

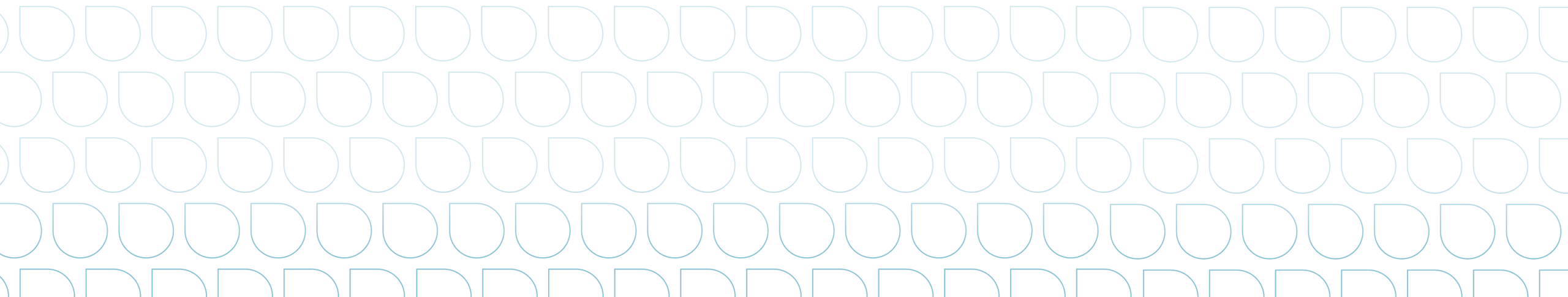


ANALYZING ADAPTIVE REUSE OF HYDRONIC SYSTEM COMPONENTS FOR DECARBONIZATION

JIM NOLAN

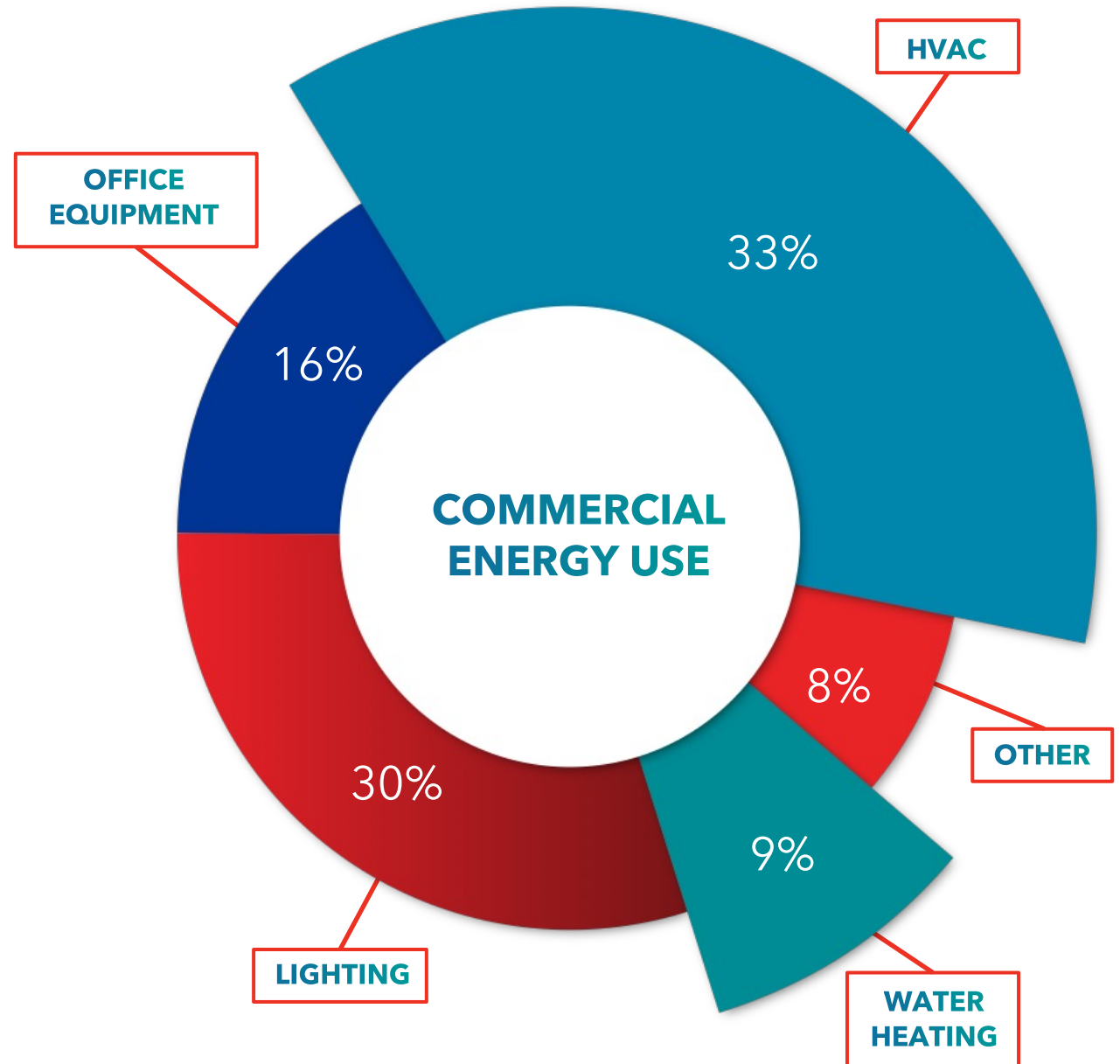
MARKET DEVELOPMENT MANAGER

Bell & Gossett, a Xylem company



THE DECARB CHALLENGE

- Commercial buildings emit **16%** of CO₂ emissions in the U.S.
- To effectively address the challenge of decarbonization, we need to holistically address the built environment
- Roughly **80%** of buildings targeted for decarbonization will be existing, some a result of adaptive reuse plans
- Most existing buildings will be at least 10-15 years old, providing the most immediate opportunity to address decarbonization



SUSTAINABILITY

Making decisions and acting in the interest of protecting the natural world, with particular emphasis on preserving the environment's capability to support human life.



DECARBONIZATION

Reducing the amount of carbon dioxide occurring as a result of power generation and consumption.



ELECTRIFICATION

Replacing technologies that use fossil fuels with alternative technologies that run on electricity ideally generated from renewable resources.



IMPACT OF DECARBONIZATION

ON HVAC AND PLUMBING MARKETS

- Decarbonization is going to happen in phases, not overnight
- It will take years for the infrastructure to sustainably deliver the electricity to impact carbonization
- In all areas, regardless of natural gas bans, competing technologies are preferred at the moment:
 - VRF
 - Heat pump



HYDRONIC SYSTEMS ARE THE MOST EFFICIENT DESIGN CHOICE

- More flexible
- Adaptable to new technology
- Leverages existing reliable technology
- Thermal storage capabilities



OPPORTUNITIES FOR DECARBONIZATION

- Significant incentives in play for sustainable technologies.
- Geothermal, heat pumps, wind, solar and thermal storage all support the expansion of hydronic systems.
- Conversion to electric boilers allows customers to leverage existing hydronic infrastructure.
- Conversion to renewable energy resources will stimulate more central plant renovations.
- Thermal storage will represent significant opportunities.
- Even with new technologies, water-based systems are still the best option:



- Water-sourced heat pumps
- Geothermal
- Water-sourced VRF

PROPERTY TYPE	BASE CREDIT RATE	BONUS CREDIT RATE
Solar energy, geothermal, fiber-optic solar, fuel cell, microturbine, small wind offshore wind, combined heat and power, and waste energy recovery	6%	30%
Geothermal heat pump ¹⁰	6%	30%
Microturbine	2%	10%
Energy storage technology, biogas property, microgrid controllers, dynamic glass, linear generators ¹¹	6%	30%

THE “HYDRONIC” ADVANTAGE



WATER IS A BATTERY!

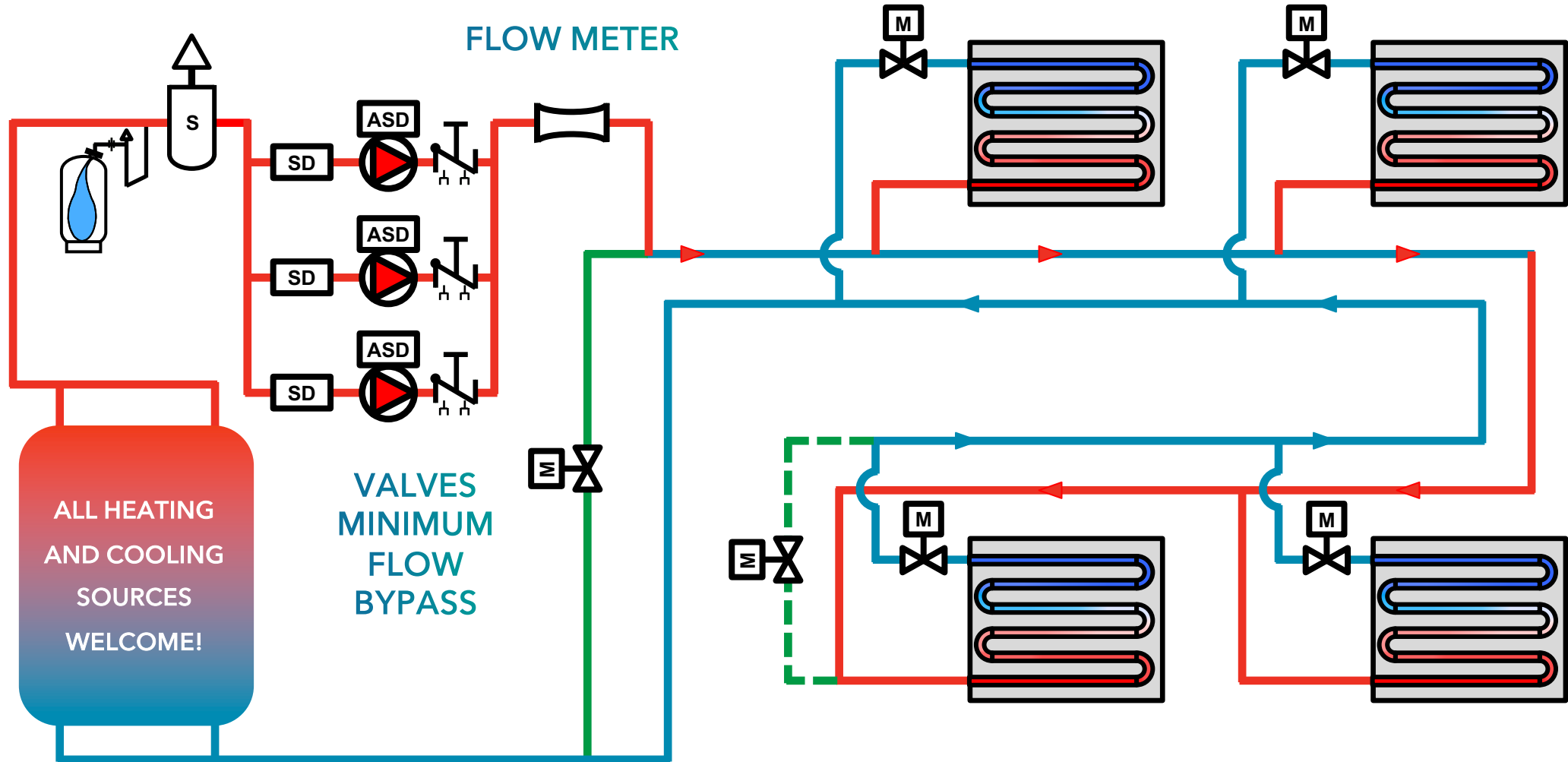
- Leverage existing investment using water with a GWP of zero vs refrigerants.
- Most existing buildings over 3 floors will have a hydronic heating & cooling system.
- Hydronic systems easily integrate with a wide variety of heating and cooling sources

HYDRONIC SYSTEM

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HYDRONIC SYSTEMS

READY TO DELIVER THE BTUs



THANK YOU

