

# Report: Retrofitting Office Buildings Could Cut Their Carbon Emissions by 70%

Digital upgrades, electrification of HVAC systems key to decarbonization strategy

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More than 70 countries have a net-zero target. And according to new research from Schneider Electric, it all starts with a digital-first approach to building management – with particular focus on HVAC in commercial buildings.

The research, carried out with the global design firm WSP, is based on modeling the energy performance and carbon emissions of a large office building built in the early 2000s across various U.S. climate zones.

“The results showed that digital solutions should be prioritized first, as they are faster to implement, lower in upfront carbon, and more effective from a long-term lifecycle carbon perspective,” the company reported. “While full envelope retrofits and building systems upgrades are necessary to achieve full building decarbonization, updating an old building management system (BMS) is the most effective first step.”

Following are a few key data points from the report – which suggest a big uptick in work for commercial HVAC contractors over the next 25 years.

37%

Global carbon emissions attributed to buildings. Of those, 30% are embodied carbon, or CO<sub>2</sub> emissions associated with the construction process of a building, including materials and transport. The other 70% are operational carbon, or emissions produced by the building in use, including from lighting, heating, and energy.

2050

“At the current pace of change, the world will fail to limit global warming to 1.5°C by 2050,” the study wrote. “To meet our global targets, operational emissions caused by building energy consumption must reduce by 5% annually between now and 2050.”

1 in 2

Existing buildings likely to still be in use in 2050 – meaning that the current building stock must be included as part of a comprehensive decarbonization strategy.

“To tackle the climate crisis, we must decarbonize our buildings. Retrofitting is part of the solution.”  
- Schneider Electric

70%

Retrofitting office buildings could slash their carbon emissions by up to 70%.

Researchers at Schneider Electric say that installing digitized building and power management systems in existing office buildings could reduce their operational carbon emissions by up to 42% with a payback period of less than three years.

42%

(Net-)Zero

Replacing fossil fuel-powered heating technologies with electric-powered alternatives that use local renewable energy sources could bring down a building’s carbon emissions by an additional 28%, for a total reduction of 70%.

28%

“Tackling operational emissions is the No. 1 lever to decarbonize existing buildings at scale and achieve net-zero emissions targets by 2050. Reducing carbon emissions by up to 70% is feasible if we transform our existing building stock into energy-efficient, fully-electrified, and digitized assets.”

- Mike Kazmierczak, vice president of the Digital Energy Decarbonization Office, the team leading science-based research and product innovation to accelerate the energy transition within Schneider Electric’s Digital Energy division

Schneider outlines a three-step process – strategize, digitize, decarbonize – to accelerate the path to net-zero buildings.

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#### Strategize

Create a decarbonization roadmap

#### Digitize

Track embodied carbon; measure and monitor energy and carbon

#### Decarbonize

Reduce energy and carbon through automation

Purchase offsite renewables

Electrify transportation

Upgrade building systems and electrical

Install onsite renewables infrastructure

Limit embodied carbon

Offset residual carbon emissions

5.9 million

Number of commercial buildings in the U.S., according to an estimate from the U.S. Energy Information Administration. Meanwhile, our country has 145,142 HVAC contractors, according to IBISWorld.

Not all of those are commercial contractors, and chances are not all of the buildings will be retrofitted; still, the rough math works out to 20 building retrofits per company over the next 25 years, if Schneider Electric’s suggestions bear out.