

15 ways to reduce energy bills while optimizing for indoor air quality

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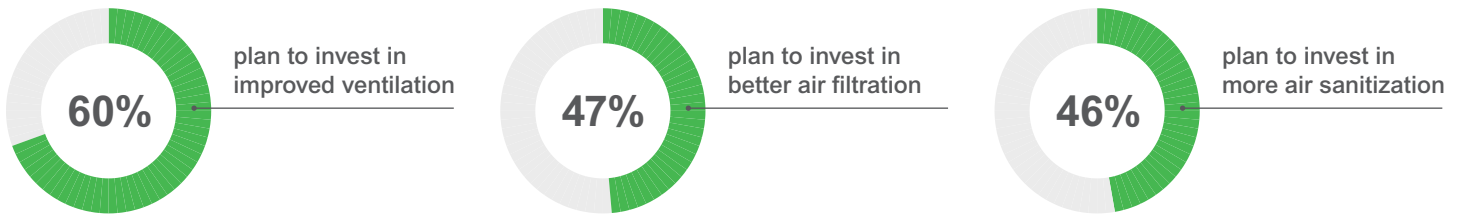
Life Is On

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Change is in the air

The commercial buildings industry is **gearing up for a post-vaccine return** to occupancy. Although it may seem like a return to business as usual, at least one pandemic-era change will stick around: The idea that **indoor air quality (IAQ) matters**.

In fact, **80%** of recently surveyed commercial real estate companies expect healthy building initiatives to shape their strategies over the next three years.¹ Here are more of their investment intentions:



The pivot to healthy buildings isn't just about attracting tenants back to the office in the short term. It's about optimizing the building for all kinds of long-term goals.

43% of survey respondents find healthy buildings easier to lease²

56% of survey respondents say that healthy buildings help them attract and retain quality tenants³

5% productivity gains from enhanced ventilation and thermal comfort⁴



What's the catch?

Optimizing buildings for better IAQ will require HVAC systems to work harder and use more energy. To prevent this from leading to higher energy bills, you'll have to make sure you're optimizing for energy efficiency.



3-6 air changes per hour recommended to inhibit virus spread, depending on the code⁵

2x increase in chilled water energy use to go from 20% to 90% outside air⁶

¹ Source of this statistics and the three that follow can be found in a National Real Estate Investor and Schneider Electric infographic [here](#).

² [IDC and Schneider Electric, 2020](#)

³ [IDC and Schneider Electric, 2020](#)

⁴ [JLL, 2016](#)

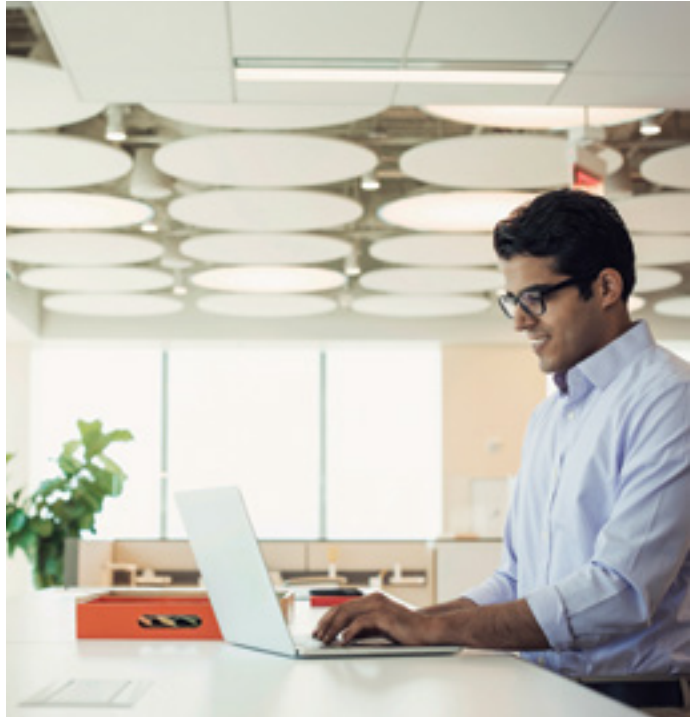
⁵ Minimum of three per hour recommended by ASHRAE Standard 62.1. Six per hour recommended as the "ideal" by [Joseph Allen, Director of Harvard's Healthy Building Program](#).

⁶ Numbers based on recommendations in [ASHRAE Epidemic Task Force Building Readiness Guide 10-20-20](#)

15 energy-efficiency tips to use in your facility

This **15-step checklist** is ideal for building owners who do not have full-time, on-site facility management support or those that have limited resources. Use this list to evaluate your building(s) or to start a conversation with your partners.

The list starts with the simpler, lower cost energy conservation measures and concludes with higher-cost yet higher-reward strategies. Remember new financing opportunities from **stimulus legislation** have made facility upgrades to commercial buildings much more cost effective.



The quick wins

- 1 → Double check your setpoints**
During low-occupancy periods of the pandemic, [many commercial buildings saved energy](#) by pushing setpoints outside of typical ranges. That doesn't need to end in a post-vaccine world. As spaces get reconfigured for re-occupancy, there may be areas that could be kept at a more energy-conscious range.
- 2 → Set up setbacks at night and on weekends**
Pushing setpoints outside of typical ranges on nights and weekends, especially during extreme heat or cold, can save 8 – 10% on energy costs while still protecting the building. In our experience, you can often achieve more efficiency simply by pushing setpoints to the limits allowed by code.
- 3 → Switch to occupancy-based control**
A simple efficiency fix is to install [occupancy sensors](#) that turn lights on or off depending on when occupants are in the room. But there's more you can do. Occupancy sensors that connect to building management systems (BMSs) can also count the number of people in a space, not only to trigger proper lighting or alerts of overcrowding, but also to trigger a targeted ventilation increase.
- 4 → Lock out simultaneous heating and cooling**
HVAC systems sometimes fight themselves; they'll run AC during the winter and heat during the summer. One possible technical reason may be poor system calibration, but the short story is that you can prevent this waste. Enable lock out controls that prevent simultaneous heating and cooling. And don't forget economizer systems — especially useful for better IAQ — that may also need to be locked out when mechanical heating and cooling are running.
- 5 → Optimize start / stop**
You can unlock efficiency gains by starting up your mechanical systems a bit later or shutting down a bit earlier. It's not as simple as asking the question, "When does the first occupant arrive, or the last occupant leave?" For example, a school may stop heating 30 minutes before an evening PTA meeting ends and thereby "coast" toward better efficiency. Modern BMSs can help you automate and model these scheduling tweaks. But remember: Keep fans running to meet required air changes for safety reasons.
- 6 → Switch to variable frequency drives (VFDs)**
Although upgrading to [VFDs](#) may be a more intermediate cost, the ROI is usually less than two years. Why is the payback so good? VFDs control pumps and fans by precisely aligning their output to their required loads, which avoids wasted energy. We've found that reducing fan speed by 20% can cut energy consumption by 50% — an outsized impact.
- 7 → 7. Implement retro-commissioning**
As buildings age, they can fall out of their original design parameters. Retro-commissioning involves analyzing your [BMS'](#) control sequence to see whether any overrides are detracting from your building's original design intent. You can also deploy software for continuous commissioning, which provides daily status updates and ongoing fault detection, including outside air damper issues.

The medium-sized opportunities

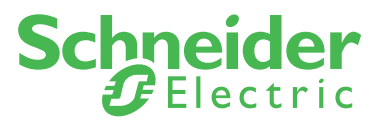
- 8** → **Opt for advanced lighting control**
There's more you can do to optimize lighting energy use. Modern BMSs can add intelligent automation to lighting control, incorporating both occupancy and time-of-day factors into the controls. Real-time dimming based on ambient outdoor light levels, shade controls, and time of day can also be a [significant energy saver](#).
- 9** → **Embrace advanced occupant-based control**
Simple occupancy sensors are just the beginning. It's becoming increasingly common to connect HVAC systems to other building systems, such as access controls, security, and even [space efficiency and occupant engagement apps](#). This last integration enables hyper-granular optimization of each room's temperature and lighting based on the day's unique meeting schedule. Plus, it prevents your janitorial staff from cleaning unused rooms.
- 10** → **Create an IAQ dashboard for operators and occupants alike**
It's now possible to create real-time dashboards that visualize current IAQ and occupancy. The dashboard can appear in your lobby, on your operator's devices, and even on a mobile app. That transparency bolsters confidence among occupants that the building is actively monitoring IAQ and occupancy. [The advisory software that makes this possible](#) can integrate with existing third-party equipment.
- 11** → **Perform metering for main building electric, water, and gas**
Why wait to see how much energy you've used until the bill arrives? With [real-time metering](#) in place, you can receive alerts when you risk exceeding your baseline — a situation that can lead your utility to charge something called ratchet demand cost penalties. Some building owners end up paying more for these penalties than their wn.
- 12** → **Optimize your central plant**
To save the most energy, go to where your building uses the most energy: the central plant. There are many strategies to optimize energy use here, from resetting chilled water setpoints to programming variable speed flows. Consider how running your systems for partial occupancy may differ from full occupancy and adjust accordingly.



The big-ticket items

- 13** → **Modernize your BMS**
Today's advanced BMSs give you much more visibility and control over your building's conditions than legacy systems. Not only are these modern BMSs likely to have more rigorous cybersecurity protection, they also enable sophisticated capabilities when it comes to IAQ monitoring and energy efficiency. Modernizing your BMS isn't a big expense when implementing alternative funding options such as a service and modernization plan, energy credits, and performance contracting.
- 14** → **Don't just meter — submeter**
Energy efficiency doesn't just include electricity. Consider your other utilities — gas, water, and steam. Submetering these can help you detect anomalies and faults across all the resources your buildings use. These meters can feed data to [cloud analytics and edge control](#), giving you unprecedented visibility and control into the way your building uses energy.
- 15** → **Upgrade to high-efficiency HVAC equipment**
There's never been a better time to invest in HVAC system improvements and BMSs for commercial buildings. Pandemic stimulus legislation from 2020 offers a major tax incentive for upgrading HVAC and other building systems. That can help drive a faster ROI for upgrades to older, inefficient chiller and boiler systems.

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