe must meet the flame and smoke spread requirements of the local codes, and installers must be aware of the specific requirements of the pipe listings.

MAKING THE RIGHT CHOICE

Ultimately, MacNevin said, polypropylene pipes offer building owners peace of mind that they are not going to suffer the same fate as the metal pipes that were installed originally.

"On the plumbing side, polypropylene pipes are not going to suffer from tuberculation and corrosion, and on the hydronics side they're **NOT GOING TO SUFFER FROM EROSION CORROSION,**" he said. "When you prevent those sources of piping system leaks and failures by installing polypropylene pipe instead of metal pipe, the potential property damage that can be avoided is incalculable."



When choosing a polypropylene pipe supplier, be aware that polypropylene pipe manufacturer Aquatherm, the leader in polypropylene pipe systems worldwide, provides complete start-to-finish support, including a 3D Scan-to-Fab service that ensures accuracy or measurements down to 1/8 -in., Fabrication Services, and training to ensure the success of any commercial retrofit and renovation project.

The commercial building renovation market is huge and growing every day. Whereas new building construction once garnered most of the attention, an increasing number of high-profile renovations are combining the best of the past and the present. Using renovation-friendly products such as Aquatherm polypropylene pipe can help renovated buildings have a bright future, too.

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we've got a pipe for that