

LEGISLATION AND ECONOMIC INCENTIVES DRIVE HYDRONIC SOLUTIONS

xylem
Let's Solve Water

MEETING GROWING REGULATORY AND ENVIRONMENTAL PRESSURES



The Flats at City Modern
Detroit
Bell & Gossett rep:
RL Deppmann

The \$100 million City Modern development is the largest residential project in Detroit in 30 years. R.L. Deppmann provided Bell & Gossett 2WF submersible sewage pumps to meet ASME/ANSI code for elevators with fire protection systems that require a means of removing water from the pit below the elevator. The B&G 2WF is capable of removing water at capacities up to 185 GPM.

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INTRODUCTION:

THE KEY TO A GREENER FUTURE

In the United States, direct combustion of fossil fuels accounts for at least **34%** of all energy used in commercial buildings.

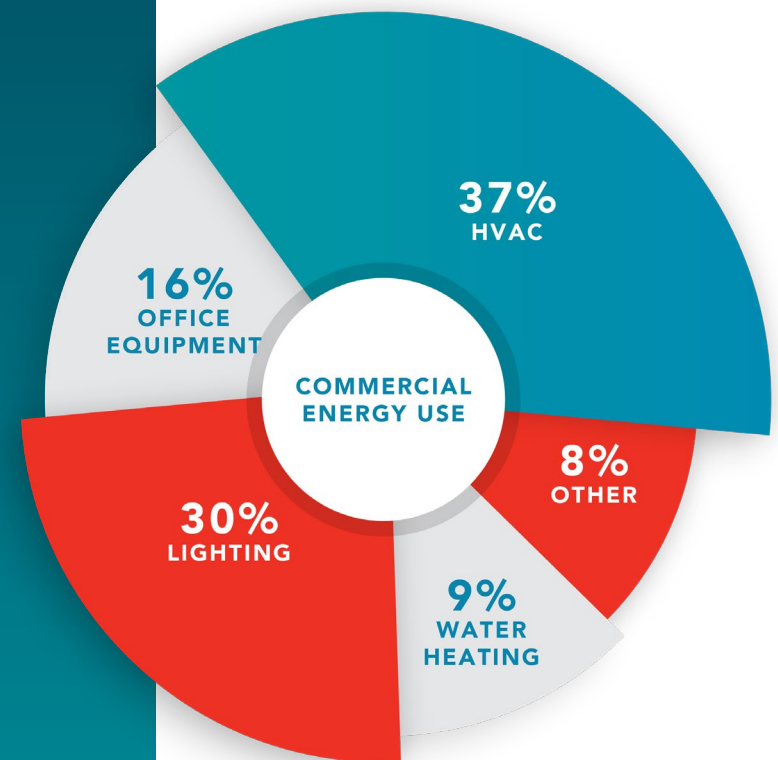
As the demand for energy reduction and reduced environmental impact extends to large commercial structures, decarbonization is widely recognized as the primary solution to ensuring a more sustainable future.

With HVAC systems accounting for 37% of the energy used in commercial buildings in the U.S., HVAC system selection is an important component in decarbonization efforts for new construction and retrofit projects to keep costs in line and realize energy-efficiency targets.

When it comes to shrinking a building's carbon footprint and maximizing return on investment, hydronic systems provide the most efficient and sustainable HVAC solution. Based on tried-and-true principles with more than a century of success, hydronics is a demonstrated heating and cooling solution. What's more, as the commercial building sector navigates decarbonization, modern hydronics presents a viable solution to reduce HVAC systems' negative impact on the environment and promote renewable energy sources.

DEFINING NET ZERO

Put simply, net zero means **consuming only as much energy as produced**, achieving a sustainable balance between water availability and demand, and eliminating solid waste sent to landfills.

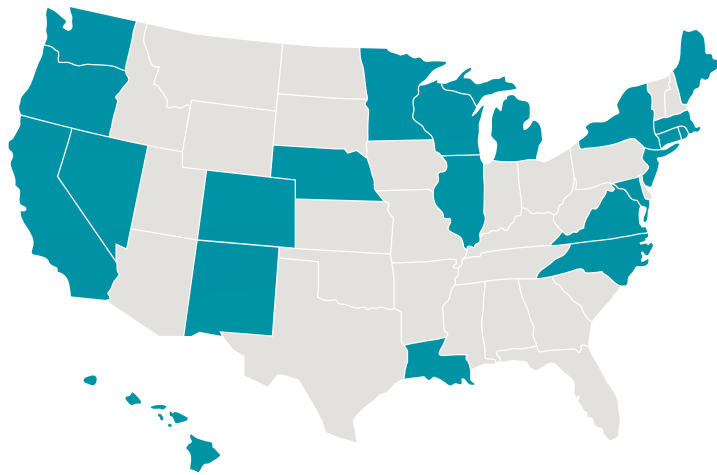


Source: Bell & Gossett Hydronics for Decarbonization case study

LEGISLATION SPURRING CHANGE

In recent years, tighter regulations and policy reform have accelerated decarbonization efforts to achieve net zero carbon emissions in commercial buildings. Amid growing climate change concerns, along with lower costs and improved performance of renewable energy technology, many states are adopting clean energy programs and provisions.

The actions taken by states play a vital role in laying the groundwork for broader action in the push to reduce greenhouse gas emissions and develop clean energy resources. Demonstrating these efforts, [22 states](#), along with the District of Columbia and Puerto Rico, have set 100% clean energy goals, and 11 states have legislation requiring 100% clean or renewable energy with target years ranging from 2032 to 2050.



Beyond local and state directives, federal legislation like the [2022 Inflation Reduction Act](#) is **focused on cutting GHG emissions by about 1 billion metric tons by 2030, driving down carbon emissions by 42% from 2005 levels.** The Inflation Reduction Act (IRA) represents the most significant climate legislation in U.S. history, with funding, programs and incentives to fast-track the transition to a clean energy economy.

HYDRONICS POWERING ULTRA-EFFICIENT ENERGY LAB

By modifying its hydronic system, the Energy Systems Integration Facility (ESIF) on the [National Renewable Energy Laboratory](#) campus in Golden, Colorado, realized aggressive performance goals, including LEED platinum certification (which is 50% higher than ASHRAE 90.1 standards) and a power-use effectiveness (PUE) of 1.06, significantly lower than the industry average of 1.7 to 1.8. The modified hydronic system is comprised of more than 50 Bell & Gossett products, including e-1510 centrifugal, Series 90, Series 80 and Series 60 pumps, and GPX plate and frame heat exchangers. Leveraging the unique waterside economization - or free cooling - capability of the hydronic system means that no refrigerant-based chillers or gas/electric boilers were needed, saving significant energy costs and reducing carbon emissions.

HVAC'S ROLE IN NET ZERO BUILDINGS

Superior HVAC design solutions are key to turning buildings into energy efficient or net zero structures:

- **EMPLOY SMART TECHNOLOGY**

Smart HVAC uses sensors that integrate with a building automation system to collect and monitor information about conditions throughout the building.

- **REGULATE TEMPERATURE**

To accompany smart systems, equipment such as smart thermostats can be installed to maximize HVAC efficiency.

- **INSTALL WATER HEAT PUMPS**

Water-to-water or water-to-air heat pump systems are the most energy-efficient HVAC systems currently available. The pumps only use energy to move the heat through the pipes, lowering a building's potential carbon emissions.

ECONOMIC INCENTIVES

ENCOURAGE PROGRESS

Legislation like the IRA also includes financial incentives to hasten the reduction of GHG emissions. Specifically, the act expands the existing 179D tax deduction to help commercial building owners lower their Energy Use Intensity (EUI) and invest in green technology. Projects with an EUI 25% better than the current ASHRAE 90.1 baseline can deduct \$2.50 per square foot. The amount increases with further EUI decreases, capping out at \$5 per square foot for a 50% EUI improvement. The expanded 179D tax deduction also incentivizes the sustainable redevelopment of existing buildings.

Along with the 179D tax deduction, the IRA extends the existing Energy Investment Tax Credit. Building owners can receive a tax credit for up to 30% of investment in qualifying renewable energy properties like geothermal heat pumps.



Ritz Carlton Residences
Miami
Bell & Gossett rep:
George A. Israel Co.

MEETING EVOLVING HVAC DEMANDS

As new legislation, tighter regulations and policy reform takes hold, key stakeholders in the commercial building sector are embracing modern hydronic system technology to advance sustainability and decarbonization goals.



Google East Coast Headquarters
Manhattan
Bell & Gossett rep:
Wallace Eannace Associates

SUSTAINABILITY

Reducing wasted HVAC energy consumption is an important element in the push for greater sustainability in the commercial building sector. It is also a solution to significantly reduce operating costs.

DECARBONIZATION

As states develop energy plans around decarbonization, moving away from fossil fuels toward electrification, existing hydronic systems offer the flexibility and versatility to convert to more sustainable solutions like heat pumps while taking advantage of existing equipment. This future-proofed flexibility is extremely vital in meeting the decarbonization pressures of today, while also being adaptable to changing standards and technology.

THERMAL STORAGE

Hydronic systems enable thermal storage to allow the production of heated or chilled water when it is least expensive. The resulting energy is stored and later used when demand is highest or for supplemental heating or cooling to be generated through sustainable means.

INCREASED DEMAND FOR HEALTHY BUILDINGS

Indoor air quality can have a big impact on people's health. Unlike traditional HVAC systems, hydronic radiant heating systems promote safer air quality, using pumps to move water, which has a global warming potential (GWP) value of 0. Conversely, some HVAC refrigerants have a GWP value of 2,000 or more.



Willis Tower

Chicago
Bell & Gossett rep:
Bornquist Inc.

A \$500 million makeover of the iconic Willis Tower included extensive retrofitting of its hydronic HVAC system to dramatically improve energy conservation. Along with Bell & Gossett VSX, e-1510, e-80 and e-90 series pumps, Series PL booster pumps help keep water flowing from the new street-level Catalog addition to the observation deck on the 103rd floor all the way to the 108th floor at the top of the tower.

CONCLUSION:

POSITIONED FOR GROWTH

Hydronics are applicable in a wide variety of commercial building applications. In structures like health care facilities, higher education institutions and multifamily buildings where the level of heating and cooling is unbalanced due to the number of stories and occupants, and the challenges for optimizing heating and cooling system performance vary, hydronic systems are a high-efficiency system of choice. For instance, radiant heating and cooling systems use a fraction of the energy of a forced-air system.

Hydronics are also an extremely fast growing system of choice. Driven by the growing need for energy-efficient cooling and heating systems and an increase in construction activities worldwide, the global hydronic systems market is poised to grow \$1.3 billion between 2022 and 2027, according to [Research and Markets](#).

Bell & Gossett, through its unmatched application expertise in the hydronics market and industry-leading experience, is advancing hydronic solutions to achieve sustainability and decarbonization in cities across North America. Learn more in a recent white paper co-authored by Alan Jones, senior director of product management, and Mike Licastro, training and education manager for commercial building services and the Little Red Schoolhouse.

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