



OPTIMISTIC OUTLOOK PODCAST | EPISODE TRANSCRIPT

“The Hidden Health Challenge Inside Buildings”

Featuring:

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Description: Most of us spend up to 90% of our lives indoors—but how often do we think about the air we’re breathing inside buildings?

Indoor air quality plays a critical role in human health, especially in places like hospitals, schools, and offices where airborne pathogens and contaminants can spread quickly. Yet for decades, building systems have relied on static approaches like basic ventilation and filtration.

That’s starting to change.

In this episode of *The Optimistic Outlook In Five*, guest host Lauren Espin explores how a groundbreaking initiative called BREATHE is transforming the future of healthy buildings. By combining biosensors, real-time risk assessment software, and advanced building automation, this program aims to reduce respiratory disease transmission by at least 25%.

Siemens is helping lead this shift, integrating digital twin technology and AI-driven building controls to create environments that can detect airborne threats and respond instantly, adjusting airflow, filtration, and disinfection in real time.

The result? Buildings that don’t just monitor air quality, but actively predict, adapt, and protect human health.

Conversation: I'm Lauren Espin, and this is The Optimistic Outlook In Five, a quick update about an important development that will change the future.

Most of us spend ninety percent of our lives inside buildings yet few of us think about the air we breathe when we're in them.

Not the air outside or the pollution we can see. I'm talking about the air indoors, in hospitals, schools, offices, emergency rooms -- spaces that are basically sealed off from the outside and creating their own closed environment.

That air can carry airborne pathogens, allergens, and other contaminants that can affect respiratory health.

And for decades, managing indoor air has often relied on relatively static approaches to managing these contaminants -- like basic filtration and ventilation.

That's about to change.

The Advanced Research Projects Agency for Health, ARPA-H, has launched a program called BREATHE, a multi-year initiative that aims to lead a fundamental shift in how buildings manage indoor air

The goal? Reduce respiratory disease incidence by at least twenty-five percent.

This is an ambitious effort, and Siemens is participating in two of the program's projects.

The BREATHE program has three technical areas: biosensors that detect threats in the air, software that assesses respiratory risk in real time, and building controls that can actually do something about it. Siemens is playing a pivotal role in the second and third, integrating risk assessment models with advanced building automation so that when a threat is detected, the building itself responds.

This happens automatically in real time, and the exact response is perfectly calibrated - whether it's extra ventilation for fresh air, filtration of the indoor air, or disinfection of pathogens. It happens before people get sick and faster than humans can respond.

The engine driving all of this is digital twin technology.

A digital twin can create a virtual replica of a physical space, like a hospital ward, an emergency department, or an entire building. The digital twin models airflow, temperature, occupancy, and energy use all at once. It lets users simulate how a building will respond to an airborne threat before that threat ever appears so that the system is ready when it does. The digital twin allows us to test the interventions virtually, optimize the response, and then deploy it in the real world with confidence.

Siemens is contributing to two BREATHE projects right now. One is led by the Mayo Clinic, focused on emergency departments, combining biosensors, artificial intelligence, and smart air filtration. The other is led by SafeTraces, building a closed-loop, real-time risk assessment system for the Defense Health Agency's hospital network. Field trials are being conducted across multiple U.S. cities, in the kind of critical infrastructure where indoor air quality isn't a comfort issue, it's a life-or-death issue.

What makes this different from a typical air quality project is the closed loop.

In BREATHE, sensors detect issues in the air, software assesses the threat and formulates the best response, and the building responds. Each time, the digital twin learns from every cycle, getting smarter about how to protect the people inside.

The future of healthy buildings isn't only about measuring air quality better. It's about buildings that think, predict, and protect on their own.

I'm Lauren Espin, and this is The Optimistic Outlook.